REPUBLIC OF INDONESIA

MINISTRY OF PUBLIC WORKS AND ELECTRIC POWER

DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT

HYDROLOGICAL DATA AND SOME ANALYSIS ON CENTRAL SOUTH SULAWESI WATER RESOURCES DEVELOPMENT PROJECT

MARCH 1977

JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

The Government of the Republic of Indonesia made a request to the Japanese Government for a despatch of Japanese hydrologists for the purpose of a basic survey in regard to the Proposed Water Resources Development Project in the Central South Sulawesi.

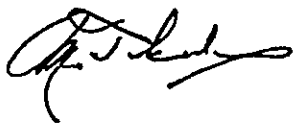
Realizing that to comply with the above-mentioned request will perform an important role in water resources development of Indonesia, we have despatched two hydrological experts, Mr.Yoshiaki Tsukamoto, International Co-operation Section, Planning Bureau, Ministry of Construction, and Mr.Makoto Migita, CTI Engineering Co., Ltd. to Indonesia during the period between February and August, 1976.

During the time of our field reconnaissance, officials and engineers of the Government of Indonesia kindly lent us their full co-operation, and as the result, we were able to collect valuable data to be utilized as basic information for the water resources development of the Central South Sulawesi. Now we are ready to present a report of the findings of our survey.

We most sincerely hope that the report will contribute largely to the economical development of the Republic of Indonesia and further promote international friendship and good will between the peoples of the two countries.

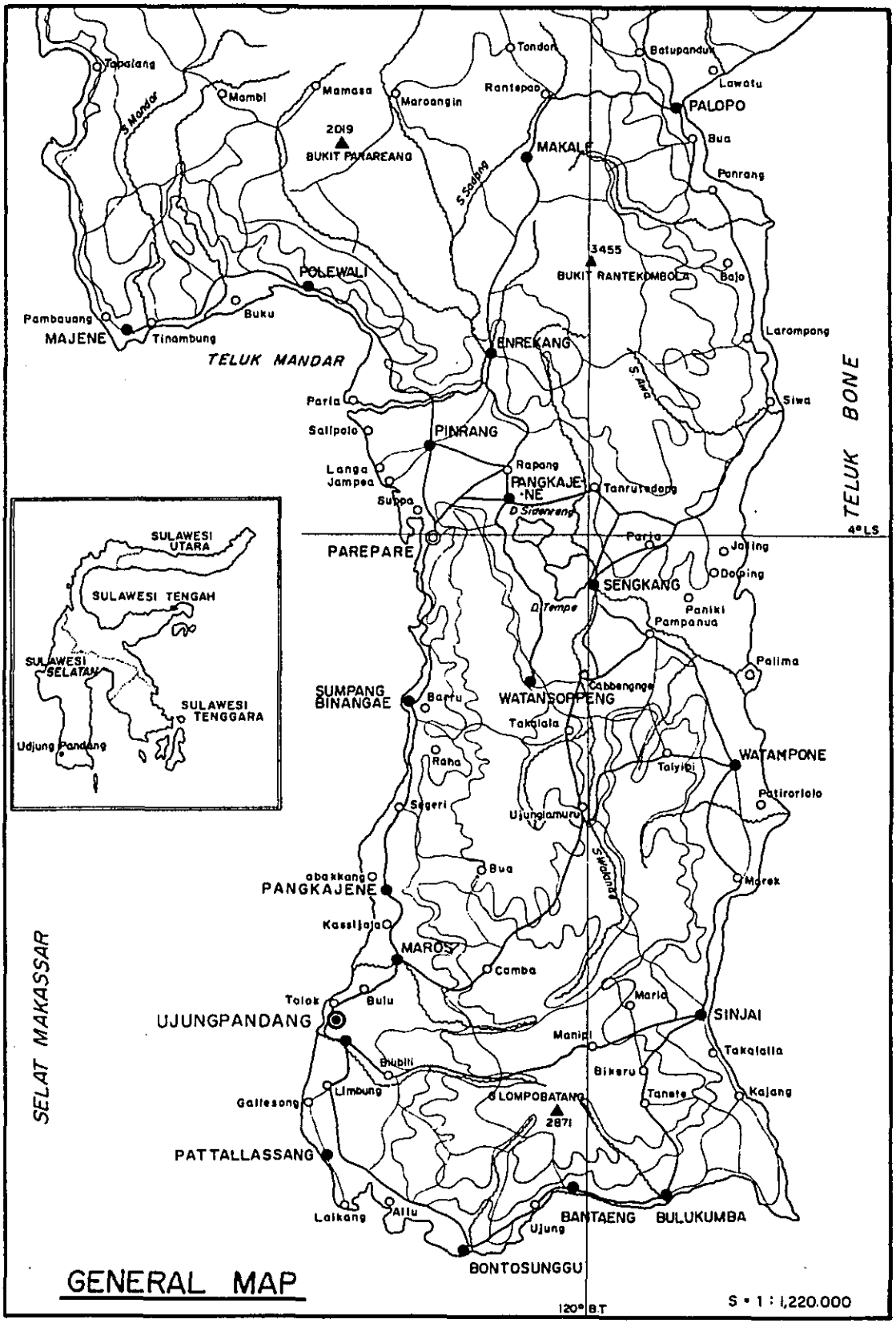
Last, but far from the least, we wish to express our deep appreciation to the executive officers of the Embassy of Japan, Djakarta, and other Government authorities in Indonesia for their kind and thoughtful co-operation all during our recent survey.

March, 1977



Michio Takeda

Head of Expert Assignment Department
Japan International Cooperation Agency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1. Introduction

1.1 Purpose of Survey

The purpose of this survey is to obtain basic data for preparation of a master plan by collecting hydrological data and making a survey which are required for formulation of the water resources development project for the peripheral areas of the Lake Tempe located in the center of South Sulawesi.

1.2 Background Information

The Government of the Republic of Indonesia is strongly inclined to promote the regional development policy in the Second five year Development Program, and the Central Sulawesi Water Resources Development Project constitutes a part of the above-mentioned project, and consequently, the Government of the Republic of Indonesia advanced to the Japanese Government a request for a technical assistance under the Technical Assistance List "BTA-33". The findings of the survey in 1969 for a fishery preservation of the Lake Tempe strongly emphasized the necessity for control of sediment load flowing into the Lake Tempe, and also the establishment of the overall development project in regard to the Bila-Sidenreng-Tempe-Walanae-Cenranae Water Resources System, are the reason why this project was proposed. In 1973, recommendation in regard to the basic development of the area was presented by the two Japanese specialists of the survey team despatched by the Overseas Economic Cooperation Fund (OECF) for the Indonesian project. Then in May 1973, in regard to the survey conducted by the Japanese specialists, the Director General of the Water Resources Development DPUTL, the Republic of Indonesia came into contact with the Embassy of Japan in Djakarta to find out possibility of realization of a feasibility study. And further in June of the same year, the Embassy of Japan in Djakarta was advised that the Indonesian Government has earmarked the counter-Rupiah for the total amount of thirteen million for the proposed survey, that tempting offers for a positive assistance to the survey have been made by other countries, and that the Government of Indonesia wished to find out whether or not the Japanese Government would be interested in their participation in the project.

Taking the whole circumstances mentioned above into consideration, in February 1974, the Japanese Government despatched a 10-member survey team

headed by Mr.Seiichiro Nakamoto to the Republic of Indonesia. The survey team performed a preliminary survey, established a basic development concept, and recommended appropriate survey items for the Water Resources Development Project of the subject area. This report, as the preliminary for the execution of the "BTA-33", is a summary of the findings of the field survey, based on the recommendation of the above-mentioned preliminary (Collection of Hydrological Data obtained by the required survey for drawing-up of the Master Plan) and compiled in the form of a collection of hydrological data, by the two Japanese specialists in co-operation with the two Indonesian counterparts from the Government during the 6-month period between March and August 1976.

Survey items of the field investigation are: collection of hydrological observation data (rainfall and water-stage), field reconnaissance survey (catchment basin condition and preliminary survey of the discharge observation points), observation of discharge, survey of flood marks, and location and field survey of new observation station sites, etc.

Here, in this report, location of observation stations and places where those available data are preserved are made clear, and also, summary of the data collected and of the findings of the survey are included together with drawings and charts in a compact form.

1.3 Specialists Despatched

The below is the names of the Japanese specialists participated in the Water Resources Development Survey.

Mr.Yoshiaki Tsukamoto, International Cooperation Section, Planning Bureau, Ministry of Construction.

Mr.Makoto Migita, CTI Engineering Co., Ltd.

1.4 Itinerary

The below is the itinerary of the survey after arrival at Djakarta on February 27th, 1976.

ITINERARY OF THE SURVEY - 1976:

Date	Place	Description
February 27, Fri.	Djakarta	left Tokyo for Djakarta, Flight : JAL 711
28, Sat.	Djakarta	paid courtesy call to the Embassy of Japan, Djakarta and D.P.U.T.L
29, Sun.	Djakarta	prepared for the proposed survey
March 1, Mon.	Djakarta	received delivery of the equipment shipped by JAL-711
2, Tue. 3, Wed.	Bundung	visited the Institute of Hydrology, Bundung, purchased maps required for the survey
4, Thu.	Ujungpandang	moved to Ujungpandang from Bundung
5, Fri. 14, Sun.	Ujungpandang	held conference with DPUTSS and P3SA, received delivery of the equipment shipped by JAL-711, prepared for the scope of work for the first half of the period and for the field reconnaissance survey
15, Mon. 18, Thu.	Singkang Watansoppeng	conducted the first field reconnaissance survey, including checking-up of the observation equipment and location of flow observation points, etc.
19, Fri. April 16, Fri.	Ujungpandang	conducted the following: data collection, map making, preparation for monthly report, aerial survey of the catchment basin (April 14), preparation for the second field reconnaissance survey

April	17, Sat. 23, Fri.	Singkang	held the second field reconnaissance survey, including assembly and installation of flow discharge observation equipment, survey, preparation of floats, flow discharge observation, confirmation of the Mong Dam site, etc.
	24, Sat. 26, Mon.	Ujungpandang	put the data collected in order, made preparation for monthly report, collected rainfall data, etc.
	27, Tue.	Djakarta	reported the progress to the Embassy of Japan and JICA, held conference with DPUTL
	28, Wed. 29, Thu.	Bandung	collected water-stage data
	30, Fri.	Djakarta	held conference with DPUTL, visited the Department of Meteorology, Djakarta
May	1, Sat.	Djakarta	collected rainfall data at the Department of Meteorology
	2, Sun. 5, Wed.	Ujungpandang	put the data collected in order, prepared for the third field reconnaissance survey, etc.
	6, Thu. 13, Thu.	Singkang	held third field reconnaissance survey, including flow discharge observation, flood trace survey, testing of the float throwing equipment at Ujunglamuru, supplementary survey

May	14, Fri.	Ujungpandang	put the data collected in order, collected supplementary hydrological data, prepared
	22, Sat.		for the intermediate report, held conference with DPUTSS and P3SA, etc.
	23, Sun.	Djakarta	reported the progress to the Embassy of
	27, Thu		Japan and JICA, held conference with DPUTL
	28, Fri.	Ujungpandang	prepared for scope of work for the second half of the period, putting the data collected
June	7, Mon.		in order, prepared for the Fourth Field Reconnaissance Survey
	8, Tue.	Ujungpandang	had an official inspection by Director General of Water Resources Development, DPUTL.
	9, Wed	Singkang	held the Fourth Field Reconnaissance Survey, including flow discharge observa-
		Watansoppeng	tion, reconnaissance and field survey of the proposed observation station sites,
	19, Sat.	Watanpone	flood trace survey
	20, Sun.	Ujungpandang	checked up the survey records, held conference on preparation of the primary plan
July	8, Thu.		for the proposed observation stations, put the data collected in order, etc.
	9, Fri.	Djakarta	held conference in regard to receiving delivery of equipment (second shipment), held conference with DPUTL.
	20, Sun.		collected data at Department of Meteorology, Djakarta, received delivery of the equipment (second shipment), prepared for trans-shipment to Ujungpandang of the

			equipment, held conference with the Embassy of Japan and JICA, etc.
	21, Wed. 22, Thu.	Ujungpandang	received delivery and checked up the equipment, prepared for the Fifth Field Reconnaissance Survey
	23, Fri. 30, Fri.	Singkang Watansoppeng Watanpone	held the Fifth Field Reconnaissance Survey, including flow discharge observation, location survey of the proposed observation station sites
August	31, Sat. 3, Tue.	Ujungpandang	checked up the survey records, collected and put in order of the supplementary data, prepared for the Sixth Field Reconnaissance Survey
	4, Wed. 11, Wed.	Singkang	held the Sixth Field Reconnaissance Survey, including flow discharge observation and supplementary survey
	12, Thu. 23, Mon.	Ujungpandang	checked up the survey records, prepared for the intermediate report, put the data collected in order
	24, Tue. 26, Thu.	Djakarta	reported the progress to the Embassy of Japan and JICA, visited the Indonesian Government authorities concerned for reporting and explanation, prepared for the homeward trip
	27, Fri.	Djakarta	visited the Embassy of Japan, JICA and DPUTL to extend parting greetings, shipped the equipment back to Japan
	28, Sat.	Djakarta	left Djakarta for Tokyo, Flight : JAL 712

1.5 Acknowledgement and List of Participating Officials and Engineers

Here again, we are gratefully acknowledge our indebtdness to all the participating Government officials and engineers, for their close co-operation during our stay in Indonesia.

The following is the major names.

1) Counterparts

Ir. Syamsul Arida,

Directorate of Water Resources Development, P3SA, South Sulawesi

Mr. Pabundu Tika,

Directorate of Planning and Programing

Mr. Hilman Kosasih,

Directorate of Planning and Programing

2) Japanese Specialists

Mr. Sei Nagao,

Directorate of Rivers and Swamps, DGWRD

Mr. Masayuki Watanabe,

Directorate of Rivers and Swamps, DGWRD

Mr. Mitsuo Nakahiro,

Directorate of Rivers and Swamps, DGWRD

3) Central Government

Ir. Sujono Sosrodarsono,

Director General of Water Resources, DPUTL

Ir. Boesono Boedidarmo,

Director of Planning and Programing

Ir. Sudaryoko,

Director of Rivers and Swamps

Ir. Mardjono,

Chief of Service, Directorate of Planning

Ir. Kusdarjono,

Chief of River Development Service,

Directorate of Rivers and Swamps

Ir. Kuncoro Jakti,

Directorate of Planning and Programing, DGWRD

Ir. Suharto,

Institute of Hydrology, Bandung

Drs. Attamimi,

Directorate of Planning and Programing

Mr. Azis Booking,

– ditto –

Mr. Jusuf Kardi M.S.C.,

– ditto –

Ir. Amir Murjadi,

– ditto –

Drs. Planoto,

– ditto –

Ir. Sudiyanto,

– ditto –

Mr. Kaul,

– ditto –

4) Local Government

Ir. Lateko Tjambolang,

Chief of Public Works (PU), South Sulawesi

Mr. Suratman B.I.E.,

Chief of Water Resources Section, (PU), South Sulawesi

Mr. A.P. Ridwan,

Water Resources Section (P3SA), South Sulawesi

Mr. Asape,

Public Works Office, Kabupaten Wajo

2. Hydrological Data

2.1 Current Network of Hydrological Observation Stations

The object survey area is located at the center of South Sulawesi, lat. 3°3' South - lat. 4°50' South and long. 119°40' - 120°20' East, as shown in the location map. Hydrological characteristics of the basin is rather complicated one. The major river system, the Lake Tempe as the center, consists of the Walanae River and Bila River both of which are flowing into the Lake Tempe and the Cenranae River which flows into the Gulf of Bone from the Lake Tempe, and the total area of the catchment basin reaches to about 7,700 sq.km. Administatively, the basin belongs to Wajo and Soppen Prefectures, and a part of the neighbouring prefectures of Sidrap and Bone where the Lake Tempe, Walanae, Bila and Cenranae Rivers are found.

The Walanae River flows from the south and the Bila River and other small rivers flow from the north. These two river systems meet at the Lake Tempe, then flow into the Cenranae River which drains to the Gulf of Bone of the east. In the two systems, period of rainy seasons and characteristics of the topography are a little different between north and south of the area.

The Project area is divided into six river catchment basins as mentioned below and the current observation net-work of rain-gauge stations and water-stage observation stations are shown in Fig.1.

a. Bila River Basin
b. Cenranae River Basin
c. Walanae River Basin (Upstream)
d. Walanae River Basin (Downstream)
e. Lake Tempe Basin
f. Gilirang River Basin

2.2 Hydrological Observation Stations and Present Condition on Accessible Data

The hydrological data of the observation stations shown in Fig.1 and the present condition of their accessible observation data in the period of 1962 through 1975 are presented on Table 1.

According to the table, there are total of 51 rain-gauge stations (five automatic type and forty-six standard type rain-gauge stations) and 27 water-stage observation stations (eight automatic type and nineteen standard type

water-stage observation stations). These observation stations are under the superintend of the five administrations mentioned below.

a.	P3SA	:	Proyek Perancangan & Pengembangan Sumber-Sumber Air
b.	PMA	:	Penyelidikan Masalah Air
c.	DPMA	:	Direktorat Penyelidikan Masalah Air
d.	PMG	:	Pusat Meteolologi & Geofisika
e.	DIPERTA	:	Dinas Pertanian

In Table 1, some observation stations where short in coverage of their observation data are found when dates of their establishment are considered. This is because they were not found in the record files at the above-mentioned five administrative offices at Ujung Pandang, and the weather bureau at Djakarta. In this time survey, therefore, it was unable to trace and confirm whereabout of the missing original observation data of the respective stations and the bureau. Among observation stations founded before the World War II, Maroanging, Pampanua, Palima, Kappang, Camming, Biloka & Alakuang are still suspended from operation but most of others are in continuous operation or already re-opened. Details of monthly and daily rainfall data existing condition are shown in Table 2.

2.3 Monthly Rainfall Data.

Rainfall data are arranged annually by the month in each of the above-mentioned administration. Table 3 is the result rearranged (Year 1975 as a sample) all of these monthly rainfall records for each river system. Referring to the results rearranged, there are not enough observation data available in the period from 1962 to 1975. In fact, out of these 51 rain-gauge stations, less than half has actually been operating in the past 14 years. It is, therefore, necessary to collect further rainfall data of the past and also to follow up rainfall observation constantly in each rain-gauge station including the stations installed recently. A compilation of an annual rainfall data - 1975 - is shown in Table 3 as a sample.

Where,

–	:	No rain
×	:	No record (No information or gauge trouble)

In the Table, the upper column shows monthly rainfall and the lower shows number of rainfall days.

2.4 Daily Rainfall Data

Table 4 shows an example of annual observation data of daily rainfall recorded at rain-gauge stations, such as Takalala, Watan Soppeng, Sing Kang (2), Tanru Tedong (2), Watan Pone where observation data are relatively complete.

Legends of Table 4 are as below;

- ; No rain
/ ; No record (No information or gauge trouble)

Table 5 shows annual maximum daily rainfall picked up from observation data of the above-mentioned rain-gauge stations. According to the table, an annual maximum daily rainfall is observed almost during the months of March through August so-called rainy season, however, observations of date of occurrence and amount of rainfall among the above-mentioned stations show no special co-ordinative tendencies in the data obtained at the different stations. Especially, no tendency toward common behavior in time of occurrence as well as amount of rainfall is observed even among such closely located rain-gauge stations as Takalala, Watan Soppeng. Observation values of rainfall obtained at Sing Kang which is located in near center of the catchment area, are a shade lower than those obtained at other stations.

The foregoing facts may have to be taken into consideration in future on such works as run-off analysis, establishment of design flood discharge, etc. Besides quantative and regional distribution of rainfall as mentioned above, hourly distribution data of rainfall will also become necessary and important in the process of run-off analysis. In regard to hourly distribution of rainfall, a certain degree of analysis has been performed in "3.2", based on limited data on hourly distribution of rainfall. However, observation of hourly rainfall by automatic rain-gauges was commenced only since 1975, estimation of amount and intensity of rainfall may only be computed from available daily rainfall data.

2.5 Daily Water Stage Data

Water-stage observations of the rivers in the subject area, were first started with a staff-gauge installation at the Lake Tempe, and at present there

Table 5 Annual Maximum Daily Rainfall

Year	Takalala		Watan Soppeng		Singkang (2)		Tauru Tedong(2)		Watan Pone	
	Date	R(mm)	Date	R(mm)	Date	R(mm)	Date	R(mm)	Date	R(mm)
1975	4 Jul.	52	4 Oct.	84			11 Aug.	126		
1974	23 May	86	4 Apr.	83			9 Sep.	128	1 Oct.	117
1973	22 Nov.	125	15 Feb.	86			6 Apr.	110	24 Sep.	97
1972	22 Apr.	51	8 Jan.	53			5 Mar.	84	18 Aug.	67
1971	1 May	49	28 Aug.	85	19 Nov.	64	1 Oct.	75	16 Jun.	125
1970	12 Mar.	71	29 Apr.	94	19 Sep.	106			15 May	98
1969	17 Mar.	150	19 Dec.	40	18 Aug.	83			30 Mar.	115
1968	26 Jul.	95	20 Mar.	232	21 Oct.	85			25 Jul.	137
1967	22 Jul.	252	6 Oct.	65	26 Mar.	90			30 Mar.	48
1966	3 Feb.	92	24 Feb.	60	17 Apr.	98			24 May	160
1965	10 May	63	10 May	60	10 May	72			25 Apr.	92
1964	27 Dec.	75	1 Apr.	122	2 Oct.	81			3 Aug.	90
1963	10 May	68	27 Jan.	90	7 May	45			7 May	140
1962	26 Jan.	50	30 Nov.	150	23 Jan.	72				
1961	7 Apr.	129	19 Apr.	90	20 Apr.	59				
1960	11 Jul.	75	19 Apr.	140	6 Jun.	128				

are nineteen ordinary and eight automatic water-stage observation stations in the area. According to the findings of the recent reconnaissance of the eight automatic stations, an appropriate maintenance of the apparatus is recommended especially at the Solo station in the Cenranae River basin, where the apparatus is almost out of order because of an excessive silted deposit. The staff gauge at Tempe which was reinstalled by P3SA in 1975 after Laringgi staff gauge had been washed away, and the staff gauge at Tg. Pallette, etc., read off of the gauges was found difficult because gauges are so rusted. At Buru Cenrana Observation Station, the water-stage was often found far below point zero of the gauge and the river bed was exposed. For continuation of observation in the future, such maintenance problems including repair and relocation of the apparatus for uninterrupted observation are to be taken fully into consideration.

Also, the Cenranae River improvements will be given a major consideration in the course of foundation of the master plan, and tidal-gauge records at Tg. Pallette will be regarded as one of the boundary conditions in estuary improvement problems. Through a reconnaissance by a P3SA motor boat of the Lake Tempe, it was found that the velocity of natural water flow of the lake seemed relatively high. It is especially regarded that the river which is one of the netted rivers developed around the outlet of the Lake Tempe to the Cenranae River where the P3SA's staff gauge was installed shared the river course with the Bila River in the long past judging from the topographical and the water flow characteristics of the lake. The river bed around the confluence of the Walanae and Cenranae Rivers is considerably scoured, and the area is mostly low and marshy. It is said that flow of the Walanae River at the time of floods is not always directed to the Lake Tempe. The direction of flow is likely to depend on the water-stage of the lake at the time of floods. A successful river improvement of the confluent area is one of the major problems of the proposed flood prevention project. Because of apparatus trouble for water depth mesurment, observation of the Lake Tempe was limited in reconnaissance. Findings include that maximum normal water depth of the lake is about 3 meters and the bottom of the lake is uniformly covered with a deposit of fine silty load. Though the cause of deposit may have to be clarified by a future observation, the

deposit is appeared to be a wash load from the upstream consisting of a fine silt which is entirely different from the river bed sand. These problems are to be further investigated together with the bank erosion. Present condition of accessible water-stage data is listed in Table 6 and water-stage observation data of these stations are shown in Fig.2.

Where, Legends in Table 6 are as below:

/ No data (no information or gauge trouble)

△ Data, partially available

○ Data, available

* Seems to be available but not formally arranged yet.

2.6 Comparative Relation between Monthly Rainfall and Daily Water-stage

It is merely two observation stations, Tempe Station and Lakibong Station, that daily water-stage has been observed continuously over a long period. Tempe Station was in operation from 1968 to 1972, and Lakibong Station is from 1970 to 1972. Daily water-stage hydrograph is rearranged correspondingly with the monthly rainfall from 1968 to 1972 on the scaled map of 1/500,000. Through the same method as above, comparative relations between monthly rainfall and water-stage from 1973 to 1975 were rearranged by using the record obtained at automatical water-gauge station installed recently. Fig.3 shows data for 1975 as a sample.

By referring to this figure, it is possible to grasp comparative correlation among monthly rainfall, run-off from the Walanae River basin and water-stage fluctuation of the Lake Tempe..

2.7 Main Floods Hydrograph in 1974 and 1975

Automatic water-stage observation stations in each river system are mentioned below.

Bila River	Bila, Tanru Tedong
Cenranae River	Singkang, Solo
Walanae River	Sanrego, Ujung Lamuru
	Langkemme, Cabbenge

Almost all of these observation stations were installed in 1974 or 1975. Table 7 is the list of main flood according to the automatic water-stage record and Fig.4 shows the hydrograph obtained at automatic observation stations in river systems which experienced floods in these two years. The above-mentioned tables and figures may be fully utilized in run-off analysis and design flood discharge computation. As to the existing condition of the observation stations through the recent reconnaissance, it was found that such stations as Bila, Tanru Tedong, Sing Kang and Ujung Lamuru present no problem but the water-gauge at Solo was found out-of-order due to an excessive sediment deposit. As mentioned before, there is a weir consisting of cobble stones downstream of the gauge point of the Lang Kemme, and back water from the weir almost reaches up to the gauging point. In regard to Cabbenge observation station, at present there are no problem to solve but an appreciable breaking is observed on the right embankment where the gauge is installed, therefore, some counter-measures may have to be worked out.

2.8 Flood Mark Survey

Flood mark survey is important as hydraulic data and can be used to understand flood flow condition and to make water-stage discharge curve successfully. Flood mark was surveyed two times at Cabbenge as shown in Fig.5.

The "Bridge" in the Fig.5 is a road bridge between Sing Kang and Ujung Pandang. TBM1 is the temporary bench mark installed on the concrete abutment at the left bank side of this road bridge. Also, TBM2 means a temporary bench mark specially installed for the purpose of flood mark survey. And WG means the elevation of the lowest step of the front stairs of the gauge-stations. B.M is the Bench Mark constructed of concrete at right bank side. Their respective elevations are as follows.

TBM1	=	10.990 meters
TBM2	=	8.575 "
WG	=	8.490 "
B.M	=	8.900 "

2.9 Discharge Observation and Water-Stage Discharge Curve

Discharge observation was performed at eight places, principally at Sing Kang, Cabbenge, Ujung Lamuru and Tanru Tedong, and also at Lakibong, Bila, Solo and Lang Kemme.

Cross sections of the above-mentioned stations are shown in Fig.6. As to measurement, Price Type Current Meter (No.525) was used where water-level is relatively low, and Bamboo Floats were used where the level is high. Measurement of flow velocity by current meter is obtained by the one-point method in which velocity of flow is measured at one pre-determined point 60% of the total depth from water level. Conversion of flow velocity was performed by the formula given below.

$$V = 0.709\ No + 0.019$$

Where

V = Mean Velocity (m/s)

No = Number of "Price" revolution per second.

For measurement of flow velocity at Sing Kang, Cabbenge, Ujung Lamuru and Tanru Tedong, four different bamboo floats, 2.0, 1.5, 1.0 and 0.5 meters in length were used. All floats were pre-calibrated as per Fig.7. The cross section of the observation points was divided into four longitudinal lanes in parallel to the direction of the flow. Measurements by bamboo float were performed three times, at least, at throw points of each lane in the upstream of the test section. Required flow velocity was computed from the mean values of three actual measurements. And compensation factors applied for the float is shown in Fig.7. Flow discharge observation data thus obtained are shown in Fig.8. According to Fig.8, observation data are almost limited to the lower. range of water-stage and it is necessary to observe high-water discharge by using the bamboo float at the observation points, Tanru Tedong, Sing Kang, Cabbenge and Ujung Lamuru, where high-water discharge observation facilities have already been installed. It is also desirable to observe high-water discharge at Lakibong and Solo where necessary observation facilities have not been installed yet. If it is difficult to prepare the facilities, it is still possible to estimate the approximate flood discharge by flood mark survey of water-stage

gradient. In a comparison between observation values obtained by the bamboo float method (marked "O") and ones by the current meter method (marked " ● "), it is observed that values obtained by the two methods show quite obvious similarities. These figures prove practical usefulness of the bamboo float method. It is recommended to prepare water-stage discharge curves by performing periodical flow discharge observation in future, especially taking higher water-stages of flow into consideration. Since the practical computation method of water-stage discharge curves by the method of least squares is more and more widely adopted.

Table 9 Example of Water Stage Discharge Curve Calculation

Observation Data at Ujung Lamuru

No	Date	H	Q	H^2	$\sqrt{Q}$	$H \cdot \sqrt{Q}$
1	18 Jul. 1975	1.38	112.66	1.904	10.614	14.647
2	14 Sep. "	1.16	69.79	1.346	8.354	9.691
3	29 Sep. "	0.62	24.36	0.384	4.936	3.060
4	22 Oct. "	1.16	69.12	1.346	8.314	9.644
5	5 Dec. "	1.28	55.83	1.638	7.472	9.564
6	26 Dec. "	0.87	43.175	0.757	6.571	5.717
7	3 Feb. 1976	1.65	121.224	2.723	11.010	18.167
8	13 May "	0.91	49.950	0.828	7.068	6.432
9	17 Jun. "	0.80	32.061	0.64	5.662	4.530
10	23 Apr. "	0.60	37.624	0.36	6.134	3.680
11	28 Jul. "	0.52	12.336	0.270	3.512	1.826
12	28 Jul. "	0.52	14.914	0.270	3.862	2.008
13	7 Aug. "	0.52	15.447	0.270	3.930	2.044
Σ		11.99	658.491	12.736	87.439	91.010

Where,

H : Water Stage (m) Q : Discharge (m^3/s)

From the calculation result mentioned above, Water Stage discharge curve is obtained by following procedure.

Calculation of Water Stage Discharge Curve

$n\left[H\sqrt{Q}\right] = 13 \times 91.01 = 1183.13$

$\left[H\right]\left[\sqrt{Q}\right] = 11.99 \times 87.439 = 1048.394$

$n\left[H^2\right] = 13 \times 12.736 = 165.568$

$\left[H\right]^2 = 11.99^2 = 143.760$

$\left[H^2\right]\left[\sqrt{Q}\right] = 12.736 \times 87.439 = 1113.623$

$\left[H\right]\left[H\sqrt{Q}\right] = 11.99 \times 91.01 = 1091.210$

$$a = \frac{n\left[H\sqrt{Q}\right] - \left[H\right]\left[\sqrt{Q}\right]}{n\left[H^2\right] - \left[H\right]^2} = \frac{1183.13 - 1048.394}{165.568 - 143.760} = \frac{134.736}{21.808} = 6.178$$

$$b = \frac{\left[H^2\right]\left[\sqrt{Q}\right] - \left[H\right]\left[H\sqrt{Q}\right]}{n\left[H^2\right] - \left[H\right]^2} = \frac{1113.623 - 1091.210}{165.568 - 143.760} = \frac{22.413}{21.808} = 1.028$$

$a^2 = 6.178^2 = 38.168$

$b/a = 1.028/6.178 = 0.166$

$$Q = a^2 (H \pm b/a)^2 = 38.168 (H \pm 0.166)^2$$

Table 9 shows the example of water-stage discharge curve calculation based on the existing observation records at Ujung Lamuru. When more data are gathered, the same procedures will be repeated. Relations between water-stage and flow discharge will be varied with changes in river bed. The relation obtained may have to be changed accordingly.

Fig. I CURRENT NET WORK OF HYDROLOGICAL OBSERVATION STATIONS

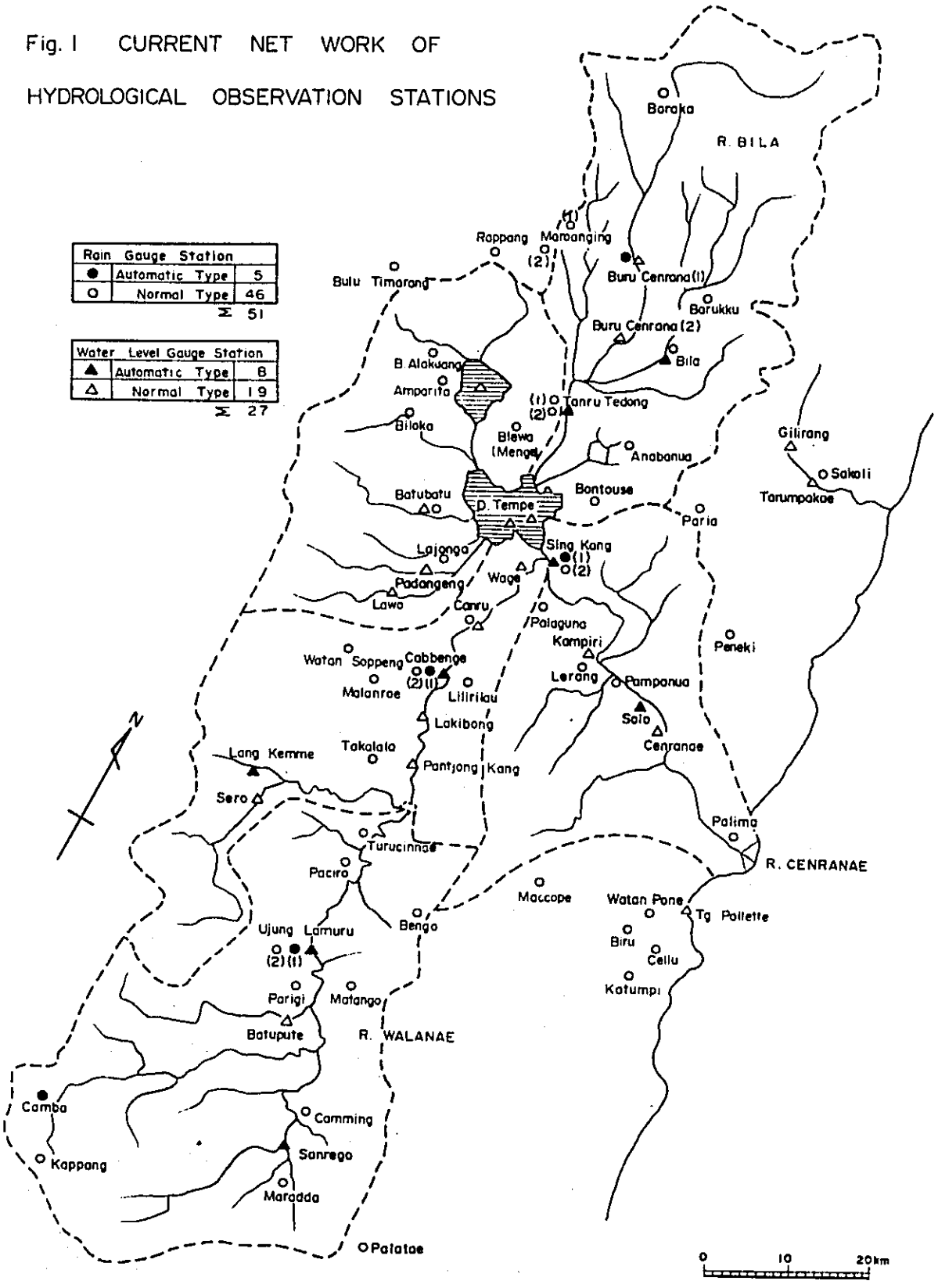


Table I-1 HYDROLOGICAL OBSERVATION STATIONS & PRESENT CONDITION ON ACCESSIBLE DATA

Location		Observation Station Name				Belonging	Data Exisiting Condition		Remarks
		Rainfall		Water Level					
River System	River Name	Automatic	Normal	Automatic	Normal		Settig Year	19__ 62 64 66 68 70 72 74	
Bila									
	Boya								
			Baraka			P_3 S A	Dec. 1973	XXXXXXXXXXXXXOO	Daily : 1974 ~ 1975
		Buru Cenrana				"	May 1974	XXXXXXXXXXXXXOO	Daily : 1974 ~ 1975
			Maroanging (1)			P. M. G	1930	XXXXXXXXXXXXXXX	
			Maroanging (2)			P. M. A	(Indifinite)	XXXXXXXXXXXXXXX	
					Buru Cenrana (1)	P_3 S A	Oct. 1975	XXXXXXXXXXXXXXX	
					Buru Cenrana (2)	"	"	XXXXXXXXXXXXXOO	
	Bila								
			Barukku			P_3 S A	Sep. 1975	XXXXXXXXXXXXXOO	Daily ; 1975
			Bila			P. M.A	Nov. 1974	XXXXXXXXXXXXXOO	Daily ; 〃
			Tanru Tedong (1)			"	"	XXXXXXXXXXXXXOO	Daily ; 〃
			Tanru Tedong (2)			DIPERTA	1930	XXXXXXXXOOOOOOO	Daily : 1971 ~ 1975
			Anabanua			"	1925	OOOOOOOXOXXXXXX	Daily : 1962~1968,70
			Bontouse			"	1930	OOOOOOXOOOOXXXO	Daily ; 1962~67,70-72
				Bila		P. M. A	Apr. 1973	XXXXXXXXXXXOOOO	
				Tanru Tedong		P_3 S A	Mar. 1974	XXXXXXXXXXXXXOO	
Cenranae									
	Cenranae								
		Sing Kang (1)				P_3 S A	May 1974	XXXXXXXXXXXXXOO	Daily : 1974 ~ 1975
			Sing Kang (2)			DIPERTA	1909	OOOOOOOOOOOXXXX	Daily ; 1962 ~ 1972
			Palaguna			"	1926	XOOOOOOOOOOOOOO	Daily ; 1968-70, 72-74
			Lerang			"	1937	XXXXXXXXOOOOOOO	Daily : 1971 ~ 1975
			Pampanua			P. M. G.	1906	XXXXXXXXXXXXXXX	
			Palima			"	1918	XXXXXXXXXXXXXXX	
			Maccope			DIPERTA	1937	OOOOXOOOOOOOOOO	Daily : 1962-65, 67-75
			Watanpone			"	1906	XOOOOOOOOOOOOOO	Daily ; 1963 ~ 1974
			Biru			"	(Indifinite)	XXXXXXOOXXOOOOO	Daily ; 1968-69, 72-75
			Cellu			"	(〃)	OOOOOXOOOOOOOOO	Daily ; 1962-65, 67-75
			Katumpi			"	(〃)	XXXXXOOOOOOOOOO	Daily ; 1968 ~ 1975
					Kampiri	P_3 S A	July 1975	XXXXXXXXXXXXXXO	
				Solo		"	Feb. 1976	XXXXXXXXXXXXXXX	
					Cenranae	"	July 1975	XXXXXXXXXXXXXXO	
					Tg. Pallette	"	〃	XXXXXXXXXXXXXXO	
				Sing Kang		DPMA	Oct. 1974	XXXXXXXXXXXXXOO	
Walanae									
	Minraleng								
			Kappang			P. M. G.	1919	XXXXXXXXXXXXXXX	

Table I-2 HYDROLOGICAL OBSERVATION STATIONS & PRESENT CONDITION ON ACCESSIBLE DATA

Location		Observation Station Name				Belonging	Data Existing Condition		Remarks
		Rainfall		Water Level			Setting Year	19— 62 64 66 68 70 72 74	
River System	River Name	Automatic	Normal	Automatic	Normal				
		Camba				P3 SA	May 1974	XXXXXXXXXXXXXOO	Daily ; 1974-1975
	Sanrego								
			Maradda			DIPERTA	May 1971	XXXXXXXXXOOOOOO	Daily ; 1971-1975
			Palatae			P. M. A	June 1974	XXXXXXXXXXXXXOO	Daily ; 1974-1975
			Camming			P. M. G	1928	XXXXXXXXXXXXXXX	
				Sanrego		D. M. A	Apr. 1973	XXXXXXXXXXXOOO	
	Batupute								
			Parigi				May 1975	XXXXXXXXXXXXXO	Daily ; 1975
					Batupute	P3 SA	July 1975	XXXXXXXXXXXXXO	
	Walanae								
	(upper part)		Matango			P3 SA	May 1975	XXXXXXXXXXXXXO	Daily ; 1975
		Ujung Lamuru (1)				"	Mar. 1974	XXXXXXXXXXXXOO	Daily ; 1974-1975
			Ujung Lamuru (2)			P. M. A.	1914	XXXXXXXXXXXXXX	
			Bengo			DIPERTA	May 1971	XXXXXXXXXOOOOOO	Daily ; 1971-1975
			Paciro			P3 S A	May 1975	XXXXXXXXXXXXXO	Daily ; 1975
			Turucinnge			"	May 1975	XXXXXXXXXXXXXO	Daily ; 1975
				Ujung Lamuru		"	Apr. 1974	XXXXXXXXXXXXOO	
	Mario								
				Lang Kemme		P. M. A	July 1974	XXXXXXXXXXXXOO	
					Sero	P3 S A	July 1975	XXXXXXXXXXXXXO	
	Walanae								
	(Lower part)		Takalala			DIPERTA	1928	OOOOOOOOOOOOOOO	Daily ; 1962-1975
			Lilirilau			"	Apr. 1971	XXXXXXXXXOOOOXX	
			Malanrae			"	Sep. 1972	XXXXXXXXXOOOOOO	Daily ; 1972-1975
			Watan Soppeng			"	1906	OOOOOOOOOOOOOOO	Daily ; 1962-1975
		Cabbenge (1)				P3 S A	May 1974	XXXXXXXXXXXXOO	Daily ; 1974-1975
			Cabbenge (2)			DIPERTA	June 1971	XXXXXXXXXOOOOOO	Daily ; 1971-1974
			Canru			"	1953	OOOOOOOOOOOOOOO	Daily ; 1962-1975
					Pantjong Kang	P3 S A	Sep. 1975	XXXXXXXXXXXXXXO	
					Lakibong		Aug. 1970	XXXXXXXXOOOOXXO	
				Cabbenge		DPMA	Oct. 1974	XXXXXXXXXXXXOOO	
					Canru	P3 S A	July 1975	XXXXXXXXXXXXXXX	
					Wage	"	July 1975	XXXXXXXXXXXXXXO	
Around D.Tempe									
	Lawo								
					Lawo	P3 S A	July 1975	XXXXXXXXXXXXXXO	
					Padangeng		July 1975	XXXXXXXXXXXXXXX	
			Lajanga			DIPERTA	May 1971	XXXXXXXXXOOOXXO	

Table I-3 HYDROLOGICAL OBSERVATION STATIONS & PRESENT CONDITION ON ACCESSIBLE DATA

Location		Observation Station Name				Belonging	Data Existing Condition		Remarks
		Rainfall		Water Level					
River System	River Name	Automatic	Normal	Automatic	Normal		Setting Year	19__ 62 64 66 68 70 72 74	
	Batubatu								
			Batubatu			DIPERTA	1928	OOOOOOOXXXOOOO	Daily ; 1962-67,73-75
					Batubatu	P3 SA	June 1975	XXXXXXXXXXXXXO	
	Biloka								
			Biloka			P. M. G.	1929	XXXXXXXXXXXXXX	
	L. Tempe								
			Menge			DIPERTA	1922	OOOOOOOOXOOOXX	Daily ; 1962-69,72-73
					L. Tempe	P3 SA	Oct. 1975	XXXXXXXXXXXXXO	
					Laringgi	DIPERTA	Feb. 1968	XXXXXXOOOOXXXX	
	L. Sidenreng								
			Amparita			DIPERTA	1921	XXXXXXOXOOOOOO	Daily ; 1972-1975
			B. Alakuang			P. M. G.	1909	XXXXXXXXXXXXXX	
					L. Sidenreng	P3 S A	Oct. 1975	XXXXXXXXXXXXXO	
			Bulu Timarang			P. M. A	Nov. 1974	XXXXXXXXXXXXXX	
			Rappang			DIPERTA	1909	OOOOXXXXOOOOOO	Daily ; 1962-65,71-75
Gilirang									
	Gilirang								
			Sakoli			DIPERTA	Apr. 1969	XXXXXXOOOOOOOO	Daily ; 1974~1975
			Parra			"	1918	OOOOOOOOOOOOOO	Daily ; 1962~1975
			Peneki			"	1928	XXXXXXXXOOOOOO	Daily ; 1972~1975
					Gilirang	P3 SA	Sep. 1975	XXXXXXXXXXXXXO	
					Tarumpakae	"	"	XXXXXXXXXXXXXO	
	Total	5	46	8	19				

(Note)
P3 SA Proyek Perancangan and Pengembangan Sumber2 Air
P M A Penyelidikan Masalah Air
D P M A Direktorat Penyelidikan Masalah Air
P M G Pusat Meteorologi and Geofisika
DIPERTA Dinas Pertanian

Table 2 - 1 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1975 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka	●	●	●	●	●	●	●	●	●	●	●	●	
Buru Cenrana	●	●	●	●	●	●	●	●	●	●	●	●	Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku										●	●	●	
Bila	○	○	○						●	●	●		
Tanru Tedong (1)	○	○	○						●	●	●		
Tanru Tedong (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Anabanua													
Bontouse							○		○				
Katumpi	●	●	●	●	○	○	●	●	●	●	●	●	
Sing Kang (1)	●	●	●	●	●	●	●	●	●	●	●	●	Ⓐ
Sing Kang (2)													
Palaguna	○	○	○	○	○	○	○	○	○	○	○	○	
Lerang	●	●	●	●	●	●	●	●	●	●	●	●	
Pampanua													
Palima													
Biru	●	●	●	●	●	●	●	●	●	●	●	●	
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone						○	○	○	○	○		○	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba	●	●	●	●	●	●	●	●	●	●	●	●	Ⓐ
Maradda	●	●	●	●	●	●	●	●	●	●	●	●	
Palatae	●	●	●	●	●	●	○	○	○	○		○	
Camming													
Parigi						●	●	●	●	●	●		
Matango							●	●	●	●	●		
Ujung Lamuru (1)	●		●	●	●	●	●	●	●	●	●		Ⓐ
Ujung Lamuru (2)													
Bengo	●	●	●	●	●	●	●	●	●	●	●	●	
Paciro					●	●	●	●	●	●	●	●	
Turucinnae						●	●	●	●	●	●		
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe	●	●	●	●	●	●	●	●	●	●	●	●	
Cabbenge (1)	●	●	●	●	●	●	●	●	●	●	●	●	Ⓐ
Cabbenge (2)	○	○	○	○	○	○	○	○	○	○	○	○	
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga	○	○	○	○	○	○	○	○	○	○		○	
Batubatu		●	●	●	●	●	●	●	●	●	●	●	
Biloka													
Amparita	●	●		●	●	●	●	●	●	●	●	●	
B. Alakuang													
Blewa (Menge)													
Bulu Timarang													
Rappang	●	●	●	●	●	●	●	●	●	●	●	●	
Sakoli	●	●	●	●	●	●	●	●	●	●	●	●	
Paria	●	●	●	●	●	●	●	●	●	●	●	●	
Peneki	●	●	●	●	○	●	●	●	●	●	●		

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 2 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1974 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka	●	●	●	●	●	●	●	●	●	●	●		
Buru Cenrana					●	●	●	●	●	●	●	●	Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Anabanua													
Bontouse													
Katumpi	●	●	●	●	●	●	●	●	●	●	●	●	
Sing Kang (1)													
Sing Kang (2)													
Palaguna	●	●	●	●	●	●	●	●	●	●	●	●	
Lerang	●	●	●	●	●	●	●	●	●	●	●	●	Ⓐ
Pampanua													
Palima													
Biru	●	●	●	●	●	●	●	●	●	●	●	●	
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba					●	●	●	●	●	●	●	●	Ⓐ
Maradda	●	●	●	●	●	●	●	●	●	●	●	●	
Palatae							●	●	●	●	●	●	
Camming													
Parigi													
Matango													
Ujung Lamuru (1)				●	●	●	●	●	●	●	●	●	Ⓐ
Ujung Lamuru (2)													
Bengo	●	●	●	●	●	●	●	●	●	●	●	●	
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●		●	●	
Lilirilau													
Malanroe	●	●	●	●	●	●	●	●	●	●	●	●	
Cabbenge (1)					●	●	●	●	●	●	●	●	Ⓐ
Cabbenge (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	●	●	●	●	●	●	●	●	●	
Biloka													
Amparita	●	●	●	●	●	●	●	●	●	●	●	●	
B. Alakuang													
Bowa (Menge)													
Bulu Timarang													
Rappang	●	●	●	●	●	●	●	●	●	●	●	●	
Sakoli			●	●	●	●	●	●	●	●	●		
Paria	●	●	●	●	●	●	●	●	○	●	●	●	
Peneki	●	●	●	●	●	●	●	●	●	●	●	●	

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 3 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1973 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Anabanua													
Bontouse													
Katumpi	●	●	●	●	●	●	●	●					
Sing Kang (1)													Ⓐ
Sing Kang (2)													
Palaguna	●	●	●	●	●	●	●	●	●	●	●	●	
Lerang	●	●	○	●	●	●	●	○	○	●			
Pampanua													
Palima													
Biru	●	●	●	●	●	●	●	●	●	●	●	●	
Maccopc	●	●	●	●	●	●	●	●		○	○		
Watanpone	●	●	●	●	●	●	●	●	●	○	●	◑	
Cellu	○	●	●	●	●	●	●	●	○	○	○	○	
Kappang													
Camba													Ⓐ
Maradda	●	●	●	●	●	●	●	●		○	○		
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo	●	●	●	●	●	●	●	●	○	○		○	
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau	○	○	○	○	○	○							
Malanroe	●	●	●	●	●	●	●	●	●	●	●	●	
Cabbenge (1)													Ⓐ
Cabbenge (2)	●	●	●	●	●	●				●	●	●	
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga	○	○	○	○	○	○	○	○	○	○	○	○	
Batubatu	●	●	●	●	●	●	●	●	●	●	●	●	
Biloka													
Amparita	●	●	●	●	●	●	●	●	●	●	●	●	
B. Alakuang													
Blewa (Menge)	●	●	●	●	●								
Bulu Timarang													
Rappang	●	●	●	●	●	●	●	●	●	●	●	●	
Sakoli	○	○	○				○	○	○	○			
Paria	●	●	●	●	●	●		●	●	●	●	●	
Peneki	●	●	●	●	●	●	●	●	●	●	●	●	

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 4 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1972 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Anabanua													
Bontouse	●	●	●	●	●	●	●	●	●	●	●	●	
Katumpi	●	●	●	●	●	●	●	●	●		●	○	
Sing Kang (1)													Ⓐ
Sing Kang (2)	●												
Palaguna	●	●	●	●	●	○	●	●			●	●	
Lerang	●	●	●	●	●	●	●	●	●	●	●	●	
Pampanua													
Palima													
Biru	●	●	●	●	●	●	●	●	●	●	●	●	
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda	●	●	●	●	●	●	●	●	●	●	●	●	
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo	●	●	●	●	●	●	●	●	●	●	●	●	
Pacira													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau	○	○	○	○	○	○	○	○	○	○	○	○	
Malanroe										●	○	●	
Cabbenge (1)													Ⓐ
Cabbenge (2)	●	●	●	●	●	●	●	●			●	●	
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga	○	○	○	○	○	○	○		○			○	
Batubatu												○	
Biloka													
Amparita	●	●	●	●	●	●	○	●	●	○	●	●	
B. Alakuang													
Plewa (Menge)	○		○	●	●	●	●	●	●	●	●	●	
Buiu Timarang													
Rappang	●	●	●	●	●	●	●	●	○	○	○	○	
Sakoli	○			○	○	○		○	○	○	○	○	
Paria	●	○	○	●	●	○	●	●	●	●	●	●	
Peneki	●	●	●	●	●	●	●	●	●	●	●	●	

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 5 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1971 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)				●	●	●	●	●	●	●	○	●	
Anabanua													
Bontouse	●	●	●	●	●	●	●	●	●			●	
Katumpi	●	●	●	●	●	●	●	●	●		●	●	
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	○	○	○	○	○	○	○	○	○	○	○	○	
Lerang		○	○	○	○	○	●	●	○	●	●	●	
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●	●	●	○	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●			
Cellu	●	●	○	●	○	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda		○	○	●	●	●	●	●	●	●	●	●	
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													
Ujung Lamuru (2)													Ⓐ
Bengo			○	○	○	●	●	●	●	○	●	●	
Paciro													
Turucinnae													
Takalala			●	●	●	●	●	●	●	●	●	●	
Lilirilau					○		○	○	○	○	○	○	
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)							●	○	●	○	○	●	
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu													
Biloka													
Amparita	○	○	○	○			○	○	○	○	○	○	
B. Alakuang													
Blewa (Menge)							○	○	○	○	○	○	
Bulu Timarang													
Rappang				●	●	●	●	●	●	●		●	
Sakoli	○	○	○	○	○	○	○	○	○	○			
Paria				●	●	●	●	●	●	○	○	○	
Peneki							○	○	○	○	○	○	

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 6 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1970 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua			●	●		●							
Bontouse	●	●	●	●	●	●	●	●	●	●	○	●	
Katumpi	○	○	○	○	○	○	●	●	●	●	●	●	
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	●		●	●	●	●	●	●	●	●	●	●	
Lerang													
Pampanua													
Palima													
Biru													
Maccope	○	○	○	○	○	○	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	○	○	○	○	○	○	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	○	○	○	●	○	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu													
Biloka													
Amparita													
B. Alakuang													
Blewa (Meng.)													
Bulu Timarang													
Rappang													
Sakoli	○	○	○	○	○	○	○	○	○	○	○	○	
Paria	●	●	●										
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 7 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1969 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua													
Bontouse											○	○	
Katumpi	●	●	●	●	●	●	●	●	●	●	●	●	
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	●	●	●	●	●	●	●	●	○	●	●	●	
Lerang													
Pampanua													
Palima													
Biru				○	●	●	●	●	●		○		
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●						○	○	○	●	●	●	
Canru	●	●	○	●	●	●	●	●	●	●	●		
Lajonga													
Batubatu													
Biloka													
Amparita	○	○	○	○	○	○	○	○	○	○	○	○	
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●					
Bulu Timarang													
Rappang													
Sakoli					○	○	○	○	○	○	○	○	
Paria	●	●	●		●	●	●	●	●	●	●	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2-8 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1968 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●											
Bontouse													
Katumpi	●	●	●	●	●	●	●	●	●	●	●	●	
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	●	●	●	●	●	●	●	●	●	●	●	●	
Lerang													
Pampanua													
Palima													
Biru	○	●	○	●	●	●	●						
Maccopc	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	○	○	○	○	○	○	○	○	○	○	○	○	
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●	●	●	●	●	
Bulu Timarang													
Rappang													
Sakoli													
Parla	●	●	●	●	●	●	●	●	●	●	●	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 9 **RAINFALL DATA - EXISTING CONDITION**

station \ year / month	1967 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●	●	●	●	●	●	●	●		●	●	
Bontouse	●	●	●	●									
Katumpi	○	○	○			○	○	○	○				
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	○	○	○	○	○	○	○	○	○	○	○	○	
Lerang													
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●										
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	●	●	○	○	○					
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●	●	●	●	●	
Bulu Timarang													
Rappang													
Sakoli													
Paria	●	●	●	●	●	●	●	●	●	●	●	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 10 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1966 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●	●	●	●	●	●	●	●	●	●	●	
Bontouse	●	●	●	●	●	●	●	●	●	●	●	●	
Katumpi													
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	○	○	○	○	○	○					○	○	
Lerang													
Pampanua													
Palima													
Biru													
Maccope													
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu													
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	○	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	●	●	●	●	●	●	●	●	●	
Biloka													
Amparita													
B. Alakuang													
Blewa (Meng:)	●	●	●	●	●	●	●	●	●	●	●	●	
Bulu Timarang													
Rappang													
Sakoli													
Paria	●	●	●	●	●	●	●	●	●	●	○	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 11 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1965 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	○	●	●	●	●	●	●		●	●	●	
Bontouse	●	●	●	●	●	●	●	●		●	●	●	
Katumpi													
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	○	●	●	●	●	●	●	●	●	●	
Palaguna	○	○	○	○	○	○					○	○	
Lerang													
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●	●	●	●	●	●	●	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●	●	●	●	●	●	●	●	
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	●	○	●	●	
Canru	●	○	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	●					●	●	●	●	
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	○	●	●	●	●	●	●	●	●	●	●	
Bulu Timarang													
Rappang	●		●	●	●	●	●	●	●	●	○	○	
Sakoli													
Paria	●	○	●	●	●	●	●	●	●	●	○	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○: Monthly Rainfall Data ●: Both Monthly and Daily Rainfall Data

Table 2 - 12 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1964 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●	●	●	●	●	●	●	●	●	●	●	
Bontouse	●	●	●	●	●	●	●	●	●	●	●	●	
Katumpi													
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●	●	●	
Palaguna	○	○	○	○	○	○	○	○	○	○	○	○	
Lerang													
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●	●	●					
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu		●	●	●	●	●	●	●	●	●			
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													
Ujung Lamuru (2)													Ⓐ
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	○	●	●	●	●	●	●	●	●	
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●	●	●	●	●	
Pulu Timarang													
Rappang	●	●	●	●	●	●	●		●				
Sakoli													
Paria	●	●	●	●	●	●	●	●	●	●	●	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 2 - 13 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1963 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●	●	●	●	●	●	●	●		●	●	
Bontouse	●	●	●	●	●	●	●	●			●	●	
Katumpi													
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●				●	
Palaguna	○	○	○	○	○	○	○	○	○	○	○	○	
Lerang													
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●					○	○	
Watanpone	●	●	●	●	●	●	●	●	●	●	●	●	
Cellu	●	●	●	●	●								
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●	●	●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●		●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●	●	●	
Lajonga													
Batubatu	●	●	●	●	●	●	●	●	●	●	●	○	
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●	●	○	●	●	
Bulu Timarang													
Rappang	●	●	●	●	●	●	●	●			●	●	
Sakoli													
Paria		●	●	●	●	●	●	●			●	●	
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table-2 - 14 RAINFALL DATA - EXISTING CONDITION

station \ year / month	1962 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Baraka													
Buru Cenrana													Ⓐ
Maroanging (1)													
Maroanging (2)													
Barukku													
Bila													
Tanru Tedong (1)													
Tanru Tedong (2)													
Anabanua	●	●	●			●	●	●	●	○	○	●	
Bontouse	●	●	●	○	●	●	○	○	●	○	●	●	
Katumpi													
Sing Kang (1)													Ⓐ
Sing Kang (2)	●	●	●	●	●	●	●	●	●	●		●	
Palaguna													
Lerang													
Pampanua													
Palima													
Biru													
Maccope	●	●	●	●	●	●	●	●	●	●	●		
Watanpone													
Cellu	●	●	●	●	●	●	●	●					
Kappang													
Camba													Ⓐ
Maradda													
Palatae													
Camming													
Parigi													
Matango													
Ujung Lamuru (1)													Ⓐ
Ujung Lamuru (2)													
Bengo													
Paciro													
Turucinnae													
Takalala	●	●	●	●	●		●	●	●	●	●	●	
Lilirilau													
Malanroe													
Cabbenge (1)													Ⓐ
Cabbenge (2)													
Watan Soppeng	●	●	●	●	●	●	●	●	●	●	●	●	
Canru	●	●	●	●	●	●	●	●	●	●		●	
Lajonga													
Batubatu	●	●	●	●	●	●	●	●	●	○	●	●	
Biloka													
Amparita													
B. Alakuang													
Blewa (Menge)	●	●	●	●	●	●	●	●	●	●		●	
Bulu Timarang													
Rappang	●	●	●	●	●	●	●	●	●	●	●	●	
Sakoli													
Paria	●	●	●	●	●		●	●	●				
Peneki													

Ⓐ ; Automatical Rain Gauge ○; Monthly Rainfall Data ●; Both Monthly and Daily Rainfall Data

Table 3-1 RECORD OF MONTHLY RAINFALL

1975 (1)

River	S. Name \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Bila River	Baraka	97 / 8	160 / 12	123 / 16	150 / 16	204 / 22	162 / 16	172 / 16	183 / 10	173 / 14	156 / 19	52 / 8	67 / 5	1969 / 162
	Buru Cenrana	95 / 12	64 / 12	87 / 10	275 / 19	260 / 27	140 / 9	303 / 20	268 / 17	139 / 15	265 / 19	51 / 11	119 / 13	2066 / 184
	Maroanging (1)	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	/
	Maroanging (2)	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	/
	Barukku	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	177 / 15	- / -	36 / 7	213 / 22
	Bila	47 / 2	- / -	73 / 1	- / -	- / -	- / -	- / -	- / -	243 / 16	175 / 15	- / -	- / -	538 / 34
	Tanru Tedong (1)	14 / 3	60 / 10	31 / 7	- / -	- / -	- / -	- / -	- / -	329 / 19	178 / 12	25 / 6	/ -	637 / 57
	Tanru Tedong (2)	5 / 3	66 / 6	45 / 7	199 / 15	360 / 14	259 / 14	195 / 14	230 / 11	372 / 17	274 / 14	36 / 7	37 / 9	2078 / 131
	Anabanua	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	/
	Bontouse	x / x	x / x	x / x	x / x	x / x	x / x	170 / 4	140 / 5	170 / 9	164 / 9	230 / 12	x / x	874 / 39
Cenranae River	Katumpi	102 / 10	87 / 10	167 / 8	228 / 9	548 / 18	404 / 19	124 / 17	227 / 14	314 / 21	160 / 13	306 / 9	78 / 8	2745 / 156
	Sing Kang (1)	13 / 5	52 / 9	9 / 6	120 / 18	88 / 8	152 / 16	42 / 7	110 / 14	192 / 19	160 / 20	61 / 6	53 / 9	1052 / 137
	Sing Kang (2)	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -
	Palaguna	26 / 1	42 / 3	48 / 4	142 / 7	213 / 13	174 / 13	199 / 10	125 / 6	199 / 11	241 / 12	89 / 7	61 / 8	1559 / 95
	Lerang	179 / 12	138 / 5	386 / 13	332 / 15	548 / 18	336 / 14	277 / 16	229 / 9	172 / 10	195 / 8	136 / 7	120 / 6	3048 / 133
	Pampanua	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	/
	Palima	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	/

Table 3-2 RECORD OF MONTHLY RAINFALL

1975 (2)

River	S. Name \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
	Biru	194 / 13	156 / 7	125 / 9	319 / 18	394 / 19	385 / 19	241 / 17	193 / 7	176 / 13	148 / 7	93 / 6	164 / 10	2588 / 145
	Maccope	76 / 5	123 / 6	145 / 12	273 / 19	368 / 17	404 / 19	286 / 18	51 / 6	120 / 8	224 / 10	77 / 8	57 / 6	2204 / 134
	Watanpone	x / x	x / x	x / x	x / x	x / x	36 / 5	218 / 11	107 / 7	110 / 11	152 / 11	- / -	140 / 10	763 / 55
	Cellu	248 / 13	85 / 5	94 / 8	190 / 14	300 / 19	386 / 20	185 / 14	126 / 12	231 / 18	145 / 12	163 / 8	108 / 7	2261 / 150
Walanae River	Kappang	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Camba	193 / 23	235 / 23	178 / 21	120 / 14	143 / 19	89 / 14	151 / 16	68 / 11	60 / 10	97 / 17	69 / 16	6 / 2	1409 / 186
	Maradda	118 / 7	30 / 4	72 / 8	144 / 19	480 / 20	373 / 17	406 / 17	258 / 12	185 / 12	229 / 12	62 / 5	92 / 7	2449 / 140
	Palatae	166 / 15	140 / 11	101 / 11	309 / 22	426 / 19	357 / 18	391 / 13	212 / 13	157 / 10	196 / 12	- / -	83 / 12	2538 / 156
	Camming	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Parigi	x / x	x / x	x / x	x / x	x / x	276 / 17	124 / 16	130 / 9	25 / 7	39 / 13	20 / 11	x / x	614 / 75
	Matango	x / x	x / x	x / x	x / x	x / x	x / x	266 / 19	146 / 6	156 / 10	327 / 19	29 / 1	x / x	924 / 53
	Ujung Lamuru (1)	69 / 9	- / -	87 / 8	145 / 16	485 / 15	255 / 21	246 / 16	128 / 10	108 / 15	239 / 19	89 / 10	- / -	1851 / 139
	Ujung Lamuru (2)	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Bengo	101 / 14	150 / 9	206 / 13	157 / 14	435 / 13	238 / 18	323 / 19	180 / 10	147 / 17	309 / 15	- / -	98 / 15	2344 / 157
	Paciro	x / x	x / x	x / x	x / x	241 / 15	231 / 17	234 / 15	47 / 8	76 / 9	123 / 22	205 / 15	55 / 12	1212 / 113
	Turucinnae	x / x	x / x	x / x	x / x	x / x	199 / 18	268 / 20	34 / 8	139 / 14	324 / 21	116 / 13	x / x	1080 / 94
	Takalala	54 / 9	72 / 7	95 / 7	180 / 14	321 / 24	155 / 12	156 / 11	89 / 7	146 / 13	163 / 13	128 / 10	115 / 11	1674 / 138

Table 3-3 RECORD OF MONTHLY RAINFALL

1975 (3)

River	S. Name \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
	Lilirilau	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Malanroe	44 / 6	18 / 5	109 / 13	123 / 14	98 / 14	111 / 10	47 / 11	52 / 5	34 / 12	89 / 7	5 / 3	6 / 3	736 / 103
	Cebbenge (1)	26 / 2	- / -	21 / 3	10 / 1	60 / 10	56 / 4	15 / 2	20 / 5	55 / 10	113 / 6	- / -	50 / 7	426 / 50
	Cebbenge (2)	42 / 2	45 / 9	150 / 5	174 / 9	312 / 13	251 / 13	261 / 11	123 / 5	179 / 7	193 / 8	60 / 7	124 / 10	1914 / 99
	Watan Soppeng	67 / 7	39 / 8	124 / 10	199 / 12	220 / 19	187 / 14	240 / 17	119 / 9	170 / 16	161 / 12	83 / 8	149 / 14	1758 / 146
	Canru	18 / 3	122 / 7	90 / 9	205 / 9	415 / 14	281 / 13	202 / 8	116 / 5	242 / 11	370 / 15	165 / 6	152 / 14	2378 / 114
D. Tempe	Lajonga	70 / 9	154 / 8	59 / 6	149 / 14	207 / 18	157 / 7	213 / 17	183 / 13	170 / 19	88 / 6	- / -	115 / 12	1565 / 129
	Batubatu	- / -	10 / 4	127 / 9	108 / 13	246 / 20	168 / 11	144 / 11	127 / 7	110 / 8	366 / 14	52 / 6	123 / 10	1581 / 113
	Biloka	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Amparita	42 / 5	91 / 7	- / -	106 / 7	199 / 11	170 / 9	184 / 9	173 / 5	124 / 13	210 / 6	62 / 3	197 / 9	1558 / 84
	B. Alakuang	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Blewa (Menge)	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Bulu Timarang	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	x / x	
	Rappang	79 / 8	54 / 9	152 / 14	214 / 13	285 / 14	245 / 11	224 / 16	254 / 9	110 / 17	191 / 13	183 / 9	164 / 19	2155 / 152
Gilirang River	Sakoli	45 / 4	63 / 5	46 / 4	265 / 12	437 / 18	372 / 12	253 / 20	173 / 14	521 / 24	309 / 17	126 / 11	29 / 7	2639 / 148
	Paria	80 / 4	186 / 7	63 / 5	342 / 7	516 / 9	503 / 10	258 / 7	254 / 5	623 / 12	344 / 9	177 / 4	20 / 2	3366 / 81
	Peneki	65 / 7	101 / 8	48 / 10	356 / 16	260 / 27	326 / 19	237 / 17	193 / 13	319 / 20	332 / 17	163 / 7	x / x	2400 / 161

Table 4-1 RECORD OF DAILY RAINFALL

1972

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	23	–	–	–	–	–	–	–	–	–	–	–
2	24	23	–	–	21	–	–	–	–	–	–	–
3	28	21	–	–	–	–	–	–	–	–	–	–
4	25	16	–	–	–	–	–	–	–	–	–	13
5	–	7	–	4	32	–	–	–	15	–	–	–
6	–	–	–	–	–	–	–	–	–	–	–	25
7	14	–	5	–	–	–	–	–	–	–	–	–
8	2	–	–	–	–	–	–	–	–	–	–	–
9	48	13	–	–	–	–	–	–	–	–	–	–
10	25	–	10	2	–	–	–	–	–	–	–	–
11	11	–	–	–	11	–	–	–	–	–	–	–
12	9	15	–	–	–	11	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–	–	–	–
14	–	–	–	21	–	–	–	–	–	–	–	10
15	–	–	–	–	17	–	–	–	–	–	–	7
16	6	41	17	–	–	3	–	–	–	–	–	6
17	–	–	–	–	20	–	–	–	–	–	5	–
18	3	–	–	32	4	–	–	7	–	–	–	–
19	–	33	–	–	–	–	–	–	–	–	–	10
20	–	–	6	–	–	–	–	–	–	–	–	7
21	–	–	–	–	–	–	–	–	–	–	–	8
22	–	–	–	51	–	–	–	–	–	–	–	5
23	–	–	–	–	–	–	–	–	–	–	–	–
24	5	4	–	–	–	–	–	–	–	–	–	–
25	–	–	13	–	–	–	–	–	–	–	–	–
26	–	–	1	–	–	–	–	–	–	–	12	13
27	–	–	–	–	–	–	–	–	–	–	–	–
28	–	–	9	–	–	–	–	–	–	–	–	–
29	–	26	–	50	–	–	–	–	–	–	–	–
30	–	–	10	–	–	–	–	–	–	–	–	–
31	11	–	–	–	–	–	–	–	–	–	–	–
Σ	234	199	71	160	105	14	–	7	15	–	17	104

1973

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	11	–	–	–	–	–	32	–	–	–	–	21
2	–	–	–	18	45	–	–	–	–	–	–	21
3	–	–	–	12	–	21	7	30	22	–	–	–
4	20	–	26	14	–	–	22	–	–	–	–	–
5	30	14	–	–	21	–	–	38	28	–	–	–
6	14	12	19	–	–	11	29	15	15	–	–	28
7	13	17	8	27	26	–	11	–	–	11	–	30
8	–	–	–	–	–	7	4	16	–	–	–	11
9	15	–	–	–	–	10	36	–	30	–	–	–
10	7	11	10	32	–	–	42	–	–	–	–	–
11	32	–	13	–	–	17	–	–	25	7	–	37
12	–	9	7	–	–	–	–	–	–	–	–	–
13	12	–	4	–	–	–	17	–	10	9	–	16
14	9	–	6	40	–	–	28	–	–	–	–	–
15	25	20	–	20	31	29	17	–	–	–	–	–
16	34	31	–	–	–	–	–	25	45	–	–	17
17	–	–	–	11	–	–	13	–	5	–	–	–
18	–	–	–	–	23	3	–	–	17	–	–	–
19	7	18	–	34	20	–	41	–	21	13	–	13
20	–	–	–	–	–	–	–	–	26	4	–	19
21	–	6	7	15	–	–	–	–	3	–	103	22
22	12	13	–	–	–	32	50	–	14	–	125	10
23	–	5	4	21	–	–	–	–	–	17	71	–
24	–	10	–	–	–	–	–	–	36	–	89	–
25	9	–	–	–	–	4	12	–	–	–	–	28
26	–	–	–	33	–	–	–	–	47	25	–	29
27	16	–	–	–	–	13	15	–	–	–	–	36
28	–	–	–	–	–	–	–	–	–	–	14	–
29	–	–	–	–	–	6	13	–	–	–	19	7
30	–	–	–	–	31	8	16	–	–	–	–	–
31	–	–	–	–	–	–	19	–	–	–	–	–
Σ	266	166	104	277	197	161	424	124	344	86	421	345

1974

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	13	14	–	–	–	15	–	/	–	–
2	–	–	30	17	–	–	7	25	–	/	–	8
3	–	4	40	–	–	–	9	11	–	/	–	–
4	–	–	16	–	–	28	6	–	–	/	2	1
5	–	9	19	20	–	–	4	19	–	/	–	–
6	–	–	22	–	34	10	29	30	–	/	–	12
7	–	–	–	9	–	–	–	–	–	/	–	–
8	–	–	–	–	–	–	–	–	2	/	6	–
9	–	7	30	–	–	–	–	–	11	/	20	–
10	26	–	37	–	7	–	–	–	4	/	–	–
11	–	–	11	31	–	–	6	–	–	/	7	–
12	–	29	13	–	–	–	7	–	–	/	–	–
13	–	–	19	–	–	–	11	–	6	/	–	–
14	14	–	–	–	–	–	4	–	–	/	–	–
15	–	7	–	–	16	23	10	–	–	/	–	17
16	–	–	15	–	–	37	13	–	–	/	–	–
17	33	–	–	11	20	29	30	–	–	/	–	–
18	–	43	–	–	–	14	4	7	–	/	–	–
19	6	–	24	–	–	17	6	–	–	/	–	–
20	–	–	–	13	–	33	–	–	–	/	–	1
21	11	–	6	–	–	13	–	–	–	/	–	11
22	–	–	–	–	–	10	22	–	–	/	–	–
23	–	–	–	–	86	–	–	9	–	/	–	7
24	–	–	10	–	6	8	30	–	–	/	–	–
25	–	17	–	–	–	11	–	–	–	/	–	–
26	–	–	30	–	–	–	–	–	–	/	8	2
27	29	26	–	6	–	–	4	10	–	/	–	3
28	7	14	–	–	11	–	9	–	–	/	2	–
29	–	–	–	–	–	–	3	–	–	/	11	–
30	31	–	–	–	–	–	11	–	–	/	4	–
31	–	–	–	–	–	–	–	–	–	/	–	14
Σ	157	156	335	121	180	233	225	126	23		60	76

1975

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	10	–	–
2	–	–	–	–	5	15	–	–	–	1	2	–
3	4	31	–	–	20	25	–	6	11	1	41	–
4	–	–	–	–	–	2	52	–	2	–	–	–
5	–	–	15	–	11	–	–	–	–	2	24	2
6	–	–	35	–	9	4	–	–	8	–	–	9
7	–	8	–	–	2	9	7	15	16	11	–	–
8	–	–	–	–	15	26	–	–	20	–	–	–
9	2	–	–	35	25	10	–	–	1	–	–	–
10	–	–	–	15	20	21	18	–	15	4	–	–
11	–	–	–	–	–	–	–	4	–	–	–	–
12	–	14	–	25	8	–	2	–	2	–	–	1
13	4	–	–	–	–	–	–	–	22	28	–	–
14	–	–	–	–	29	–	12	–	–	–	6	–
15	–	–	4	–	49	2	–	–	–	–	–	2
16	3	–	–	14	–	21	–	–	18	13	–	34
17	24	–	–	8	–	–	3	20	–	9	–	10
18	–	–	–	10	–	16	–	–	–	–	–	21
19	–	5	–	5	7	4	–	–	–	–	–	–
20	–	–	8	14	28	–	2	–	–	21	–	–
21	3	–	–	7	3	–	–	–	–	–	1	–
22	1	6	13	2	2	–	14	–	1	14	–	–
23	–	–	–	6	29	–	–	19	–	–	4	–
24	–	–	–	–	5	–	30	–	–	–	19	–
25	–	5	–	–	4	–	–	–	2	11	11	18
26	–	–	14	–	1	–	8	–	–	–	–	2
27	–	–	–	1	8	–	8	8	–	–	10	–
28	–	3	–	4	30	–	–	–	28	18	–	5
29	11	–	6	34	6	–	–	17	–	–	–	–
30	2	–	–	–	1	–	–	–	–	30	–	11
31	–	–	–	–	4	–	–	–	–	–	–	–
Σ	54	72	95	180	321	155	156	89	146	163	128	115

Table 4-2 RECORD OF DAILY RAINFALL

1968

Basin: Walanae Station: Takalala

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	18	17	–	–	–	3	–	–	–	–	–	–
2	–	–	–	2	–	–	35	–	–	–	–	–
3	–	–	–	7	–	2	–	–	–	–	–	46
4	18	–	–	–	–	8	7	–	–	–	19	16
5	–	–	–	–	–	4	–	–	–	–	–	2
6	–	2	–	–	–	–	–	–	–	–	–	–
7	–	–	9	–	34	–	–	–	–	–	–	–
8	–	17	11	11	–	–	6	30	–	–	–	–
9	14	–	–	–	8	–	4	2	–	–	–	–
10	–	–	–	10	–	21	11	1	10	–	–	17
11	–	–	95	–	–	1	13	–	–	–	–	–
12	–	9	–	–	–	33	3	5	–	–	–	2
13	35	2	–	–	–	–	–	1	17	–	–	–
14	–	–	14	–	–	14	–	–	–	–	–	3
15	79	–	–	15	–	–	27	–	–	–	–	–
16	24	–	–	2	–	–	–	–	–	–	–	19
17	9	16	–	20	–	52	–	12	–	–	–	2
18	6	–	18	–	27	2	4	–	–	–	50	3
19	9	17	19	–	–	14	–	–	–	–	–	–
20	–	9	42	–	28	3	7	22	–	–	–	–
21	–	14	2	–	–	3	–	–	–	18	–	–
22	23	11	6	1	–	32	25	30	–	–	–	–
23	20	–	3	2	–	–	2	–	–	–	–	–
24	4	–	2	16	4	–	7	–	–	–	–	–
25	–	–	10	5	–	8	–	–	–	–	–	–
26	–	–	–	–	–	–	55	–	–	–	–	12
27	7	2	14	6	8	–	2	6	–	–	–	–
28	–	–	20	–	–	–	–	–	–	52	–	10
29	5	–	28	3	1	14	9	9	–	9	–	–
30	–	–	24	–	–	–	3	1	–	6	75	3
31	–	–	20	–	–	–	–	–	–	1	–	12
Σ	282		337		110		238		27		144	
		116		100		214		119		86		147

1969

Basin: Walanae Station: Takalala

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	6	25	–	6	10	–	–	–	–
2	–	–	–	58	35	–	–	–	–	–	–	–
3	11	–	–	25	–	–	–	–	–	–	–	–
4	–	3	18	27	–	–	17	–	–	–	–	–
5	–	–	–	–	–	–	23	–	–	–	–	–
6	–	21	–	–	–	3	–	–	–	–	4	–
7	37	–	–	–	7	–	–	–	–	–	–	–
8	3	–	–	12	–	–	–	–	–	–	–	–
9	–	–	–	26	39	85	–	3	–	–	–	–
10	9	1	–	3	–	–	–	–	–	–	22	–
11	–	19	–	–	–	–	–	–	–	–	–	–
12	–	–	–	–	17	–	10	–	–	–	–	–
13	14	–	–	–	17	–	–	24	–	–	–	13
14	–	–	–	–	–	–	–	–	–	–	–	–
15	20	60	–	–	–	–	–	–	–	–	–	65
16	5	–	–	20	48	24	5	–	–	–	12	15
17	–	30	150	–	–	–	–	–	15	–	–	50
18	–	–	–	–	–	–	–	–	40	–	–	55
19	–	–	–	15	–	–	5	–	7	–	–	16
20	–	–	–	–	–	–	–	–	–	–	13	–
21	53	–	–	10	–	–	–	–	–	21	–	–
22	–	–	–	–	–	–	–	–	–	51	–	25
23	7	–	–	–	17	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	25	–
25	–	–	–	–	–	–	–	48	–	–	–	45
26	–	–	–	–	–	–	–	–	–	–	25	–
27	–	–	–	–	–	–	–	–	–	–	–	–
28	–	–	–	–	10	–	–	–	–	–	–	–
29	24	–	–	48	–	–	–	–	7	21	–	–
30	6	–	–	–	–	68	–	–	–	–	–	–
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	149		168		215		66		69		101	
		134		250		180		85		93		264

1970

Basin: Walanae Station: Takalala

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	–	–	12
2	–	–	–	–	13	17	–	–	–	–	–	–
3	–	–	–	–	24	20	–	–	–	–	15	20
4	49	10	–	15	–	55	18	–	–	–	–	–
5	–	–	–	–	–	11	–	–	–	–	20	–
6	–	–	–	–	–	50	–	–	–	20	–	–
7	–	–	20	–	–	–	19	–	–	–	45	–
8	–	–	–	–	–	–	11	–	–	–	–	51
9	–	–	–	–	51	–	–	–	–	15	–	–
10	–	–	–	–	–	–	–	–	–	–	–	–
11	–	–	–	–	21	35	45	–	–	17	30	–
12	–	–	71	–	–	–	15	–	–	5	15	–
13	–	–	–	2	32	–	27	–	15	–	5	60
14	–	7	37	–	–	–	38	–	–	–	–	–
15	–	–	–	–	–	–	7	–	–	–	25	–
16	–	–	–	–	–	–	–	–	6	21	–	–
17	–	–	–	–	–	–	2	–	–	–	22	13
18	50	–	–	–	–	–	–	–	–	21	–	–
19	55	2	–	–	–	–	21	–	–	60	–	–
20	–	–	–	–	–	–	32	–	–	13	–	–
21	–	–	–	–	24	–	12	18	–	45	18	–
22	–	–	–	–	15	–	5	–	–	8	32	–
23	–	–	35	–	40	5	–	–	–	11	7	15
24	–	–	–	–	–	–	–	5	–	–	–	17
25	–	–	–	–	–	–	–	–	–	30	4	–
26	–	–	–	–	–	–	–	–	53	–	–	35
27	–	–	–	–	–	–	10	–	–	11	6	–
28	17	–	–	63	–	–	–	–	–	39	–	–
29	13	–	–	–	–	13	–	–	–	12	52	–
30	–	–	–	–	–	–	–	–	–	25	–	–
31	–	–	–	–	–	–	14	–	–	2	–	–
Σ	184		154		220		276		74		309	
		19		80		206		23		342		223

1971

Basin: Walanae Station: Takalala

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	/	/	–	32	49	4	–	–	17	–	–	–
2	/	/	–	32	–	–	7	–	–	25	–	–
3	/	/	–	–	–	20	–	–	–	–	–	17
4	/	/	–	–	–	–	–	–	–	4	41	–
5	/	/	–	–	–	–	–	–	–	–	–	19
6	/	/	–	–	–	19	15	–	–	–	–	–
7	/	/	–	–	–	18	–	9	21	–	–	–
8	/	/	–	15	–	–	–	–	–	30	–	20
9	/	/	–	15	–	–	3	16	7	–	–	–
10	/	/	–	–	20	34	–	–	–	–	–	–
11	/	/	–	–	–	10	9	–	5	–	20	–
12	/	/	27	8	–	–	–	–	–	–	–	–
13	/	/	–	–	–	–	–	–	–	40	6	–
14	/	/	–	–	–	23	–	–	–	10	–	–
15	/	/	2	–	16	–	–	40	13	–	–	–
16	/	/	–	–	–	19	–	–	–	–	–	11
17	/	/	–	–	–	–	13	–	–	–	–	–
18	/	/	–	–	–	–	–	–	9	16	–	–
19	/	/	–	15	15	–	–	–	–	32	–	–
20	/	/	–	16	–	–	–	–	–	–	–	7
21	/	/	–	30	–	–	–	36	30	–	–	–
22	/	/	9	–	–	26	–	–	–	14	–	–
23	/	/	–	–	–	–	–	–	–	–	–	–
24	/	/	–	–	30	25	–	–	28	–	–	–
25	/	/	–	–	–	30	–	–	–	–	–	–
26	/	/	–	–	–	15	23	–	19	–	–	–
27	/	/	20	–	–	5	21	–	–	–	33	–
28	/	/	–	–	–	35	24	–	–	–	–	–
29	·	/	–	–	–	27	–	–	–	–	–	23
30	/	/	–	–	–	–	25	–	6	–	8	–
31	/	/	–	–	–	: :	–	–	–	–	–	22
Σ			58		130		167		155		140	
				163		314		101		139		119

Table 4-3 RECORD OF DAILY RAINFALL

1964

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	39	–	–	–	–	4	–	–	–
2	29	–	41	–	30	–	–	–	–	–	10	–
3	2	25	–	3	–	–	50	37	–	10	–	–
4	–	–	–	–	34	20	1	–	–	–	–	–
5	–	4	–	–	2	–	–	–	–	–	–	15
6	–	–	9	8	–	–	30	–	–	–	–	20
7	10	30	–	–	9	–	–	–	23	–	–	8
8	–	–	–	20	3	30	–	–	–	17	–	10
9	–	–	5	–	–	6	–	–	–	–	–	–
10	10	–	7	–	50	–	11	5	–	–	–	–
11	2	–	1	–	–	–	–	–	–	–	–	–
12	–	–	12	–	–	–	–	–	–	25	–	–
13	–	–	40	11	–	–	35	–	–	–	–	–
14	5	–	3	–	2	–	7	–	57	–	–	–
15	–	–	–	–	–	5	5	–	–	–	–	31
16	–	–	–	20	–	9	8	–	–	–	–	–
17	4	–	–	72	–	4	2	–	–	–	–	–
18	–	–	–	4	31	–	–	–	–	42	–	–
19	–	36	–	–	–	–	–	–	–	28	–	11
20	–	8	–	–	–	–	16	–	–	16	–	–
21	25	–	–	19	–	–	–	–	–	19	–	–
22	–	–	–	16	–	14	–	–	–	–	–	–
23	37	–	20	32	–	–	–	–	–	20	–	18
24	–	–	–	–	–	3	–	–	–	–	–	–
25	–	–	–	–	–	–	–	–	–	58	–	–
26	–	10	–	13	–	–	–	–	9	–	25	–
27	–	5	–	–	–	–	22	–	–	–	75	–
28	–	13	–	–	–	–	–	–	–	–	–	–
29	–	–	–	9	–	–	13	–	–	–	–	–
30	–	–	–	15	–	–	–	–	–	–	4	8
31	–	–	60	–	–	–	–	25	–	–	–	–
Σ	124	131	198	281	161	95	200	67	93	235	114	121

1965

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	18	–	–	–	–	–	–
2	–	–	2	–	–	–	–	–	–	–	–	–
3	–	–	–	–	34	–	–	–	–	–	–	–
4	–	–	–	–	16	–	–	–	–	–	–	–
5	–	–	–	–	6	11	–	–		–	–	–
6	–	–	–	–	3	–	–	–	–	–	–	–
7	39	39	–	–	–	14	–	–	–	–	–	–
8	–	–	–	11	2	27	–	–	–	–	–	17
9	3	3	7	12	–	3	–	–	–	–	–	–
10	–	–	–	–	63	50	–	–	–	–		3
11	–	–	–	–	2	–	–	–	–	–	–	19
12	–	–	–	–	–	2	–	–	–	–	–	–
13	–	11	–	–	4	40	–	–	–	–	–	–
14	–	–	–	–	3	–	–	–	–	–	–	–
15	–	–	–	–	–	–	–	–	–	–	–	–
16	4	4	21	–	–	–	–	–	–	–	–	–
17	–	–	28	–	–	–	–	–	–	–	–	3
18	5	5	18	–	–	–	–	–	–	–	–	17
19	–	–	27	8	–	–	–	–	–	–	–	–
20	–	–	3	3	–	–	–	–	–	–	–	5
21	–	–	–	–	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	–	–
25	–	–	–	–	–	–	–	–	–	–	–	7
26	–	–	–	8	–	–	–	–	–	–	–	–
27	–	–	–	–	–	–	–	–	–	–	–	–
28	–	–	–	–	–	1	–	–	–	–	–	–
29	–	–	–	18	–	–	–	–	–	–	–	–
30	–	–	–	2	–	–	–	–	–	–	–	6
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	51	62	106	72	133	166	–	–	–	–	–	77

1966

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	10	20	–	–	–	–	–	–	–	–	–	48
2	–	1	–	–	–	16	–	–	–	–	–	–
3	–	92	–	–	–	8	–	–	–	23	–	24
4	–	–	6	–	–	–	–	–	–	17	–	–
5	–	3	13	–	–	–	–	–	–	2	–	11
6	–	–	–	–	19	5	–	–	–	8	–	11
7	–	–	18	–	–	–	–	–	–	–	–	–
8	–	–	–	–	–	–	–	6	–	–	25	21
9	–	–	–	–	4	–	–	–	–	–	18	5
10	–	3	–	–	–	–	–	–	–	–	4	3
11	–	–	–	–	63	–	–	–	–	–	1	–
12	–	–	–	–	–	–	–	–	–	7	–	–
13	–	–	–	–	–	–	–	–	–	3	–	19
14	–	–	–	21	–	–	–	–	–	–	28	54
15	15	–	–	11	–	–	–	–	–	–	–	–
16	–	16	–	17	8	–	–	–	–	–	–	–
17	11	40	24	–	–	30	–	–	–	–	1	–
18	7	9	2	28	–	25	–	–	–	–	–	–
19	9	–	55	4	–	–	–	–	–	–	–	7
20	11	–	–	–	–	–	–	16	–	–	–	–
21	–	–	19	–	–	8	–	–	–	–	–	57
22	21	–	–	–	3	–	–	–	–	–	–	36
23	–	–	–	13	–	–	–	–	–	30	–	1
24	–	7	8	–	27	–	–	–	–	1	–	–
25	–	–	3	46	26	–	42	–	–	–	–	–
26	–	7	–	–	4	–	–	–	–	–	–	–
27	–	–	–	–	2	–	–	–	–	–	–	–
28	19	3	75	37	–	–	–	–	–	–	–	–
29	9	–	7	–	–	–	–	–	–	21	8	
30	–	–	–	45	–	–	–	–	–	–	–	–
31	–	–	–	–	–	–	–	–	–	–	–	20
Σ	112	201	230	222	156	92	42	22	–	60	129	325

1967

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	5	–	–	–	–	–
2	10	26	–	3	–	–	3	–	–	–	–	–
3	–	–	–	6	–	–	7	–	–	–	–	–
4	–	18	–	–	10	–	–	–	–	–	–	–
5	–	–	–	–	5	2	–	–	–	7	–	–
6	–	20	–	–	–	–	–	–	–	–	–	–
7	7	4	–	16	–	1	–	–	–	35	2	–
8	–	–	–	10	5	4	7	–	–	–	–	–
9	6	–	–	9	–	–	–	–	–	–	–	12
10	–	–	–	10	2	–	6	7	–	–	–	–
11	11	–	10	–	12	–	–	–	–	–	–	8
12	–	–	6	29	27	7	–	4	–	–	–	3
13	–	–	–	4	–	–	7	–	–	–	–	–
14	20	–	–	–	–	–	6	–	–	–	–	–
15	30	–	–	–	–	–	6	–	–	–	–	–
16	25	–	–	–	–	2	–	–	–	–	–	–
17	6	–	–	–	–	4	–	–	–	–	–	–
18	8	–	–	–	6	7	–	–	4	–	–	–
19	–	–	–	–	26	20	2	–	–	–	–	–
20	–	–	–	–	4	–	5	–	–	–	110	–
21	–	–	–	16	–	2	–	–	–	–	8	–
22	–	–	–	–	10	–	252	–	–	–	–	12
23	–	–	–	6	–	2	178	9	–	–	–	2
24	8	–	10	–	–	4	120	–	–	–	–	–
25	26	–	–	–	–	5	2	–	6	–	–	–
26	1	–	2	–	–	–	–	–	1	–	–	–
27	3	–	3	–	7	–	3	–	–	–	–	–
28	–	–	–	–	–	2	–	–	–	–	–	–
29	–	–	–	–	14	–	–	–	–	–	–	–
30	15	–	–	–	–	–	–	–	–	–	–	6
31	–	–	3	–	–	–	–	–	–	–	–	8
Σ	176	68	34	109	128	62	609	20	11	42	120	51

Table 4-4 RECORD OF DAILY RAINFALL

1960

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	21	16	–	–	–	–	6	–	–	–	6
2	–	–	–	10	4	18	–	20	–	–	–	–
3	–	–	–	–	6	–	–	–	–	–	–	–
4	–	13	–	5	–	–	–	15	–	–	–	–
5	–	–	–	–	–	–	–	–	–	–	8	5
6	–	–	–	–	6	–	13	–	–	–	–	–
7	3	–	–	5	10	51	–	–	18	–	–	–
8	25	10	–	9	–	3	–	–	–	–	–	–
9	9	7	–	–	–	–	45	–	–	–	–	–
10	–	3	–	–	6	–	–	–	–	–	–	–
11	–	–	–	35	–	–	75	–	–	–	–	–
12		–	–	9	–	–	16	–	–	–	19	9
13	–	–	–	–	–	–	9	–	–	–	–	2
14	–	–	–	–	36	–	–	–	–	–	–	
15	–	–	–	–	–	–	–	–	–	–		
16	–	–	15	15	–	–	2	–	–	–	–	–
17	–	–	–	–	11	–	–	–	–	30	14	–
18	–	–	–	–	31	–	–	–	–	2	–	–
19	–	32	–	–	25	–	–	–	27	–	–	–
20	–	5	–	–	–	–	–	9	–	–	–	–
21	–	–	–	–	3	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	2	–	–	–
23	45	–	–	–	30	–	–	–	9	–	9	63
24	–	–	–	–	–	–	–	–	–	–	–	–
25	–	27	–	–	5	–	–	–	–	–	–	–
26	9	4	–	–	–	–	–	–	–	–	3	32
27	4	–	20	–	–	39	19	–	–	–	–	–
28	10	–	15	–	32	–	–	–	–	–	14	12
29	5	–	–	–	–	14	–	5	–	–	40	–
30	11	–	–	6	–	16	–	–	–	–	5	–
31	15	–	–	–	–	–	–	7	–	–	–	–
Σ	136		66		225		179		56		112	
		142		94		141		62		32		129

1961

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	23	–	–	–	–	–	–	16	/
2	–	–	10	–	28	–	–	–	–	–	–	/
3	–	6	7	–	–	–	–	–	–	–	–	/
4	–	–	–	–	–	–	–	–	–	–	–	/
5	–	–	–	–	–	–	–	–	–	–	–	/
6	3	50	4	–	–	–	–	–	–	–	15	/
7	–	5	–	125	–	–	22	–	–	–	–	/
8	–	4	–	–	–	–	–	–	–	–	–	/
9	–	17	–	–	–	–	–	–	–	–	68	/
10	–	–	–	–	–	–	–	–	–	–	–	/
11	3	50	–	–	–	–	–	–	–	–	–	/
12	42	2	–	–	–	–	–	–	–	–	–	/
13	2	3	114	–	26	–	–	–	–	–	5	/
14	–	6	2	–	–	–	–	–	–	–	–	/
15	24	–	–	–	–	–	–	–	–	–	–	/
16	–	–	–	–	–	60	–	–	–	–	–	/
17	25	–	9	33	–	2	–	–	–	–	3	/
18	27	–	–	–	10	–	–	–	–	–	–	/
19	–	–	–	12	–	–	–	–	–	–	–	/
20	38	–	16	6	2	42	–	–	–	–	–	/
21	7	18	3	–	–	10	–	–	–	–	2	/
22	–	14	15	–	–	–	–	–	–	–	2	/
23	–	3	–	–	23	3	–	–	–	–	–	/
24	–	–	–	–	–	10	–	–	–	–	–	/
25	31	–	–	–	–	–	–	–	–	–	82	/
26	–	–	–	–	–	64	–	–	5	–	–	/
27	–	–	–	–	–	10	–	–	–	–	–	/
28	–	–	–	–	–	36	–	–	–	–	38	/
29	–	–	–	–	–	20	–	–	41	–	35	/
30	31	–	–	–	–	–	–	–	–	–		/
31	6	–	–	–	–	–	–	51	–	6	–	/
Σ	239		180		89		22		46		176	
		178		203		257		51		6		

1962

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	20	/	–	–	–	–	5	34
2	6	–	–	26	–	/	17	–	–	–	–	–
3	–	2	–	9	7	/	–	–	–	–	3	–
4	–	–	–	11	2	/	6	–	–	–	–	10
5	3	–	–	–	3	/	6	–	–	2	12	9
6	–	17	8	2	–	/	5	–	–	3	–	15
7	–	23	2	12	12	/	15	13	–	–	–	15
8	20	9	–	–	–	/	–	4	–	–	–	5
9	–	–	–	15	14	/	7	–	–	–	6	–
10	–	6	–	–	–	/	3	–	–	–	40	–
11	–	–	–	–	18	/	5	–	–	5	–	18
12	–	25	–	11	–	/	–	–	–	–	42	5
13	–	–	19	–	–	/	24	–	–	10	–	–
14	–	–	5	2	–	/	10	–	–	–	–	–
15	20	6	20	–	–	/	–	7	–	22	–	5
16	9	–	–	18	–	/	39	–	–	–	–	–
17	–	–	–	25	8	/	–	–	–	–	–	–
18	–	5	–	3	–	/	–	9	20	–	–	–
19	–	1	18	4	2	/	–	–	11	–	3	24
20	–	2	–	–	–	/	–	–	–	–	4	30
21	–	–	18	27	–	/	–	9	–	–	13	7
22	–	–	2	–	3	/	–	–	–	–	–	–
23	–	–	41	–	9	/		4	–	–	30	–
24	–	–	6	14	4	/		2	–	–	17	–
25	–		–	–	–	/		2	–	–	–	–
26	50	22	16	–	–	/	–	–	–	–	14	37
27	25	19	8	–	19	/		–	–	–	3	–
28	–	–	2	–	–	/	–	–	–	–	24	2
29	11	–	–	–	–	/	–	4	–	9	4	–
30	–	–	–	6	–	/	–	–	–	6	–	–
31	–	–	20	–	–	–	–	–	–	–	–	–
Σ	144		183		121		137		31		220	
		137		185				54		57		216

1963

Basin: Walanae Station: Takalala

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	3	–	–	–	–
2	–	–	–	–	5	–	–	–	–	–	–	–
3	–	–	–	5	5	–	–	29	–	–	–	–
4	–	5	–	–	–	–	–	–	–	–	–	–
5	–	–	11	–	45	–	–	1	–	–	–	–
6	–	–	–	–	–	5	–	–	–	–	–	–
7	–	–	–	–	–	–	–	–	–	–	–	–
8	–	–	–	–	–	–	–	–	–	–	–	–
9	9	–	–	2	–	–	–	2	–	–	–	16
10	–	–	–	3	68	–	–	3	–	–	–	–
11	–	–	27	–	–	–	–	–	–	–	–	3
12	–	18	3	–	–	3	–	–	–	–	–	–
13	–	–	–	–	–	–	5	–	–	–	–	–
14	–	–	–	–	–	–	–	–	–	–	–	–
15	32	–	–	–	–	–	4	–	–	–	–	9
16	–	4	9	–	–	–	–	–	–	–	–	–
17	–	–	–	17	–	25	–	–	–	–	–	–
18	–	5	–	7	–	50	–	–	–	–	–	–
19	2	32	47	–	–	3	–	–	–	–	–	–
20	–	10	–	–	–	–	–	–	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	–	–
22	–	7	2	–	–	–	–	–	–	–	–	–
23	–	5	–	–	–	–	–	–	–	–	–	3
24	–	–	–	–	–	–	–	–	–	–	–	7
25	–	–	–	–	10	–	–	–	–	–	–	–
26	–	–	8	–	–	–	–	–	–	–	–	–
27	–	18	3	–	–	–	–	–	–	–	–	9
28	9	–	–	–	11	7	–	–	–	–	–	–
29	12	–	3	–	–	–	2	–	–	–	–	–
30	–	–	–	–	–	–	3	–	–	–	–	20
31	–	–	–	–	–	–	–	–	–	–	–	18
Σ	64		113		144		14		–		–	
		104		34		102		38		–		85

Table 4-5 RECORD OF DAILY RAINFALL

1972

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	16	–	3	–	–	–	–	–	–	–	–	8
2	27	8	6	33	8	–	–	–	–	–	–	–
3	18	2	–	17	–	–	–	–	–	–	–	23
4	–	–	–	–	–	–	–	–	–	–	–	5
5	6	–	–	–	2	–	–	–	–	–	–	–
6	41	–	–	–	4	–	–	–	–	–	–	–
7	16	8	–	–	–	–	–	–	–	–	–	–
8	53	–	–	–	3	–	–	–	–	–	–	–
9	9	–	–	12	21	–	3	–	–	–	–	2
10	7	–	–	6	32	–	–	–	–	–	10	6
11	6	3	3	1	37	–	–	–	–	–	–	–
12	12	–	4	–	50	8	1	–	–	–	–	6
13	18	18	17	–	–	–	3	–	–	–	–	11
14	1	12	–	–	–	–	–	–	–	–	–	2
15	2	8	–	–	50	–	–	–	–	–	–	37
16	5	–	–	–	–	–	–	–	–	–	–	10
17	–	–	5	–	–	–	–	–	–	–	1	–
18	–	11	–	–	–	–	–	19	–	–	–	–
19	10	4	–	–	–	–	–	–	–	–	–	–
20	–	–	–	14	–	1	–	–	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–
23	3	8	–	1	–	–	–	–	–	–	–	–
24	39	29	–	–	–	–	–	–	–	–	–	26
25	2	–	–	–	–	–	–	–	–	–	1	24
26	–	3	–	–	–	–	–	–	–	–	–	35
27	–	7	8	1	–	–	–	–	–	–	–	10
28	–	10	14	7	–	–	–	–	–	–	–	–
29	–	3	–	20	–	–	–	–	–	–	9	–
30	–	–	–	–	–	–	–	2	–	–	–	–
31	–	–	4	–	–	–	–	–	–	–	–	–
Σ	291		64		207		7		–		21	
		132		112		9		21		–		205

1973

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	11	–	–	–	–	54	4	30	–	46	26	–
2	26	–	1	67	6	12	37	24	–	–	14	–
3	5	–	–	4	5	–	37	5	–	2	–	39
4	8	22	–	23	–	–	1	9	–	–	5	–
5	35	32	–	5	–	54	23	–	7	–	7	3
6	–	–	5	34	–	–	26	–	1	1	–	–
7	20	–	–	–	38	–	74	4	–	–	–	–
8	42	–	19	–	36	14	–	22	–	–	–	–
9	11	7	–	–	–	9	–	6	17	–	–	–
10	–	1	–	–	–	13	21	–	20	–	–	–
11	–	21	13	32	–	35	–	–	20	–	–	–
12	2	–	7	–	–	–	–	–	–	–	–	–
13	27	–	–	–	–	36	–	–	11	–	–	–
14	–	8	–	–	–	11	15	–	–	–	–	–
15	–	86	1	9	–	–	5	–	–	–	1	–
16	12	39	–	–	63	–	3	–	18	–	–	–
17	54	–	3	–	73	–	3	–	20	3	–	–
18	6	20	3	80	–	–	4	2	4	–	–	–
19	–	11	4	27	–	4	7	25	3	–	–	–
20	–	–	–	3	11	–	–	9	6	–	63	7
21	–	–	10	1	16	–	–	18	9	10	52	30
22	–	–	31	7	46	5	–	7	–	5	16	–
23	–	–	–	–	5	21	–	–	15	–	83	5
24	–	32	–	–	7	24	–	–	58	–	–	1
25	–	–	–	–	–	–	–	–	2	–	10	2
26	11	–	–	–	16	12	–	–	–	15	–	13
27	–	–	–	–	–	14	–	–	–	–	–	–
28	–	–	1	–	–	–	31	–	9	–	–	–
29	–	–	–	–	–	5	–	–	–	2	–	–
30	–	–	–	24	–	1	–	–	16	–	24	2
31	–	–	–	–	17	–	4	–	–	28	–	1
Σ	270		98		339		295		236		301	
		279		316		324		161		112		103

1974

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	5	–	3	–	–	–	–	14	2	12	–	1
2	1	–	4	–	–	–	–	4	5	–	–	3
3	2	–	46	–	–	–	–	4	–	–	–	–
4	–	4	–	83	–	–	–	–	5	–	–	–
5	–	–	19	–	34	–	–	–	8	–	–	–
6	28	–	–	12	–	–	–	–	4	–	–	–
7	37	–	–	–	–	–	–	–	51	7	–	–
8	50	–	–	25	–	–	–	–	5	9	1	–
9	75	17	–	–	1	–	–	–	24	–	2	–
10	4	–	–	–	1	–	–	–	3	34	33	–
11	21	8	3	–	74	–	1	–	10	–	–	–
12	–	14	9	–	5	–	10	–	1	–	–	1
13	–	9	15	1	–	–	4	–	10	4	–	–
14	–	2	–	–	–	–	–	–	–	33	–	–
15	–	6	2	–	–	–	–	–	5	8	–	9
16	2	2	–	9	20	24	–	–	4	–	1	17
17	–	2	28	10	–	5	8	–	–	–	8	2
18	15	8	42	8	5	8	21	–	–	20	6	4
19	–	–	24	–	–	32	–	–	–	12	–	1
20	1	–	–	–	–	13	39	–	–	–	–	–
21	–	–	2	–	–	–	–	18	–	–	4	–
22	–	–	–	–	9	8	–	–	–	9	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	2	–
25	43	–	–	–	8	–	–	–	–	–	7	–
26	3	29	–	–	–	–	3	–	1	31	2	4
27	–	2	–	–	7	–	4	–	–	18	–	–
28	–	46	–	–	1	–	3	–	–	–	–	16
29	–	–	–	–	–	–	17	–	7	–	5	–
30	–	–	–	–	–	–	20	–	3	–	11	–
31	–	–	2	–	–	–	15	1	–	–	–	8
Σ	287		199		165		163		80		86	
		149		148		90		23		262		66

1975

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	4	–	–	–	–	–	17	–	5	–
2	–	–	16	–	15	11	–	–	2	–	–	–
3	–	9	1	–	–	26	–	–	–	–	1	–
4	–	1	6	–	–	14	18	–	2	84	–	–
5	–	–	–	4	8	5	–	–	–	1	–	–
6	–	–	23	–	20	11	4	–	10	–	–	–
7	–	3	1	–	7	13	2	–	12	–	10	–
8	–	2	–	31	–	–	–	3	5	17	–	–
9	–	–	–	11	–	14	–	–	13	–	–	–
10	–	3	–	–	9	–	11	6	34	–	34	–
11	–	9	–	6	–	–	6	77	1	–	–	2
12	–	–	–	34	2	14	17	7	3	–	–	20
13	22	–	–	–	–	4	6	2	19	11	–	–
14	–	–	–	–	28	–	36	–	8	–	–	9
15	15	–	–	16	8	–	–	–	–	–	–	19
16	8	–	–	–	–	37	2	–	5	6	–	5
17	–	–	–	42	–	2	3	–	–	7	15	4
18	1	–	5	–	2	15	–	2	–	–	–	38
19	–	–	–	13	46	19	–	–	–	–	–	15
20	–	–	41	4	10	–	12	–	–	5	–	9
21	–	–	–	19	–	–	–	–	–	12	–	–
22	13	–	–	–	8	–	13	–	–	–	–	–
23	–	–	–	–	11	–	36	–	26	–	–	4
24	–	–	–	–	–	–	10	–	–	–	–	–
25	–	6	9	–	2	–	51	–	–	8	8	–
26	–	–	18	–	16	–	–	–	–	–	–	–
27	7	–	–	–	17	2	–	–	11	1	6	14
28	–	6	–	5	2	–	5	–	–	4	–	–
29	1	–	–	14	8	–	8	7	–	5	–	1
30	–	–	–	–	1	–	–	7	2	–	4	5
31	–	–	–	–	–	–	–	8	–	–	–	4
Σ	67		124		220		240		170		83	
		39		199		187		119		161		149

Table 4-6 RECORD OF DAILY RAINFALL

1968

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	–	–	–
2	–	5	–	17	–	–	15	–	–	–	–	4
3	–	–	–	–	2	9	–	–	–	4	–	–
4	35	–	–	–	–	–	–	–	–	–	3	–
5	–	–	–	11	–	–	–	15	–	–	–	37
6	3	–	–	–	3	–	1	–	–	–	–	–
7	–	1	2	–	7	–	–	–	–	–	5	–
8	–	10	20	–	15	–	–	8	–	–	–	3
9	8	–	75	–	–	7	–	3	–	–	–	–
10	–	–	31	17	–	19	19	–	–	–	–	21
11	3	–	–	–	–	3	–	–	–	–	–	9
12	7	8	72	–	–	23	–	33	–	–	–	–
13	35	5	38	–	–	1	9	–	7	–	–	2
14	38	–	4	–	–	17	–	–	–	–	25	25
15	75	–	–	–	–	–	–	–	–	–	4	–
16	23	–	–	–	–	16	–	–	–	–	–	8
17	8	–	14	–	–	16	9	–	10	10	–	–
18	4	–	16	–	12	3	–	–	–	–	–	–
19	25	55	73	–	–	8	–	–	–	–	–	–
20	20	–	232	–	20	1	2	–	–	–	–	–
21	18	27	–	–	–	2	5	–	–	18	–	–
22	19	–	7	–	7	5	–	–	–	–	–	–
23	17	–	8	3	–	–	–	–	–	–	–	–
24	4	–	10	18	19	15	6	9	–	–	–	20
25	–	–	25	–	5	4	5	–	–	–	–	–
26	–	32	42	–	–	6	68	–	–	–	–	15
27	–	8	–	–	5	6	1	6	–	20	–	6
28	–	–	–	–	17	–	–	–	–	42	–	–
29	11	–	–	–	28	–	–	6	–	3	15	–
30	–	–	15	–	3	–	–	–	–	9	–	2
31	–	–	13	–	–	–	–	–	–	–	–	–
Σ	353		697		143		140		17		52	
		151		66		161		80		106		155

1969

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6	/	/	/	/	/	/	/	/	–	–	–
2	6	/	/	/	/	/	/	/	/	–	–	–
3	–	/	/	/	/	/	/	/	/	–	–	–
4	–	/	/	/	/	/	/	/	/	–	–	–
5	–	/	/	/	/	/	/	/	/	–	–	–
6	4	/	/	/	/	/	/	/	/	–	–	–
7	–	/	/	/	/	/	/	/	/	–	–	2
8	–	/	/	/	/	/	/	/	/	–	–	13
9	–	/	/	/		/	/	/	/	–	–	–
10	–	/	/	/	/	/	/	/	/	–	10	–
11	–	/	/	/	/	/	/	/	/	–	–	–
12	–	/	/	/	/	/	/	/	/	–	–	–
13	–	/	/	/	/	/	/	/	/	–	3	–
14	–	/	/	/	/	/	/	/	/	–	–	–
15	21	/	/	/	/	/	/	/	/	–	–	19
16	40	/	/	/	/	/	/	/	/	–	–	9
17	–	/	/	/	/	/	/	/	/	–	–	9
18	–	/	/	/	/	/	/	/	/	–	–	13
19	–	/	/	/	/	/	/	/	/	–	–	40
20	–	/	/	/	/	/	/	/	/	–	–	27
21	15	/	/	/	/	/	/	/	/	5	–	–
22	–	/	/	/	/	/	/	/	/	1	–	–
23	–	/	/	/	/	/	/	/	/	1	–	13
24	–	/	/	/	/	/	/	/	/	26	–	6
25	–	/	/	/	/	/	/	/	/	–	6	–
26	–	/	/	/	/	/	/	/	/	–	15	–
27	–	/	/	/	/	/	/	/	/	–	–	4
28	–	/	/	/	/	/	/	/	/	–	–	13
29	–	–	/	/	/	/	/	/	/	–	–	7
30	–	–	/	/	/	/	/	/	/	–	5	–
31	–	–	/	–	/	–	/	/		–	–	–
Σ	92										39	
										33		175

1970

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	–	–	–	16	3	–	–	/	/	/	–	/
2	–	–	–	–	–	23	–	/	/	/	–	/
3	–	8	–	–	–	21	3	/	/	/	–	/
4	2	–	–	–	7	9	7	/	/	/	1	/
5	3	–	–	–	–	14	26	/	/	/	–	/
6	–	–	–	–	–	7	–	/	/	/	4	/
7	–	–	3	–	–	10	–	/	/	/	–	/
8	–	–	–	5	–	15	–	/	/	/	–	/
9	–	–	–	–	–	–	13	/	/	/	–	/
10	3	–	–	–	–	–	–	/	/	/	–	/
11	–	–	–	–	–	–	–	/	/	/	–	/
12	–	–	–	13	–	–	–	/	/	/	–	/
13	–	–	–	10	–	–	–	/	/	/	–	/
14	–	–	–	7	–	–	10	/	/	/	–	/
15	–	–	–	–	15	–	21	/	/	/	–	/
16	–	–	47	–	20	–	–	/	/	/	–	/
17	–	–	–	–	–	–	–	/	/	/	–	/
18	–	–	–	–	–	–	–	/	/	/	8	/
19	–	–	–	–	–	–	–	/	/	/	–	/
20	–	–	–	–	–	–	65	/	/	/	–	/
21	–	–	–	–	–	35	–	/	/	/	49	/
22	–	–	–	–	–	38	–	/	/	/	–	/
23	–	–	–	–	66	–	–	/	/	/	–	/
24	–	–	–	–	–	10	–	/	/	/	–	/
25	–	–	–	3	–	12	–	/	/	/	–	/
26	–	–	–	–	2	3	–	/	/	/	19	/
27	–	–	–	–	–	–	–	/	/	/	31	/
28	–	–	–	22	–	–	–	/	/	/	–	/
29	–	–	–	94	–	–	–	/	/	/	–	/
30	–	–	1	50	–	–	–	/	/	/	–	/
31	–	–	–	–	–	–	–	/	/	/	–	/
Σ	13		51		113		125				112	
		8		230		197						

1971

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	–	–	1	3	10	–	3	–	–	49	–	–
2	19	–	–	–	10	–	–	–	–	–	–	–
3	–	–	–	–	15	–	–	–	9	–	–	–
4	–	15	–	–	–	12	–	–	–	–	–	32
5	–	–	–	–	–	–	–	–	–	–	–	–
6	–	–	–	–	–	–	57	–	3	–	14	–
7	–	–	–	–	41	–	1	–	38	–	–	–
8	–	–	–	–	8	15	–	–	–	–	–	–
9	–	–	–	–	–	–	1	37	–	–	–	–
10	–	–	4	–	12	20	–	–	–	–	–	–
11	–	–	–	–	4	–	–	–	8	–	–	–
12	–	–	4	–	–	1	–	–	–	–	–	–
13	–	–	5	–	6	2	–	–	–	34	11	–
14	19	–	6	–	–	15	–	–	–	–	–	–
15	10	–	8	5	–	–	–	–	–	–	–	–
16	–	–	5	–	–	–	–	–	–	–	–	–
17	–	–	3	–	–	8	29	–	–	–	16	–
18	–	–	–	15	32	55	–	–	–	–	–	–
19	–	–	4	10	–	–	2	–	–	–	–	–
20	–	–	5	–	8	–	–	–	–	–	–	8
21	–	–	1	7	10	–	–	–	–	15	4	–
22	–	–	–	–	–	36	–	–	–	–	–	–
23	–	–	2	–	–	–	–	–	29	11	–	–
24	–	19	–	–	–	–	–	–	–	–	–	–
25	–	9	–	–	–	3	–	–	1	–	–	–
26	–	17	–	–	–	7	15	–	20	–	5	–
27	–	1	2	–	–	7	38	–	22	–	–	–
28	–	2	–	–	32	–	8	85	–	–	–	–
29	–	–	2	–	–	8	12	–	17	–	–	–
30	–	–	3	–	–	–	–	72	23	–	5	18
31	–	–	–	–	–	–	–	–	–	–	–	25
Σ	48		55		188		166		162		55	
		63		40		189		144		117		83

Table 4 - 7 RECORD OF DAILY RAINFALL

1964

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	122	7	–	–	–	5	8	–	–
2	1	–	18	–	25	–	–	–	–	35	25	–
3	–	51	–	–	–	–	115	30	20	4	–	–
4	–	2	–	–	26	–	–	–	20	–	–	–
5	5	–	–	–	–	–	–	–	23	72	–	3
6	–	20	–	–	–	25	60	–	–	–	–	15
7	–	28	–	–	36	–	–	–	–	–	–	–
8	15	–	–	11	39	30	–	–	–	–	–	50
9	7	–	23	–	4	10	–	–	7	–	–	3
10	–	–	9	–	–	–	9	–	16	–	–	–
11	2	–	11	–	21	–	7	–	10	–	–	–
12	–	–	–	–	–	–	–	–	–	6	5	–
13	3	–	68	–	–	–	20	–	–	3	–	–
14	1	–	–	6	–	–	4	–	17	–	–	–
15	5	–	–	–	–	24	3	–	–	2	–	–
16	–	–	–	10	–	–	15	–	–	–	5	–
17	1	9	–	8	–	6	–	–	5	–	–	–
18	48	–	6	12	–	–	–	–	–	–	–	–
19	–	24	–	–	–	–	–	–	–	49	–	–
20	2	4	–	20	–	–	25	–	–	30	7	–
21	13	9	–	–	–	–	–	–	–	7	2	11
22	35	–	–	–	–	–	–	55	–	–	–	3
23	–	–	–	–	–	–	–	–	–	–	–	–
24	1	–	–	–	–	–	–	–	–	5	–	14
25	–	–	–	–	–	–	–	80	18	–	–	–
26	–	72	–	–	–	–	–	–	–	18	45	–
27	6	–	–	9	–	–	10	–	–	–	10	–
28	–	5	–	16	–	–	–	–	–	–	–	16
29	–	13	–	–	–	–	11	–	3	–	–	–
30	–	–	11	–	–	–	–	–	–	5	30	–
31	–	–	65	–	–	–	–	47	–	85	–	–
Σ	145	237	211	214	158	95	279	212	162	356	84	115

1965

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	7	–	–	–	–	/	14	–
2	–	–	–	–	4	–	–	–	–	/	5	–
3	–	–	–	–	11	–	–	–	–	/	25	–
4	–	–	–	–	10	–	–	–	–	/	–	–
5	–	–	2	–	12	–	–	–	–	/	–	47
6	–	–	–	–	–	–	–	–	7	/	–	4
7	–	–	–	–	6	11	–	2	–	/	–	–
8	–	–	–	–	–	8	–	–	–	/	–	–
9	–	–	–	–	–	5	–	–	–	/	–	–
10	–	–	–	–	60	26	–	–	–	/	23	–
11	–	–	–	–	5	3	–	8	–	/	18	–
12	7	–	–	–	–	–	–	–	–	/	1	–
13	48	–	–	–	–	–	–	–	–	/	–	–
14	–	–	–	–	–	–	–	–	–	/	–	–
15	–	–	14	3	–	–	–	–	–	/	–	–
16	5	45	30	25	3	–	–	–	–	/	–	–
17	–	–	28	2	3	–	–	–	–	/	–	–
18	9	–	41	–	16	–	–	–	–	/	–	–
19	4	9	37	5	–	–	–	–	–	/	–	–
20	–	3	5	–	–	–	–	–	–	/	–	–
21	–	–	–	–	–	–	–	–	–	/	–	–
22	–	25	1	–	–	–	22	–	–	/	–	–
23	–	9	–	–	–	–	–	–	–	/	–	–
24	–	–	14	–	–	–	–	–	–	/	–	–
25	–	–	2	–	–	–	–	–	–	/	–	–
26	13	–	–	23	1	5	–	–	–	/	–	–
27	–	–	–	9	4	–	–	–	–	/	–	–
28	–	–	–	–	4	21	–	–	–	/	–	–
29	–	–	–	–	–	5	–	–	–	/	12	–
30	–	–	–	11	–	–	–	–	–	/	13	1
31	–	–	–	3	–	–	–	–	–	/	–	–
Σ	86	91	174	81	146	84	22	10	7	111	52	

1966

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	2	–	–	/	49	–	1
2	–	1	–	–	–	5	–	–	/	–	–	–
3	3	16	–	–	–	5	–	–	/	12	–	20
4	–	–	–	–	–	–	–	4	/	–	–	–
5	–	4	–	4	–	–	–	–	/	6	–	1
6	–	–	–	–	–	27	–	–	/	9	–	–
7	–	–	–	–	–	5	–	2	/	–	–	–
8	–	–	–	–	–	–	–	–	/	–	–	–
9	–	–	–	–	–	–	–	5	/	–	–	–
10	–	–	–	–	–	–	–	2	/	–	–	–
11	–	8	–	–	–	–	10	–	/	5	51	–
12	–	–	3	2	–	–	–	–	/	15	1	15
13	24	–	–	6	–	–	–	–	/	5	–	–
14	–	1	–	27	–	–	10	–	/	–	49	8
15	–	–	–	8	–	–	10	–	/	–	–	–
16	–	–	13	–	–	–	–	–	/	–	–	–
17	–	5	–	–	–	17	9	–	/	–	–	–
18	13	8	–	40	–	12	–	–	/	–	7	5
19	11	10	47	9	–	–	–	–	/	–	–	5
20	15	–	–	–	–	–	–	20	/	–	–	–
21	10	–	–	5	4	–	–	–	/	–	–	20
22	–	–	–	7	–	–	–	–	/	–	7	22
23	20	8	–	13	36	–	–	–	/	–	37	4
24	15	60	–	8	42	–	–	–	/	–	2	–
25	10	19	–	–	2	–	12	5	/	–	–	–
26	10	–	–	–	5	–	–	–	/	–	1	–
27	–	–	–	–	–	–	–	–	/	–	–	–
28	–	–	8	–	–	–	–	–	/	–	7	28
29	10	–	20	32	–	–	–	–	/	–	–	–
30	16	–	–	–	–	–	–	–	/	–	–	–
31	17	–	–	–	21	–	–	–	/	–	–	–
Σ	174	140	91	161	110	73	51	38		101	162	129

1967

Basin: Walanae Station: Watan Soppeng

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	10	–	–	–	–	–	10	–	–	–	–	6
2	–	32	–	–	17	–	–	–	–	–	–	–
3	–	4	–	11	–	–	10	–	–	–	–	–
4	–	31	–	–	–	–	2	–	–	–	–	5
5	–	–	–	–	11	–	–	–	–	–	–	–
6	–	43	–	1	–	1	–	–	–	65	–	–
7	–	–	–	–	–	3	–	–	–	49	14	5
8	–	–	–	–	9	–	–	–	–	–	–	9
9	–	–	–	–	–	4	–	–	–	–	–	5
10	–	–	–	35	–	9	9	–	–	–	–	–
11	19	–	2	–	18	–	–	2	–	–	–	–
12	–	–	–	–	–	–	–	22	–	–	–	14
13	–	–	10	–	–	–	2	–	–	–	–	–
14	20	–	–	–	–	–	3	–	–	–	–	–
15	–	44	9	–	–	–	21	–	–	–	–	–
16	25	–	–	–	–	–	–	–	–	–	–	16
17	18	–	–	–	–	4	–	–	–	–	–	–
18	14	–	–	10	6	32	18	–	–	–	–	–
19	–	–	–	–	51	10	6	–	–	–	–	–
20	–	–	–	–	4	19	–	–	–	–	–	–
21	12	–	–	–	–	8	–	–	–	–	–	12
22	–	–	–	–	2	4	16	–	–	–	–	15
23	6	–	–	–	–	3	–	–	–	–	–	55
24	12	–	–	–	–	6	16	–	–	–	–	–
25	–	–	–	–	–	–	5	–	20	–	–	–
26	–	–	–	–	–	4	–	–	–	–	–	–
27	–	19	–	–	8	–	–	–	–	–	7	3
28	–	–	–	–	–	7	–	7	–	–	–	–
29	–	–	–	–	–	–	–	17	–	–	23	–
30	13	–	11	–	–	–	–	–	–	–	–	–
31	–	–	–	–	–	–	–	–	–	–	–	25
Σ	149	173	32	57	126	110	122	48	20	114	44	170

Table 4 - 8 RECORD OF DAILY RAINFALL

1960

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	18	–	–	–	–	–	3	–	–	–	11
2	–	–	–	17	31	6	–	3	–	–	–	1
3	–	5	–	–	30	2	–	3	–	–	–	–
4	–	17	–	55	9	–	–	47	–	–	–	–
5	–	–	22	5	–	–	–	–	–	–	–	1
6	–	–	–	1	–	–	16	–	–	–	–	–
7	–	–	2	–	–	80	27	–	37	–	2	–
8	25	15	–	–	–	1	–	–	–	–	–	–
9	50	19	–	46	–	–	23	–	–	–	–	–
10	–	2	–	–	–	–	75	–	–	–	4	–
11	10	–	–	7	17	–	75	–	–	–	13	–
12	–	–	–	12	–	–	21	–	–	–	–	–
13	–	–	–	2	–	21	15	6	–	–	18	17
14	–	–	–	–	–	5	–	–	–	–	–	–
15	–	4	–	–	–	7	2	–	–	–	–	7
16	–	–	–	2	–	–	–	–	–	–	20	–
17	–	–	–	–	3	1	–	–	–	31	3	–
18	–	–	–	–	56	–	–	–	–	–	–	–
19	–	–	–	140	45	–	–	–	2	–	–	–
20	–	–	–	–	–	–	–	8	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	3	–
22	–	–	–	–	–	–	–	–	–	–	1	–
23	–	–	–	–	62	–	–	–	2	–	–	10
24	–	–	–	–	6	–	–	–	13	–	–	–
25	–	36	–	–	–	–	–	–	–	–	–	–
26	–	4	–	–	–	–	1	–	–	–	–	2
27	42	–	25	–	26	6	42	–	–	–	–	9
28	19	–	–	–	–	25	–	–	–	–	6	10
29	56	35	–	5	29	3	5	7	–	–	57	–
30	39	–	3	–	–	11	–	5	–	–	22	–
31	–	–	–	–	–	–	3	5	–	–	–	–
Σ	244	155	52	292	314	168	305	87	54	31	149	68

1961

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	2	–	–	–	–	–	20	–	
2	–	–	1	–	–	5	–	–	–	15	–	–
3	–	–	11	20	–	–	–	–	–	–	–	–
4	–	–	5	2	–	–	–	–	–	–	–	–
5	2	–	–	3	–	–	–	–	–	–	–	–
6	–	25	27	5	–	–	–	–	–	–	15	–
7	–	–	–	35	–	–	–	–	–	–	–	–
8	–	–	–	5	–	–	4	–	–	–	–	25
9	–	5	–	–	2	–	–	–	–	–	20	23
10	2	22	–	5	–	15	5	–	–	–	5	–
11	–	2	–	2	–	–	–	–	–	–	32	–
12	6	–	–	2	–	–	–	–	–	–	–	–
13	8	83	85	14	8	–	–	–	–	–	5	–
14	–	–	13	–	–	–	–	–	–	–	–	6
15	–	–	–	–	–	–	–	–	2	–	–	
16	8	–	–	–	–	16	–	–	–	–	1	–
17	57	–	–	66	4	4	–	–	–	–	–	–
18	16	–	–	3	–	–	–	–	–	–	–	23
19	73	–	–	90	–	10	–	–	–	–	11	12
20	37	5	10	19	3	18	–	–	–	–	–	19
21	11	20	2	–	–	6	15	–	–	–	2	3
22	–	11	–	–	–	5	–	–	–	–	11	–
23	–	2	–	–	21	2	–	–	–	–	–	–
24	10	–	–	1	–	2	2	–	–	–	–	–
25	15	–	–	9	10	10	–	–	–	–	10	–
26	–	–	–	–	–	–	–	–	–	–	–	–
27	–	–	–	–	–	75	–	–	–	–	2	–
28	–	5	–	–	–	80	4	–	4	–	4	32
29	–	–	5	–	–	45	–	–	44	–	10	–
30	15	–	–	–	35	4	–	28	–	–	9	–
31	6	–	1	–	–	–	–	34	–	60	–	–
Σ	276	180	263	297	83	62	30	75	50	143	157	

1962

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	–	3	11
2	–	–	–	13	55	–	–	–	–	–	–	–
3	–	–	–	2	–	–	–	–	–	–	–	–
4	–	–	–	15	3	–	23	–	–	–	–	6
5	–	11	15	–	16	–	–	–	–	6	–	19
6	–	6	–	–	–	–	9	–	–	41	–	24
7	–	35	–	–	40	–	–	2	–	–	–	51
8	–	4	–	–	–	–	6	22	–	–	4	–
9	–	–	–	–	15	–	8	–	–	–	3	5
10	–	9	–	–	9	–	–	–	–	–	12	–
11	–	–	–	–	–	–	15	–	–	–	–	–
12	–	–	7	13	–	30	–	–	–	–	2	–
13	–	–	103	–	–	22	13	–	–	40	5	–
14	–	–	–	–	–	–	12	–	–	–	–	–
15	–	–	19	–	–	–	18	–	–	10	–	–
16	–	11	–	–	–	–	–	–	–	–	–	–
17	–	2	–	–	10	–	–	–	–	–	56	–
18	–	–	–	10	–	–	–	–	6	–	–	–
19	–	7	–	–	–	–	–	–	28	–	17	–
20	–	4	45	–	–	–	–	9	47	–	–	–
21	–	4	–	–	–	–	–	–	–	–	–	–
22	–	–	59	–	44	–	–	–	–	–	13	–
23	51	–	–	–	4	–	–	–	–	–	–	–
24	4	–	42	–	–	10	–	–	–	–	16	–
25	25	–	–	–	–	16	–	–	–	–	–	–
26	30	–	101	–	–	–	11	6	–	–	36	51
27	31	–	–	–	–	15	–	–	–	3	15	–
28	–	–	–	–	–	–	–	–	–	–	10	–
29	29	–	–	–	–	11	–	–	–	30	10	–
30	–	–	–	–	–	45	–	–	–	5	150	–
31	–	–	75	–	–	–	–	–	–	–	–	–
Σ	170	93	466	53	196	150	110	33	81	135	352	167

1963

Basin: Walanae Station: Watan Soppeng

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	/	–	–	–	–	–	–	–	–
2	–	–	–	/	–	–	–	20	–	–	–	–
3	–	–	–	/	–	–	–	7	–	–	8	–
4	–	9	–	/	–	–	–	–	–	–	–	–
5	–	–	–	/	–	–	–	–	–	–	–	–
6	–	–	–	/	19	6	–	3	–	–	–	3
7	–	–	–	/	23	–	–	–	–	–	23	–
8	–	–	–	/	–	–	–	–	–	–	–	–
9	–	–	–	/	–	–	–	–	–	–	8	22
10	–	–	–	/	–	–	–	4	–	–	–	16
11	–	–	8	/	–	11	–	–	–	–	8	1
12	2	–	4	/	–	–	–	19	–	–	–	–
13	–	12	6	/	–	–	–	–	–	–	3	–
14	10	–	–	/	3	–	–	–	–	–	7	–
15	28	–	–	/	–	–	43	–	–	–	–	–
16	46	15	–	/	–	–	–	–	–	–	–	–
17	–	–	–	/	–	25	–	–	–	–	–	–
18	–	10	13	/	–	48	–	–	–	–	–	–
19	–	11	67	/	–	2	–	–	–	–	–	10
20	–	–	–	/	29	–	–	–	–	–	–	–
21	1	–	–	/	–	–	–	–	–	–	–	–
22	–	–	5	/	–	–	–	–	–	–	–	–
23	–	–	–	/	–	–	–	–	–	–	2	5
24	–	–	–	/	–	–	–	–	–	–	15	–
25	–	6	4	/	–	–	–	–	–	–	19	29
26	–	–	3	/	–	–	–	–	–	–	–	–
27	90	–	5	/	24	–	–	–	–	–	–	–
28	20	25	–	/	–	–	–	–	–	–	25	9
29	–	–	6	/	11	–	–	–	–	–	–	–
30	–	–	10	/	–	–	–	–	–	–	42	–
31	–	–	–	–	–	–	–	–	–	–	–	3
Σ	197	88	131		109	92	43	55	–	–	160	98

Table 4-9 RECORD OF DAILY RAINFALL

1968

Basin: Cenranae Station: Sing Kang (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	74	~	–	25	–	–	–	3	–
2	–	–	–	–	~	–	~	–	–	–	–	17
3	–	–	–	–	~	3	~	–	–	–	–	–
4	–	–	–	–	~	–	~	–	–	–	–	19
5	–	–	–	–	~	2	~	45	–	–	–	4
6	–	–	–	–	~	–	~	–	–	–	–	5
7	–	–	6	–	~	7	~	–	–	–	37	~
8	–	–	5	37	~	–	50	–	–	–	–	~
9	–	–	–	–	~	–	~	41	–	–	–	~
10	–	–	–	–	~	11	13	–	–	–	13	27
11	–	–	–	–	~	3	~	–	–	–	7	7
12	–	–	6	15	~	6	~	–	5	–	–	~
13	3	–	25	–	~	–	~	–	16	–	–	~
14	5	–	6	–	~	74	~	–	–	–	–	3
15	2	–	–	–	~	–	~	–	–	–	–	~
16	~	–	–	–	~	45	24	–	–	–	–	~
17	12	–	49	–	~	–	~	–	–	–	–	~
18	~	–	–	–	11	–	~	–	–	–	–	68
19	17	23	–	–	~	–	~	–	–	–	–	~
20	~	10	27	–	~	46	26	–	–	–	–	~
21	~	2	–	–	~	–	~	–	–	85	–	~
22	~	4	7	12	~	3	35	–	–	–	–	~
23	~	–	–	41	5	–	~	–	–	–	–	~
24	~	–	–	27	~	–	2	17	–	–	–	~
25	~	–	18	–	6	–	~	–	–	–	–	~
26	~	–	1	–	~	–	60	–	–	–	–	~
27	3	–	82	25	10	–	~	–	–	–	–	~
28	~	–	7	–	17	–	8	–	–	–	–	~
29	~	–	20	–	25	6	~	–	–	–	–	~
30	8	–	29	–	~	15	~	–	–	–	42	~
31	~	–	–	–	~	–	~	–	–	29	–	~
Σ	50		288		74		283		21		102	
		39		231		223		103		114		150

1969

Basin: Cenranae Station: Sing Kang (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	15	–	–	28	–	–	–	–	–	–	–	–
2	12	–	–	–	7	–	–	–	–	–	–	–
3	–	–	–	–	–	–	8	–	–	–	–	–
4	–	–	–	8	–	–	10	–	–	–	–	5
5	–	–	–	5	–	–	–	–	–	–	1	–
6	–	–	–	–	–	–	–	–	–	–	32	1
7	–	–	–	–	14	50	–	–	–	–	–	–
8	–	–	58	18	19	–	8	–	–	–	–	–
9	–	–	21	10	–	10	–	14	–	–	–	–
10	–	–	2	–	5	–	–	–	–	–	22	–
11	–	–	–	–	–	–	–	–	–	–	–	–
12	–	–	–	–	3	–	7	–	–	–	–	–
13	–	–	–	–	8	–	–	–	–	–	–	8
14	–	–	–	–	30	–	30	18	–	–	–	–
15	–	5	–	–	7	–	–	–	–	–	–	33
16	10	–	18	–	12	–	–	–	–	–	–	–
17	–	–	–	–	3	–	–	–	–	–	–	–
18	–	–	–	5	–	–	–	83	–	–	–	–
19	–	–	5	–	–	–	–	25	–	–	–	45
20	–	–	–	4	–	–	–	–	–	–	–	35
21	–	–	–	18	17	–	–	–	–	–	–	–
22	–	–	–	–	14	–	–	–	–	–	–	12
23	–	–	–	–	23	–	–	–	–	–	–	–
24	–	12	–	–	29	–	–	–	–	–	–	–
25	–	–	1	7	8	–	–	–	–	–	–	–
26	7	–	–	–	6	–	–	–	–	–	–	–
27	–	–	–	15	–	–	–	–	–	–	–	–
28	–	–	–	7	9	–	–	–	–	–	–	–
29	12	–	–	12	17	–	–	–	6	1	–	–
30	–	–	–	–	–	32	32	–	–	26	–	–
31	–	–	24	–	–	–	–	–	–	–	–	–
Σ	56		129		231		95		6		55	
		17		137		92		140		27		139

1970

Basin: Cenranae Station: Sing Kang (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	26	–	–	60	–	–	–	–
2	–	–	–	–	–	29	3	~	–	–	–	–
3	–	–	–	–	–	18	13	~	–	–	16	–
4	–	–	–	–	44	20	8	~	–	–	1	18
5	–	–	–	–	–	15	–	26	2	–	4	5
6	–	–	–	–	–	24	63	3	–	2	14	–
7	–	–	–	–	–	–	–	~	8	–	–	–
8	–	–	–	16	–	25	–	~	12	–	–	–
9	–	–	–	–	–	–	–	20	–	–	–	–
10	–	–	–	–	27	–	25	~	–	–	5	–
11	–	–	–	–	2	12	–	~	–	–	–	–
12	–	–	25	–	9	41	–	~	–	–	–	–
13	11	–	45	–	13	23	4	~	–	–	2	–
14	–	–	–	–	8	–	–	~	–	–	13	–
15	–	–	–	–	2	11	14	~	10	–	–	–
16	–	–	–	–	39	2	1	~	–	–	–	–
17	15	–	–	34	–	–	14	~	40	–	–	–
18	–	–	–	2	–	–	–	~	45	–	–	–
19	–	–	–	–	–	–	–	25	106	1	4	–
20	–	26	–	–	17	–	–	37	–	5	–	–
21	–	–	–	6	25	–	47	~	–	1	95	–
22	–	–	–	–	–	3	36	~	17	62	–	–
23	–	–	–	–	6	4	43	~	15	12	29	–
24	–	–	–	–	–	–	22	~	51	48	–	–
25	–	–	–	30	–	–	–	~	–	4	–	–
26	–	–	7	–	29	4	–	~	–	–	68	–
27	–	–	3	–	–	12	–	~	–	–	35	–
28	–	–	4	–	9	–	–	~	–	–	–	–
29	–	–	1	–	–	–	–	~	–	–	–	–
30	–	–	3	–	–	2	–	~	–	18	–	–
31	–	–	21	–	–	–	7	~	–	7	–	–
Σ	26		109		256		300		306		295	
		26		88		245		171		160		23

1971

Basin: Cenranae Station: Sing Kang (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	10	–	35	–	–
2	–	–	–	25	36	10	–	–	–	45	–	–
3	–	–	–	–	–	7	–	1	–	–	–	–
4	–	–	–	–	–	–	–	–	–	–	–	–
5	–	–	–	–	–	–	23	–	–	–	–	–
6	–	–	–	–	–	–	13	–	–	–	–	–
7	–	–	–	–	–	13	6	–	–	–	–	–
8	–	–	–	–	5	–	–	3	–	–	–	–
9	–	–	–	10	–	–	–	–	–	–	–	–
10	–	–	–	2	–	–	–	–	–	–	–	–
11	–	–	–	–	23	–	–	–	–	–	–	–
12	–	–	–	17	–	–	–	–	–	–	–	–
13	–	–	5	7	–	–	–	40	–	–	–	–
14	–	–	–	6	–	3	–	20	–	–	–	64
15	–	–	–	–	–	–	–	41	–	–	–	–
16	–	–	–	–	–	–	2	–	18	–	–	–
17	–	–	–	–	12	–	–	–	–	–	–	–
18	–	–	–	–	16	4	5	4	–	–	–	–
19	–	–	–	13	–	–	–	7	–	–	64	–
20	–	–	4	–	–	–	–	2	16	–	17	–
21	–	–	–	25	2	–	–	–	–	–	10	–
22	–	–	–	–	–	35	–	–	19	–	–	–
23	–	–	–	–	–	–	–	–	–	30	18	–
24	–	–	–	–	–	–	–	19	6	15	–	–
25	–	–	–	–	–	38	–	–	–	16	–	–
26	–	–	–	–	–	9	31	–	4	–	–	–
27	3	5	–	–	–	–	15	–	22	5	–	–
28	–	–	–	–	–	–	–	–	–	–	–	–
29	–	–	–	–	10	36	–	–	25	–	–	–
30	–	–	–	2	25	20	–	31	14	10	23	3
31	–	–	–	–	–	–	–	–	–	–	–	5
Σ	3		9		108		95		154		114	
		5		105		198		178		144		72

Table 4 - 10 RECORD OF DAILY RAINFALL

1964

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	15	–	–	–	–	4	–	–
2	–	–	25	–	–	3	–	20	–	81	11	–
3	–	20	–	7	26	–	40	–	11	–	–	10
4	–	–	–	–	15	–	8	–	–	–	7	9
5	–	–	–	47	–	–	–	8	11	–	3	–
6	–	5	–	15	–	–	–	–	–	–	–	7
7	–	3	–	65	2	46	9	–	–	–	–	15
8	–	–	–	2	–	3	–	–	–	–	–	–
9	–	–	6	5	9	4	–	–	12	1	–	–
10	–	–	–	–	–	18	9	–	9	–	–	–
11	–	–	–	6	–	6	6	–	15	–	–	–
12	–	–	–	–	–	–	6	–	–	16	–	–
13	–	–	23	2	–	2	2	–	41	4	–	–
14	6	–	–	–	–	–	11	–	22	–	–	–
15	3	–	–	46	–	–	5	–	–	–	–	40
16	12	–	–	19	4	11	3	–	–	–	–	–
17	8	–	–	4	–	–	–	–	13	–	–	–
18	–	14	–	–	–	–	–	–	–	14	–	–
19	–	25	–	–	–	–	22	–	–	2	–	8
20	4	63	–	–	–	–	3	–	–	–	–	–
21	41	44	16	21	–	–	–	–	–	13	–	4
22	–	–	–	4	–	15	–	–	–	–	–	–
23	3	–	–	–	–	15	–	15	–	3	–	12
24	–	–	–	–	–	–	–	10	–	–	–	–
25	–	–	–	–	–	–	–	–	53	7	–	–
26	–	24	–	21	10	–	28	–	20	–	–	–
27	–	–	10	–	–	–	44	10	–	–	4	8
28	10	8	–	–	–	–	–	13	–	–	–	–
29	–	2	–	–	19	–	14	5	–	13	–	–
30	–	–	–	27	–	–	–	–	–	–	–	–
31	–	–	–	–	–	–	–	3	–	3	–	–
Σ	87	208	80	291	100	123	210	84	207	161	25	113

1965

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	/	–	33	40	–	–	–	–	–	–
2	61	–	/	–	9	–	–	–	–	–	–	–
3	–	–	/	–	–	–	–	–	–	–	–	–
4	–	–	/	–	26	–	–	–	–	–	–	2
5	–	–	/	–	6	–	–	–	–	–	–	–
6	–	–	/	30	–	–	–	–	–	–	–	–
7	–	–	/	–	8	37	3	–	–	–	–	30
8	–	–	/	12	10	15	–	–	–	–	–	–
9	–	–	/	22	–	–	–	–	–	–	–	–
10	–	–	/	–	72	4	–	–	–	–	–	–
11	–	–	/	–	5	13	–	–	–	–	–	–
12	–	–	/	–	15	2	–	–	–	–	–	–
13	7	–	/	–	4	–	–	–	–	–	–	–
14	–	–	/	7	10	–	–	–	–	–	–	–
15	–	–	/	–	17	–	–	–	–	17	–	–
16	–	4	/	–	–	–	–	10	–	–	–	–
17	–	22	/	–	3	–	–	–	–	–	–	–
18	–	3	/	–	–	–	–	–	–	–	–	–
19	–	–	/	4	9	–	–	–	–	–	–	–
20	–	5	/	–	–	–	–	–	–	–	–	–
21	–	–	/	–	–	–	–	–	–	–	–	–
22	–	–	/	–	–	–	–	–	–	–	–	–
23	–	–	/	6	–	–	–	–	–	–	–	–
24	–	16	/	–	–	–	–	–	–	–	–	–
25	–	–	/	–	13	–	–	–	–	–	–	–
26	–	–	/	57	–	–	–	–	–	–	–	–
27	–	–	/	11	14	31	–	–	–	–	–	–
28	–	–	/	–	19	33	–	–	–	5	–	–
29	–	–	/	–	–	3	–	–	–	–	–	–
30	–	–	/	11	–	–	–	–	–	–	–	–
31	–	–	/	–	–	–	–	–	–	–	–	–
Σ	68	50		160	273	178	3	10	–	22		32

1966

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	10	–	–	–	–	–	–	–	26	–	9
2	–	–	–	34	–	9	–	–	–	5	–	–
3	–	–	19	–	–	26	–	–	–	–	–	–
4	–	–	3	4	28	9	–	–	–	3	–	–
5	–	–	6	10	–	–	–	–	–	22	–	–
6	15	–	–	–	–	4	–	–	5	12	–	–
7	–	–	–	–	–	26	–	–	–	–	9	–
8	–	–	–	–	–	19	10	–	–	–	–	60
9	–	–	–	8	–	23	–	–	–	–	–	–
10	–	–	–	–	–	1	2	7	–	–	1	–
11	–	4	5	20	–	–	–	–	–	–	–	–
12	–	–	–	8	–	–	–	–	–	1	–	–
13	–	–	–	5	–	–	–	–	–	–	–	–
14	–	1	–	21	–	–	9	–	–	–	11	12
15	–	–	–	11	–	–	–	–	–	–	–	–
16	–	–	–	9	–	–	–	–	–	–	22	–
17	21	–	–	98	–	68	–	–	–	–	1	–
18	–	66	–	12	–	3	–	–	–	–	–	–
19	–	–	–	3	–	–	–	–	–	–	–	–
20	–	–	8	40	–	–	–	22	–	–	–	–
21	–	–	–	–	–	6	–	1	–	–	–	–
22	–	–	10	7	–	3	–	–	–	–	20	6
23	–	–	–	–	19	2	–	–	–	–	–	–
24	–	–	1	9	–	–	–	–	–	–	3	–
25	–	13	–	7	78	–	–	–	–	–	14	–
26	–	–	–	–	3	–	–	–	–	–	–	–
27	–	–	–	–	–	–	–	–	–	–	43	–
28	–	–	–	2	–	–	–	–	–	–	4	7
29	–	–	–	–	–	–	–	–	2	–	–	–
30	–	–	–	46	–	–	–	–	24	–	–	–
31	11	–	57	–	–	–	–	–	–	–	–	–
Σ	47	94	109	354	128	198	21	30	31	69	128	94

1967

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	2	–	30	–	–	–	–	–
2	–	10	–	–	–	–	–	–	–	–	–	–
3	–	–	–	4	2	–	54	–	–	–	–	–
4	–	16	–	–	–	–	–	–	–	–	–	–
5	–	–	–	–	4	–	–	–	–	–	–	–
6	–	5	–	14	–	–	–	–	–	–	–	–
7	–	–	–	–	4	7	–	–	–	–	–	–
8	–	–	–	–	–	–	–	–	–	–	–	–
9	–	–	–	–	2	–	15	–	–	–	–	2
10	–	–	–	21	–	–	19	–	–	–	–	–
11	–	–	–	–	–	–	6	–	–	–	–	–
12	–	–	–	1	–	–	7	60	–	–	–	–
13	–	–	–	–	–	–	5	–	–	–	–	–
14	–	–	–	–	–	–	–	–	–	–	–	–
15	–	–	–	–	–	–	39	–	–	–	–	–
16	26	–	–	–	12	–	–	–	–	–	–	–
17	–	–	–	–	–	6	2	–	–	–	–	–
18	–	–	–	–	16	42	–	–	–	–	–	–
19	–	–	–	26	3	24	3	–	–	–	–	–
20	–	–	–	3	2	53	–	–	–	–	19	–
21	–	–	–	8	–	20	26	–	–	–	16	–
22	–	–	–	2	8	4	–	–	–	–	–	–
23	–	–	–	18	-9	4	16	–	–	–	–	–
24	40	–	–	–	2	21	–	–	–	–	–	–
25	–	–	–	–	–	51	–	–	3	–	–	–
26	–	–	90	–	–	15	–	–	13	–	–	–
27	–	11	–	–	–	–	–	–	–	13	–	–
28	–	–	–	4	–	–	–	–	–	–	9	–
29	–	–	–	–	–	–	–	20	–	–	–	–
30	10	–	–	3	1	–	–	–	–	–	–	–
31	–	–	25	–	–	–	–	–	–	–	–	–
Σ	76	42	115	104	67	247	222	80	16	13	44	2

Table 4-11 RECORD OF DAILY RAINFALL

1960

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	1	8	/	/	–	/	–	17	–	/	/	1
2	/	/	/	/	15	/	–	10	–	/	/	/
3	/	/	/	/	–	/	18	–	–	/	/	/
4	/	/	/	/	–	/	–	8	–	/	/	/
5	/	/	/	/	9	/	–	/	27	/	/	/
6	/	/	/	/	51	128	9	/	–	/	/	/
7	/	2	/	/	6	12	60	/	64	/	/	/
8	/	/	/	/	–	/	21	/	/	/	/	/
9	9	/	/	/	–	/	29	/	/	/	3	/
10	/	/	/	/	–	/	56	/	/	/	–	/
11	/	/	/	/	5	/	6	/	/	/	–	/
12	/	/	/	/	–	/	12	/	/	/	9	/
13	/	/	/	/	/	29	33	8	/	/	–	/
14	/	/	/	/	2	18	30	/	/	3	5	2
15	58	2	/	/	–	/	2	/	/	–	–	7
16	1	/	/	/	–	/	–	/	/	–	–	/
17	–	/	/	/	3	/	–	/	/	26	–	/
18	71	/	/	/	52	/	2	4	/	/	1	/
19	/	/	/	/	26	/	–	–	2	/	/	/
20	/	/	/	/	13	/	–	9	–	/	/	/
21	/	/	/	/	3	/	–	/	–	/	/	/
22	/	/	/	/	–	/	–	/	6	/	/	/
23	/	/	/	/	8	10	–	/	2	/	/	4
24	/	/	/	/	25	4	4	/	/	/	/	6
25	3	40	/	/	–	–	3	/	/	/	8	1
26	4	/	/	/	4	16	3	/	/	/	/	–
27	5	/	/	/	1	–	21	/	/	/	17	21
28	14	/	/	/	–	21	–	6	/	/	15	/
29	–	/	/	/	18	–	–	12	/	/	45	/
30	2	–	/	/	–	22	–	15	/	/	17	/
31	52	–	/	/	–	–	–	–	–	/	–	/
Σ	220	52			241	250	309	89	101	29	120	42

1961

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	36	11	–	–	–	/	3	–	–
2	–	–	–	41	–	4	–	–	/	–	–	–
3	–	–	15	–	–	–	–	–	/	–	–	16
4	–	–	1	12	–	–	–	–	/	–	15	–
5	–	–	–	–	–	–	–	–	/	–	–	–
6	1	–	7	36	3	–	–	–	/	–	–	8
7	–	23	–	27	–	–	2	–	/	–	–	–
8	–	8	–	6	–	–	3	–	/	–	4	–
9	–	–	–	–	–	–	5	–	/	–	32	–
10	–	34	–	–	–	–	–	–	/	–	–	–
11	–	1	–	4	9	7	2	–	/	–	22	–
12	–	2	–	4	–	2	–	–	/	–	–	10
13	–	7	–	55	13	–	4	–	/	–	–	5
14	–	–	–	–	–	3	7	–	/	–	–	1
15	–	–	–	–	6	2	–	–	/	–	–	–
16	–	–	3	2	–	10	–	–	/	–	–	–
17	19	2	–	–	4	15	–	–	/	–	–	–
18	22	–	–	–	40	14	–	–	/	–	–	21
19	35	–	3	36	–	20	–	–	/	–	–	–
20	9	5	–	59	–	–	–	–	/	–	–	24
21	–	2	–	11	5	8	–	–	/	–	2	–
22	–	10	8	–	2	48	–	–	/	–	–	–
23	–	–	–	1	4	34	–	–	/	–	–	–
24	–	4	–	1	–	8	–	–	/	–	–	–
25	23	–	–	31	16	9	–	–	/	–	–	1
26	–	–	–	–	–	16	–	–	/	1	–	–
27	–	–	–	–	–	10	1	–	/	–	–	–
28	–	–	3	–	32	23	–	–	/	–	–	7
29	4	–	9	–	7	10	–	–	/	–	–	–
30	–	–	1	–	20	–	–	–	/	9	–	27
31	33	–	11	–	–	–	–	–	–	–	–	–
Σ	146	98	61	362	172	243	24	–		13	75	120

1962

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	7	19	–	–	2	–	–	/	6
2	–	–	–	29	–	–	1	–	–	–	/	–
3	–	–	–	6	–	7	–	2	–	–	/	–
4	–	–	–	36	18	–	–	–	2	–	/	–
5	–	–	–	–	2	–	6	–	–	–	/	1
6	–	–	–	17	–	–	9	–	–	9	/	4
7	–	10	–	16	–	–	1	6	–	–	/	12
8	–	–	–	2	–	–	8	32	–	–	/	–
9	–	–	–	–	32	1	2	–	–	–	/	–
10	–	9	–	–	10	–	–	–	–	–	/	7
11	–	–	–	–	–	6	–	1	–	–	/	–
12	–	–	14	15	–	31	–	21	–	–	/	10
13	–	–	37	–	11	13	–	2	–	17	/	–
14	–	–	–	–	3	–	–	–	–	15	/	–
15	9	–	11	–	–	4	–	31	–	10	/	3
16	–	15	–	–	5	–	–	2	–	–	/	1
17	–	–	–	4	–	–	–	32	–	–	/	–
18	–	–	–	1	–	–	3	–	13	–	/	–
19	–	–	2	–	–	–	–	1	3	–	/	–
20	–	3	5	15	1	–	–	–	20	–	/	2
21	–	–	33	2	–	20	–	3	–	–	/	–
22	22	–	24	–	–	6	–	5	–	–	/	–
23	72	–	30	–	–	25	–	2	–	–	/	–
24	5	–	5	–	31	3	–	11	–	–	/	–
25	–	8	48	–	–	6	–	–	–	–	/	–
26	6	–	7	–	14	8	1	2	–	–	/	50
27	7	7	7	–	–	10	–	–	–	–	/	–
28	–	–	–	8	–	30	–	–	–	–	/	–
29	26	–	3	6	–	2	–	6	–	–	/	2
30	–	–	2	14	–	32	–	2	–	7	/	–
31	–	–	15	–	–	–	10	–	–	–	/	–
Σ	147	52	243	178	146	204	41	163	38	58		98

1963

Basin: Cenranae Station: Sing Kang (2)

D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	7	7	/	/	/	–
2	–	–	–	–	–	–	–	13	/	/	/	–
3	–	–	–	1	–	–	–	13	/	/	/	–
4	–	–	–	–	5	–	–	–	/	/	/	–
5	–	–	–	–	17	–	–	8	/	/	/	–
6	–	–	–	–	2	–	–	25	/	/	/	–
7	–	–	43	–	45	–	–	–	/	/	/	–
8	–	–	1	18	3	–	–	–	/	/	/	–
9	–	4	2	3	1	–	–	–	/	/	/	–
10	–	–	–	7	11	–	–	12	/	/	/	10
11	–	4	11	–	–	–	–	–	/	/	/	15
12	–	1	–	–	–	–	–	–	/	/	/	–
13	1	–	4	–	–	6	27	–	/	/	/	–
14	3	–	–	–	1	–	–	–	/	/	/	–
15	2	–	–	–	–	6	–	–	/	/	/	–
16	45	–	16	–	–	–	6	–	/	/	/	–
17	–	–	15	–	–	1	–	–	/	/	/	–
18	–	5	–	–	11	37	–	–	/	/	/	–
19	–	9	4	9	–	12	–	–	/	/	/	–
20	–	4	–	–	3	4	–	–	/	/	/	–
21	–	–	–	–	1	–	–	–	/	/	/	–
22	4	–	1	–	9	30	–	–	/	/	/	–
23	1	10	–	4	–	–	–	–	/	/	/	–
24	–	5	–	–	14	–	–	–	/	/	/	–
25	–	13	2	–	7	–	7	–	/	/	/	–
26	–	6	2	–	4	–	–	–	/	/	/	–
27	2	3	2	–	43	–	–	–	/	/	/	–
28	7	1	–	–	4	–	3	–	/	/	/	–
29	–	–	–	2	16	2	–	–	/	/	/	–
30	–	–	–	–	–	–	14	–	/	/	/	24
31	–	–	–	–	–	–	3	–	–	/	–	–
Σ	65	65	103	44	197	98	67	78				49

Table 4-12 RECORD OF DAILY RAINFALL

1972

Basin: Bila Station: Tanru Tedong (2)

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	8	–	–	–	–	–	–	–	–
2	–	–	–	16	–	–	–	–	–	–	–	16
3	8	–	–	–	4	–	–	–	–	–	–	25
4	3	8	–	–	–	9	–	–	–	–	–	–
5	4	6	–	–	84	–	–	–	–	–	–	–
6	6	–	–	–	–	–	–	–	–	–	–	–
7	13	–	–	–	–	–	1	–	–	–	–	–
8	61	1	–	–	25	–	–	–	–	–	3	4
9	36	–	–	14	17	7	1	–	–	–	–	–
10	8	8	–	–	3	10	3	–	–	–	–	–
11	11	3	–	9	19	12	–	–	–	–	–	–
12	–	14	–	–	2	–	2	–	–	–	–	10
13	4	–	–	52	–	–	–	–	–	–	–	2
14	7	–	–	–	–	–	1	–	–	–	–	–
15	4	–	–	–	2	20	–	–	–	–	–	14
16	5	–	–	–	–	–	1	–	–	–	–	–
17	–	3	–	–	–	–	–	68	–	–	–	–
18	–	–	–	–	–	2	–	–	–	8	–	–
19	–	21	–	–	21	–	–	–	–	–	–	12
20	–	–	2	–	–	–	2	1	–	–	5	–
21	–	–	–	–	–	–	–	–	–	–	1	–
22	–	–	–	1	–	–	–	–	–	–	–	–
23	–	–	–	11	–	–	–	–	–	–	–	–
24	–	8	–	1	–	10	–	–	–	–	4	–
25	–	10	–	9	–	–	–	–	–	–	8	19
26	–	–	3	–	–	–	–	–	–	–	–	–
27	–	–	12	56	11	–	–	–	–	–	–	–
28	–	2	–	46	–	–	–	1	–	–	43	–
29	–	–	–	8	–	–	–	–	–	–	–	–
30	18	–	–	–	–	–	1	–	–	–	–	51
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	186	84	17	231	188	70	12	70	–	8	64	153

1973

Basin: Bila Station: Tanru Tedong (2)

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	13	9	41	30	–	30	–
2	–	–	–	23	2	–	2	24	–	–	–	–
3	–	–	–	6	–	–	–	86	8	–	8	1
4	–	–	–	11	10	34	–	–	–	–	–	–
5	–	–	63	15	3	39	53	4	14	–	14	4
6	4	–	8	110	1	–	20	1	–	–	–	–
7	5	–	–	–	4	–	3	10	10	–	10	–
8	1	–	–	43	–	–	–	62	6	–	6	–
9	–	1	2	1	–	32	9	–	–	–	–	–
10	–	25	–	7	6	–	–	–	8	1	8	–
11	–	26	–	2	13	–	–	–	94	–	94	–
12	–	36	–	–	8	–	–	–	–	–	–	–
13	–	15	7	3	–	5	–	–	2	–	2	–
14	–	24	–	–	–	12	3	–	–	–	–	–
15	–	57	–	27	–	–	–	–	–	–	–	–
16	9	87	–	25	3	–	–	–	–	–	–	–
17	28	–	–	–	–	–	–	–	–	–	–	–
18	15	–	–	–	21	–	–	15	–	–	2	47
19	–	–	–	22	–	33	–	15	2	–	43	1
20	–	–	–	5	6	24	–	45	43	17	–	–
21	1	–	11	9	–	8	–	3	–	–	8	17
22	–	–	–	–	–	1	–	6	8	–	–	–
23	–	–	–	9	52	51	–	–	–	3	–	–
24	4	–	–	–	30	50	–	–	37	21	–	–
25	–	–	1	–	–	49	–	17	–	2	–	–
26	–	–	–	–	6	11	–	–	–	33	8	–
27	–	–	–	–	19	8	–	85	8	10	–	7
28	28	–	2	–	–	8	6	–	–	40	2	3
29	–	1	–	–	–	–	–	–	7	15	–	–
30	–	–	–	47	3	11	–	28	–	37	–	–
31	–	–	6	–	–	–	9	–	–	–	–	21
Σ	95	272	100	365	187	389	114	442	277	179	240	101

1974

Basin: Bila Station: Tanru Tedong (2)

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	6	27	–	–	–	–	51	13	–	–
2	–	–	–	–	–	–	4	–	–	7	–	–
3	–	–	–	–	–	–	–	4	–	–	–	9
4	–	–	–	43	–	–	–	–	–	–	–	–
5	–	–	–	–	–	2	13	–	27	–	3	–
6	9	–	–	6	31	–	–	–	40	–	4	–
7	–	–	–	–	28	–	4	–	2	–	–	–
8	–	–	–	22	–	15	–	–	–	–	1	–
9	–	–	–	–	–	–	–	–	128	–	3	–
10	–	–	–	53	1	–	4	–	4	–	57	–
11	–	–	–	–	–	–	–	–	1	–	–	–
12	–	–	–	29	–	–	–	–	–	1	–	–
13	–	–	–	16	3	–	3	–	–	–	–	–
14	–	–	–	–	–	5	–	–	55	33	–	–
15	–	23	–	3	21	15	73	–	4	–	7	–
16	1	–	–	7	41	16	–	–	40	12	–	3
17	–	–	–	3	4	32	18	–	–	–	–	–
18	–	–	–	40	6	11	–	–	32	–	8	–
19	–	–	–	–	–	17	2	–	–	84	–	–
20	–	–	–	–	2	11	–	–	–	–	–	–
21	–	–	–	–	–	10	–	–	–	–	–	–
22	–	–	–	–	11	–	31	–	–	10	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	9	17	7	–	–	–	–	–
25	24	2	–	–	42	–	–	–	–	4	–	–
26	3	17	–	–	–	8	2	–	–	30	–	–
27	–	3	54	–	–	–	8	–	7	–	–	29
28	–	–	–	–	–	–	10	–	–	–	–	–
29	–	–	–	–	–	–	17	–	51	–	1	–
30	–	–	–	–	21	–	–	–	–	7	–	–
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	37	65	60	269	220	159	196	4	442	200	85	41

1975

Basin: Bila Station: Tanru Tedong (2)

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	–	–	–
2	–	–	–	6	39	22	–	–	–	–	3	2
3	–	24	–	–	–	29	1	–	5	–	–	–
4	–	2	–	–	–	17	–	–	3	46	–	–
5	–	10	–	–	4	10	15	–	7	30	10	–
6	–	24	–	3	17	4	–	8	31	–	–	–
7	–	–	2	–	68	15	–	18	4	3	–	–
8	–	–	–	10	12	–	–	2	42	48	9	7
9	–	–	3	3	–	61	–	–	–	16	–	5
10	–	–	–	25	–	–	15	–	19	–	–	1
11	–	4	–	9	58	–	4	126	14	–	7	–
12	–	–	–	4	–	47	–	21	–	–	–	–
13	–	–	–	–	–	–	–	–	21	–	–	–
14	–	–	6	2	–	–	36	–	10	–	–	–
15	–	–	–	–	–	–	–	–	14	4	–	6
16	–	–	–	53	–	14	–	–	–	11	–	2
17	–	–	13	55	39	5	2	–	17	1	3	–
18	–	–	–	4	–	18	–	–	–	28	–	4
19	–	–	11	–	48	–	3	–	–	–	–	–
20	–	–	3	–	–	–	21	–	19	1	–	–
21	–	–	–	4	–	–	3	–	–	21	–	–
22	–	–	–	2	–	–	34	–	–	–	–	–
23	–	–	–	–	13	–	–	–	29	–	–	3
24	–	–	–	–	4	–	25	–	–	33	–	–
25	1	–	–	–	–	–	15	1	26	28	–	–
26	–	–	7	–	19	3	–	9	39	–	–	–
27	–	–	–	–	12	–	6	–	50	–	2	–
28	1	2	–	9	–	11	15	20	–	–	–	–
29	–	–	–	10	25	–	–	4	4	4	–	7
30	–	–	–	–	–	3	–	1	18	–	2	–
31	3	–	–	–	2	–	–	20	–	–	–	–
Σ	5	66	45	199	360	259	195	230	372	276	36	37

Table 4-13 RECORD OF DAILY RAINFALL

1968

Basin: Bila Station: Tanru Tedong (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	/	/	/	/	/	/	/	/	/	/	/
30	/	–	/	/	/	/	/	/	/	/	/	/
31	/	–	/	–	/	–	/	/	–	/	–	/
Σ												

1969

Basin: Bila Station: Tanru Tedong (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	/	/	/	/	/	/	/	/	/	/	/
30	/	–	/	/	/	/	/	/	/	/	/	/
31	/	–	/	–	/	–	/	/	–	/	–	/
Σ												

1970

Basin: Bila Station: Tanru Tedong (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	/	/	/	/	/	/	/	/	/	/	/
30	/	–	/	/	/	/	/	/	/	/	/	/
31	/	–	/	–	/	–	/	/	–	/	–	/
Σ												

1971

Basin: Bila Station: Tanru Tedong (2)

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	/	/	/	–	–	1	8	32	–	75	/	–
2	/	/	/	–	–	3	7	6	–	18	/	–
3	/	/	/	–	6	12	–	18	9	–	/	–
4	/	/	/	–	–	–	3	–	–	–	/	–
5	/	/	/	–	–	–	21	–	8	–	/	–
6	/	/	/	–	19	42	42	–	9	–	/	3
7	/	/	/	–	–	2	3	–	5	–	/	2
8	/	/	/	5	–	–	–	–	–	–	/	–
9	/	/	/	9	–	23	–	34	–	–	/	–
10	/	/	/	–	–	–	–	–	–	–	/	–
11	/	/	/	–	8	19	–	4	6	–	/	–
12	/	/	/	–	–	–	–	17	–	–	/	10
13	/	/	/	–	–	–	–	12	14	–	/	–
14	/	/	/	–	–	–	–	67	26	–	/	12
15	/	/	/	1	–	–	–	19	23	7	/	–
16	/	/	/	–	–	4	3	4	24	–	/	–
17	/	/	/	–	18	5	3	–	3	–	/	–
18	/	/	/	–	14	4	4	9	–	–	/	–
19	/	/	/	9	–	20	–	–	33	–	/	–
20	/	/	/	–	5	–	1	41	3	–	/	–
21	/	/	/	31	6	–	–	–	–	–	/	–
22	/	/	/	24	–	23	–	20	4	13	/	–
23	/	/	/	–	–	–	–	9	2	25	/	–
24	/	/	/	–	–	–	–	26	2	63	/	–
25	/	/	/	–	–	12	–	–	4	–	/	–
26	/	/	/	–	–	–	4	2	3	–	/	–
27	/	/	/	–	–	–	63	21	17	–	/	–
28	/	/	/	–	–	–	17	–	38	–	/	–
29	/	/	/	–	12	16	–	8	2	–	/	–
30	/	–	/	–	47	22	–	19	1	24	/	–
31	/	–	/	–	1	–	–	–	–	–	–	–
Σ				79	136	208	179	368	236	225		27

Table 4-14 RECORD OF DAILY RAINFALL

1972

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	–	–	–
2	–	–	–	36	–	–	–	–	–	–	–	–
3	–	–	–	–	7	–	–	–	–	–	–	12
4	–	–	–	–	5	–	–	–	7	–	–	–
5	4	–	–	–	2	–	–	–	–	–	–	–
6	3	–	–	–	4	–	–	–	–	–	–	7
7	32	4	–	–	9	–	–	–	–	–	–	–
8	–	29	–	–	16	–	–	2	–	–	–	–
9	–	11	–	–	2	–	–	–	–	–	–	–
10	–	–	5	–	–	–	1	–	–	–	–	8
11	4	6	–	–	–	–	–	–	–	–	–	–
12	9	–	–	–	–	3	–	–	–	–	–	3
13	–	19	–	–	7	–	4	–	–	–	–	–
14	–	–	–	–	–	–	–	3	–	–	–	25
15	–	–	–	4	–	–	–	–	–	–	–	–
16	–	–	–	–	–	–	1	–	–	–	–	–
17	–	–	–	–	–	–	–	–	–	–	–	–
18	–	–	8	–	9	–	–	67	–	–	–	–
19	–	–	–	–	29	–	–	–	–	–	43	–
20	–	–	–	–	–	–	–	–	–	–	–	–
21	6	–	–	17	8	–	–	–	–	–	–	15
22	–	25	35	–	3	–	–	–	–	–	–	–
23	9	–	–	–	–	8	–	–	–	–	–	–
24	–	8	6	7	–	–	–	–	–	–	–	–
25	–	–	–	15	–	–	–	–	–	–	–	1
26	–	–	11	22	–	–	–	–	–	–	–	–
27	–	–	–	16	–	–	–	–	–	–	–	9
28	–	–	–	–	19	–	–	–	–	–	–	–
29	–	–	–	4	–	–	–	–	–	–	–	–
30	35	–	–	–	–	–	–	–	–	–	–	–
31	–	–	9	–	–	–	–	–	–	–	–	–
Σ	102		74		120		12		7		43	
		102		121		11		72		–		80

1973

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	10	–	–	–	18	4	–	12	–	/	12	–
2	–	–	–	15	7	6	50	29	–	/	15	–
3	19	–	–	–	20	–	38	6	–	/	2	31
4	7	–	–	11	–	10	1	2	–	/	4	–
5	–	–	11	19	–	1	8	–	3	/	–	–
6	21	–	–	35	–	–	71	16	27	/	–	4
7	–	–	3	–	17	24	2	2	11	/	–	10
8	6	37	–	15	61	3	–	32	30	/	27	2
9	10	17	9	4	–	2	14	37	–	/	12	–
10	–	2	–	–	–	–	–	29	–	34	/	–	11
11	11	–	–	–	–	17	–	–	23	/	–	–
12	3	11	2	13	–	–	–	–	3	/	–	–
13	26	–	–	–	–	8	3	–	10	/	10	–
14	16	9	–	3	10	19	19	–	–	/	–	–
15	24	–	–	–	–	–	–	–	7	/	–	8
16	30	–	–	–	–	–	14	6	–	/	–	–
17	–	–	8	–	–	–	2	–	32	/	8	–
18	16	–	–	–	–	4	1	5	8	/	–	–
19	–	12	–	8	27	–	–	–	18	/	–	–
20	–	–	21	–	–	–	–	13	13	/	2	–
21	–	–	–	3	5	21	–	1	3	/	–	5
22	8	–	–	5	1	7	–	3	–	/	–	–
23	–	45	–	20	13	–	–	–	–	/	–	–
24	8	13	–	–	–	–	–	–	97	/	–	–
25	–	–	–	2	–	12	–	14	–	/	–	–
26	–	–	10	–	4	13	–	–	–	/	21	5
27	–	–	1	–	–	5	–	45	16	/	2	–
28	–	–	–	–	23	11	24	1	–	/	–	–
29	–	–	–	–	–	14	–	–	–	/	–	–
30	–	–	–	–	–	17	2	–	–	/	4	–
31	–	–	–	–	–	–	–	5	–	/	–	–
Σ	215		65		206		278		333		119	
		146		153		198		232				76

1974

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	3	15	–	–	117	–	/
2	–	–	3	–	15	–	14	–	–	8	7	/
3	2	1	–	4	2	–	–	18	–	–	–	/
4	–	–	10	103	–	–	–	31	–	3	1	/
5	–	28	–	–	–	–	1	–	–	–	47	/
6	–	2	–	6	–	–	41	–	9	–	3	/
7	–	2	1	–	19	–	–	7	–	–	–	/
8	–	13	–	19	2	–	80	14	–	–	–	/
9	–	29	–	17	16	–	2	6	14	85	–	/
10	–	–	–	–	2	–	–	–	–	–	–	/
11	–	–	–	–	–	–	–	–	21	–	–	/
12	–	–	–	–	–	–	–	–	8	–	–	/
13	–	3	5	10	11	–	–	–	–	–	–	/
14	–	10	–	–	40	–	–	–	12	37	2	/
15	4	–	–	66	23	27	2	–	–	–	–	/
16	–	11	–	47	50	–	–	–	40	11	–	/
17	–	–	–	–	1	12	103	38	–	–	–	/
18	11	–	–	30	–	2	36	–	7	–	–	/
19	–	–	–	4	–	81	–	–	–	–	–	/
20	–	–	–	–	23	4	71	–	–	–	–	/
21	1	–	–	–	–	4	–	–	–	–	–	/
22	8	–	3	–	4	34	1	–	–	–	–	/
23	–	–	3	–	–	–	–	–	–	–	–	/
24	–	–	–	–	–	7	–	–	–	17	–	/
25	–	–	–	–	15	45	–	–	5	–	–	/
26	1	8	20	–	–	–	1	–	–	–	–	/
27	–	1	23	–	55	12	39	–	–	–	–	/
28	–	6	–	–	3	–	–	–	1	–	–	/
29	–	–	12	–	–	–	12	–	–	–	–	/
30	–	–	7	–	–	–	–	7	–	–	–	/
31	–	–	–	–	–	–	–	–	–	–	–	/
Σ	27		87		292		353		117		60	
		114		307		322		83		278		

1975

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	/	/	/	/	/	/	/	/	/	/	/
30	/	–	/	/	/	/	/	/	/	/	/	/
31	/	–	/	–	/	–	/	/	–	/	–	/
Σ												

Table 4-15 RECORD OF DAILY RAINFALL

1968

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	4	12	–	12	–	–	–	–	41
2	108	–	–	35	17	–	–	4	–	–	–	–
3	25	–	–	25	–	23	11	–	–	–	–	–
4	–	–	–	40	–	22	–	83	–	–	–	–
5	–	–	8	18	–	–	38	–	–	–	–	–
6	–	–	–	–	31	–	–	–	–	–	19	–
7	–	2	–	–	–	–	29	50	–	–	44	–
8	–	–	–	11	–	–	–	30	–	–	–	37
9	–	–	13	10	–	43	54	5	12	–	–	–
10	–	–	–	–	–	–	–	–	–	–	–	17
11	–	–	31	80	–	–	–	45	–	–	–	25
12	–	–	53	–	15	7	21	45	76	–	6	5
13	5	–	–	–	10	–	–	15	7	–	–	10
14	22	–	–	–	11	–	–	–	–	–	–	–
15	–	–	–	–	17	94	–	–	–	–	–	–
16	4	12	–	60	4	4	–	–	–	–	–	31
17	15	–	57	–	–	–	14	–	–	–	–	–
18	–	5	80	–	–	32	14	–	25	–	–	–
19	–	–	11	5	16	92	7	–	–	–	–	64
20	–	–	29	–	–	32	–	–	–	17	–	–
21	–	–	13	20	11	14	75	–	–	–	–	–
22	–	–	13	10	–	–	–	–	–	–	–	–
23	–	–	59	–	–	–	5	–	–	–	–	–
24	–	–	22	11	–	–	17	–	–	–	–	–
25	7	–	–	–	–	7	137	14	–	–	–	–
26	–	2	–	58	20	–	13	42	–	–	–	–
27	–	–	–	–	3	6	–	–	–	5	–	–
28	–	–	–	28	–	14	–	–	–	–	–	–
29	–	–	–	–	6	–	–	11	–	9	–	–
30	–	–	–	–	–	14	30	–	5	10	–	–
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	186	21	389	415	173	404	477	344	125	41	69	230

1969

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	22	48	–	–	–	–	–	–
2	7	–	–	–	23	–	14	–	–	–	–	–
3	–	–	–	17	–	–	62	–	7	–	–	–
4	17	–	–	–	–	16	15	–	–	–	–	13
5	–	8	–	–	–	–	–	–	–	–	–	–
6	–	–	–	20	43	43	7	–	–	–	14	–
7	–	–	–	28	25	–	–	6	–	–	–	–
8	–	–	80	–	–	7	–	16	–	–	–	–
9	–	–	10	46	15	–	–	–	–	–	2	–
10	–	25	5	–	–	8	–	9	–	–	–	–
11	–	–	–	–	42	–	18	–	–	1	–	–
12	33	–	–	25	51	5	–	14	–	–	–	–
13	–	18	–	–	67	–	10	–	–	–	4	36
14	–	16	58	–	16	–	–	–	–	–	–	–
15	7	–	–	–	–	18	–	–	–	–	–	–
16	–	21	–	–	–	–	12	–	–	–	–	–
17	–	–	–	34	–	–	5	63	–	–	–	14
18	–	–	–	–	–	–	–	–	–	–	–	–
19	14	–	21	–	–	–	–	–	–	–	–	7
20	–	–	–	74	–	–	–	–	–	–	–	–
21	–	–	–	–	6	–	–	–	–	–	10	–
22	–	–	–	8	63	–	–	–	–	–	–	43
23	–	40	34	7	68	–	–	–	–	–	–	23
24	–	–	14	19	49	–	–	7	–	–	–	–
25	13	16	15	8	–	–	–	–	–	–	–	–
26	–	–	50	–	33	–	–	–	–	–	–	10
27	–	–	–	82	4	–	–	14	11	3	–	–
28	–	–	–	16	–	–	5	–	9	–	–	–
29	–	–	–	18	–	64	15	8	–	–	–	–
30	–	–	115	–	–	6	–	–	7	–	–	–
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	91	144	402	402	527	215	163	137	34	4	30	146

1970

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	5	–	–	11	17	–	47	–	–	–	–
2	11	14	–	31	–	21	–	–	–	–	–	–
3	–	18	–	–	50	9	22	–	–	–	12	–
4	13	–	–	–	11	18	–	18	–	–	–	–
5	28	34	65	–	42	45	32	–	–	–	–	–
6	8	–	3	22	–	–	–	–	–	–	–	–
7	–	9	–	13	–	49	6	–	–	–	–	–
8	26	–	–	66	–	44	15	–	–	–	–	–
9	–	–	36	5	–	–	31	3	–	–	–	–
10	–	–	3	16	10	25	8	–	–	–	–	–
11	–	–	–	–	18	38	–	–	–	–	–	–
12	–	–	–	8	42	–	13	–	–	–	–	–
13	–	–	–	–	14	–	–	–	44	–	6	–
14	–	–	–	5	64	–	10	–	15	–	–	–
15	–	–	31	5	98	–	–	–	–	–	–	–
16	–	–	–	12	–	–	69	–	–	–	–	–
17	–	–	32	–	–	–	–	–	24	11	–	–
18	–	–	–	–	75	–	–	–	17	–	–	–
19	–	–	–	–	4	–	–	13	–	–	–	3
20	5	–	–	–	69	–	36	4	–	–	22	14
21	–	–	–	–	11	15	18	–	–	46	–	16
22	–	8	–	–	–	43	63	–	–	9	–	–
23	–	–	–	–	–	–	15	–	11	–	–	–
24	–	–	33	12	19	19	–	–	–	–	–	–
25	–	–	4	–	94	–	–	–	–	–	–	–
26	–	–	–	34	11	36	–	–	–	–	33	–
27	–	–	13	–	9	–	–	–	–	–	–	–
28	–	–	7	12	–	–	–	–	–	–	–	–
29	–	–	–	44	5	–	–	–	–	17	–	–
30	–	–	–	10	–	–	3	–	–	–	–	–
31	–	–	–	–	33	–	–	–	–	–	–	–
Σ	91	88	227	295	690	379	341	85	111	83	73	33

1971

Basin: Cenranae Station: Watanpone

M / D	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	7	–	–	21	–	33	–	/	/
2	–	–	–	25	–	3	–	39	40	–	/	/
3	6	–	–	–	–	–	–	–	–	–	/	/
4	13	–	–	48	9	23	–	–	–	–	/	/
5	5	–	–	20	30	–	36	–	13	–	/	/
6	–	–	–	15	–	13	–	–	35	–	/	/
7	–	–	–	–	3	–	–	–	–	–	/	/
8	–	–	–	–	–	–	–	22	–	–	/	/
9	–	–	–	6	–	5	–	–	–	–	/	/
10	11	–	–	–	–	–	–	18	–	–	/	/
11	–	–	–	7	57	–	–	–	–	–	/	/
12	14	–	–	10	–	–	–	45	19	34	/	/
13	–	–	–	5	–	80	–	3	18	–	/	/
14	–	–	–	–	–	6	–	–	–	–	/	/
15	–	–	–	–	–	–	–	–	–	–	/	/
16	–	32	–	–	3	125	–	–	–	–	/	/
17	22	–	–	–	7	53	–	8	19	–	/	/
18	–	–	–	–	–	–	–	9	–	–	/	/
19	–	19	–	–	–	–	–	–	–	–	/	/
20	–	–	–	–	53	–	–	–	–	–	/	/
21	–	15	–	12	–	22	–	–	–	–	/	/
22	–	3	–	–	–	–	–	–	–	25	/	/
23	–	–	–	–	–	–	–	–	–	–	/	/
24	14	–	–	–	–	15	46	–	–	24	/	/
25	–	2	51	–	–	29	–	–	–	–	/	/
26	–	29	–	–	–	–	–	–	9	–	/	/
27	–	–	–	–	–	25	59	10	–	–	/	/
28	–	–	–	–	13	18	2	–	13	–	/	/
29	–	–	–	–	–	13	–	64	14	–	/	/
30	–	–	–	–	33	25	–	–	50	56	/	/
31	–	–	–	–	–	–	–	5	–	–	–	/
Σ	85	100	51	155	208	455	164	205	281	139		

Table 4-16 RECORD OF DAILY RAINFALL

1964

Basin: Centranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	–	–	–	–	–	–	–	–	12	–	–
2	19	–	35	–	47	–	–	–	–	20	–	–
3	7	–	16	43	–	–	54	90	–	–	–	–
4	–	–	–	40	60	–	7	35	21	–	–	–
5	–	–	–	–	–	9	–	–	14	30	–	–
6	–	65	–	–	–	–	10	–	–	–	10	–
7	–	–	–	–	–	35	63	–	–	33	–	10
8	–	–	–	–	45	7	–	–	28	13	–	25
9	R	–	–	40	36	18	–	–	15	–	26	–
10	–	–	–	23	–	–	21	10	–	10	–	52
11	–	–	–	–	10	7	–	–	–	–	15	–
12	–	35	22	–	–	–	–	–	10	–	49	–
13	–	–	40	23	–	–	24	–	–	30	10	–
14	17	–	–	10	–	–	–	–	45	36	–	10
15	–	–	–	10	–	–	37	–	16	–	–	–
16	–	–	40	72	–	25	14	–	10	10	–	–
17	–	76	13	41	–	16	–	–	–	–	–	–
18	37	3	28	4	14	–	–	–	–	–	31	–
19	–	–	–	–	–	–	–	–	–	–	–	–
20	15	–	–	–	–	10	–	30	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	13	–
22	–	–	–	6	–	30	–	5	–	5	–	20
23	–	–	–	–	–	–	–	–	–	–	–	4
24	–	–	–	–	–	–	26	–	–	5	–	4
25	30	–	–	–	5	–	–	–	–	–	–	–
26	–	61	–	–	16	–	–	–	–	39	6	–
27	–	10	–	42	21	–	–	35	–	–	–	8
28	–	–	–	–	–	–	–	–	–	–	–	–
29	–	–	–	3	–	–	30	5	15	–	–	–
30	–	25	–	54	–	–	–	–	–	–	–	–
31	–	–	–	–	–	–	–	–	–	–	–	–
Σ	133	255	194	411	254	157	286	210	174	243	160	133

1965

Basin: Centranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	76	–	–	25	–	–	–	–	–	–	–
2	–	10	–	–	29	20	–	–	–	–	–	–
3	–	–	–	–	30	4	–	–	–	–	–	–
4	30	–	–	–	21	–	–	–	–	–	–	5
5	19	–	–	6	17	–	–	–	–	–	–	4
6	–	–	–	–	33	35	–	–	–	–	–	18
7	–	–	4	25	13	55	–	–	–	–	–	–
8	–	–	–	–	–	–	–	–	–	–	–	–
9	–	6	–	5	14	41	–	–	–	–	–	–
10	–	–	–	–	19	10	–	–	–	–	–	–
11	–	–	7	–	–	–	–	–	–	–	–	–
12	–	–	–	80	12	–	–	–	–	–	–	–
13	–	–	–	30	18	54	46	–	–	–	–	78
14	–	–	44	4	–	6	–	–	–	7	3	
15	–	–	–	–	47	–	–	–	–	–	–	2
16	–	19	–	–	–	–	–	–	–	–	–	–
17	–	16	5	–	–	–	–	–	–	–	–	3
18	–	–	–	18	22	–	–	–	R	–	–	–
19	–	–	14	14	–	–	–	–	–	–	–	12
20	–	–	–	–	–	–	–	–	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	–	–	–
25	–	12	29	92	7	–	–	–	–	–	–	23
26	10	–	–	5	–	–	–	–	–	–	–	–
27	–	–	–	11	–	–	–	–	–	–	–	–
28	–	–	–	–	6	82	–	–	–	31	–	–
29	–	–	–	–	–	–	–	–	–	–	–	–
30	–	–	–	27	–	–	–	–	2	17	–	
31	–	–	–	–	–	–	–	–	–	–	–	4
Σ	59	139	94	317	313	347	46	–	8	2	55	152

1966

Basin: Centranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	–	35	–	–	–	11	–	2	–	–	–	–
2	–	11	17	–	–	36	–	–	–	46	–	–
3	–	10	21	–	–	3	–	–	–	–	–	–
4	–	4	1	–	–	–	–	–	–	12	–	22
5	4	16	–	24	–	2	4	–	–	11	–	40
6	–	–	–	10	–	58	–	–	–	–	–	–
7	–	33	–	–	–	–	–	–	–	–	–	–
8	–	4	4	1	–	–	3	4	–	–	–	–
9	–	–	5	–	10	–	14	6	–	–	–	5
10	–	13	1	–	22	–	10	14	–	–	–	19
11	–	–	5	–	16	–	–	–	–	–	–	50
12	5	–	6	14	7	–	10	–	–	22	–	15
13	–	–	–	85	11	–	53	–	–	–	–	–
14	2	–	9	11	–	7	–	6	–	–	–	–
15	–	5	12	–	–	–	–	–	4	–	–	–
16	10	32	14	–	–	19	–	–	–	–	4	25
17	–	4	–	75	–	17	–	–	–	–	–	–
18	–	35	–	17	–	9	–	–	–	–	–	21
19	–	–	–	28	–	–	–	79	–	–	–	–
20	–	–	–	–	–	–	–	–	–	–	–	–
21	–	–	31	–	–	–	–	–	–	–	–	R
22	–	–	5	22	92	–	–	–	–	–	–	12
23	12	–	12	–	–	–	–	2	–	–	45	23
24	–	19	12	–	160	–	10	–	–	–	–	–
25	–	10	–	10	8	–	–	–	–	–	–	17
26	–	–	–	–	3	–	6	–	–	–	–	–
27	–	–	16	2	–	–	–	–	–	–	–	–
28	5	–	–	–	–	–	2	–	–	–	–	–
29	–	–	–	–	11	5	10	–	–	–	18	–
30	40	–	–	–	18	14	–	–	35	–	11	–
31	52	–	–	–	11	–	–	–	–	–	–	25
Σ	130	222	171	299	369	181	122	113	39	91	78	282

1967

Basin: Centranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	2	–	–	/	/	/	/	/	/	/	/	/
2	–	–	–	/	/	/	/	/	/	/	/	/
3	–	–	–	/	/	/	/	/	/	/	/	/
4	–	–	–	/	/	/	/	/	/	/	/	/
5	–	–	–	/	/	/	/	/	/	/	/	/
6	–	–	–	/	/	/	/	/	/	/	/	/
7	–	–	–	/	/	/	/	/	/	/	/	/
8	–	–	11	/	/	/	/	/	/	/	/	/
9	–	–	5	/	/	/	/	/	/	/	/	/
10	–	4	–	/	/	/	/	/	/	/	/	/
11	–	17	–	/	/	/	/	/	/	/	/	/
12	–	31	–	/	/	/	/	/	/	/	/	/
13	7	15	–	/	/	/	/	/	/	/	/	/
14	–	11	–	/	/	/	/	/	/	/	/	/
15	15	–	–	/	/	/	/	/	/	/	/	/
16	–	–	–	/	/	/	/	/	/	/	/	/
17	–	–	–	/	/	/	/	/	/	/	/	/
18	–	–	20	/	/	/	/	/	/	/	/	/
19	–	–	33	/	/	/	/	/	/	/	/	/
20	–	–	–	/	/	/	/	/	/	/	/	/
21	–	5	–	/	/	/	/	/	/	/	/	/
22	–	–	–	/	/	/	/	/	/	/	/	/
23	3	–	–	/	/	/	/	/	/	/	/	/
24	–	4	3	/	/	/	/	/	/	/	/	/
25	–	–	5	/	/	/	/	/	/	/	/	/
26	–	19	41	/	/	/	/	/	/	/	/	/
27	–	–	–	/	/	/	/	/	/	/	/	/
28	–	–	–	/	/	/	/	/	/	/	/	/
29	13	–	18	/	/	/	/	/	/	/	/	/
30	–	–	48	/	/	/	/	/	/	/	/	/
31	–	–	2	–	/	–	/	/	–	/	–	/
Σ	40	106	186									

Table 4-17 RECORD OF DAILY RAINFALL

1960

Basin: Cenranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	/	/	/	/	/	/	/	/	/	/	/
30	/	-	/	/	/	/	/	/	/	/	/	/
31	/	-	/	-	/	-	/	/	-	/	-	/
Σ												

1961

Basin: Cenranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	-	/	/	/	/	/	/	/	/	/	/
30	/	-	/	/	/	/	/	/	/	/	/	/
31	/	-	/	-	/	-	/	/	-	/	-	/
Σ												

1962

Basin: Cenranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	/	/	/	/	/	/	/	/	/	/	/	/
2	/	/	/	/	/	/	/	/	/	/	/	/
3	/	/	/	/	/	/	/	/	/	/	/	/
4	/	/	/	/	/	/	/	/	/	/	/	/
5	/	/	/	/	/	/	/	/	/	/	/	/
6	/	/	/	/	/	/	/	/	/	/	/	/
7	/	/	/	/	/	/	/	/	/	/	/	/
8	/	/	/	/	/	/	/	/	/	/	/	/
9	/	/	/	/	/	/	/	/	/	/	/	/
10	/	/	/	/	/	/	/	/	/	/	/	/
11	/	/	/	/	/	/	/	/	/	/	/	/
12	/	/	/	/	/	/	/	/	/	/	/	/
13	/	/	/	/	/	/	/	/	/	/	/	/
14	/	/	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/	/	/
16	/	/	/	/	/	/	/	/	/	/	/	/
17	/	/	/	/	/	/	/	/	/	/	/	/
18	/	/	/	/	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/	/	/	/	/
21	/	/	/	/	/	/	/	/	/	/	/	/
22	/	/	/	/	/	/	/	/	/	/	/	/
23	/	/	/	/	/	/	/	/	/	/	/	/
24	/	/	/	/	/	/	/	/	/	/	/	/
25	/	/	/	/	/	/	/	/	/	/	/	/
26	/	/	/	/	/	/	/	/	/	/	/	/
27	/	/	/	/	/	/	/	/	/	/	/	/
28	/	/	/	/	/	/	/	/	/	/	/	/
29	/	-	/	/	/	/	/	/	/	/	/	/
30	/	-	/	/	/	/	/	/	/	/	/	/
31	/	-	/	-	/	-	/	/	-	/	-	/
Σ												

1963

Basin: Cenranae Station: Watanpone

D \ M	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	-	-	20	-	-	-	16	17	-	-	-	-
2	32	4	23	-	-	-	-	63	-	-	-	-
3	-	-	-	4	7	-	-	21	-	-	-	-
4	-	-	10	-	-	-	-	-	-	-	-	-
5	-	-	-	6	-	-	-	6	-	-	-	-
6	-	-	-	48	53	30	-	-	-	-	-	-
7	-	-	35	-	140	-	-	-	-	-	-	10
8	-	-	4	15	-	-	-	-	-	-	-	25
9	-	-	-	56	87	-	-	-	29	-	-	-
10	-	-	-	58	-	-	10	-	-	-	4	52
11	10	-	42	-	-	45	-	-	-	-	-	-
12	-	-	78	-	-	-	-	-	-	-	-	-
13	-	-	-	9	-	-	-	-	-	-	-	-
14	4	-	-	-	-	-	-	-	-	-	-	10
15	-	-	-	60	-	-	9	-	-	-	-	-
16	14	-	-	21	4	-	-	-	-	-	-	-
17	4	-	40	-	-	39	-	-	-	-	-	-
18	-	23	22	-	41	128	-	-	-	-	-	-
19	-	54	40	-	-	20	-	15	-	-	16	-
20	-	-	13	-	48	13	-	-	24	-	-	-
21	-	32	15	-	7	50	-	-	-	-	-	-
22	-	27	6	-	-	30	-	-	-	-	-	20
23	-	30	-	-	13	-	-	-	-	-	-	4
24	8	-	-	-	26	16	-	-	-	-	16	4
25	-	-	-	4	-	-	16	-	-	-	-	-
26	-	-	-	-	-	-	4	-	-	-	-	-
27	-	70	-	-	13	20	-	-	-	-	-	8
28	-	41	-	-	-	-	-	-	-	-	-	-
29	10	-	-	27	-	19	9	-	-	-	15	-
30	17	-	-	3	-	-	6	-	-	-	40	-
31	-	-	-	-	-	-	-	-	-	-	-	-
Σ	99		348		439		70		53		91	
		279		311		410		122		-		133

Table 6

DAILY WATER STAGE DATA - EXISTING CONDITION

year / month / station	1968												1969											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Buru Cenrana (1)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Buru Cenrana (2)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Bila	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Tanru Tedong	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Kampiri	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Solo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Cenranae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Tg. Pallette	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Sing Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Sanrego	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Batupute	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Ujung Lamuru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Lang Kemme	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Sera	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Pantjong Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Lakibong	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Cabbenge	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Canru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Wage	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Lawo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Padangeng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Batubatu	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
L. Tempe	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Laringgi	/	Δ	Δ	Δ	O	O	O	O	Δ	O	O	O	Δ	O	Δ	O	O	O	O	O	O	Δ	O	/
L. Sidenreng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Gilirang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Tarumpakae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

year / month / station	1970												1971												1972												Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Buru Cenrana (1)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Buru Cenrana (2)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Bila	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Tanru Tedong	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Kampiri	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Solo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Cenranae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Tg. Pallette	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Sing Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Sanrego	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Batupute	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Ujung Lamuru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Lang Kemme	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Sera	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Pantjong Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Lakibong	/	/	/	/	/	/	/	O	O	O	O	O	O	O	O	/	O	O	O	/	O	O	O	O	O	O	/	O	O	O	O	O	O	O	O	O	
Cabbenge	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Ⓐ
Canru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Wage	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Lawo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Padangeng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Batubatu	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
L. Tempe	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Laringgi	O	O	Δ	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	Δ	/	/	/	/	/	/	/	
L. Sidenreng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Gilirang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
Tarumpakae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	

year / month / station	1973												1974											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Buru Cenrana (1)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Buru Cenrana (2)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Bila	/	/	/	Δ	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	Δ	O
Tanru Tedong	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Δ	Δ	O	O	O	O	Δ	O	Δ	O
Kampiri	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Solo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Cenranae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Tg. Pallette	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Sing Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Δ	O
Sanrego	/	/	/	Δ	Δ	/	/	/	Δ	O	O	O	O	O	/	Δ	O	Δ	Δ	O	O	O	O	O
Batupute	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Ujung Lamuru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	Δ	O	O
Lang Kemme	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O
Sera	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Pantjong Kang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Lakibong	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Cabbenge	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Δ	O
Canru	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Wage	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Lawo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Padangeng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Batubatu	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
L. Tempe	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Laringgi	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
L. Sidenreng	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Gilirang	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Tarumpakae	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

year / month / station	1975												1976												Remarks
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Buru Cenrana (1)	/	/	/	/	/	/	/	/	/	/	/	/	O	Δ	O	O	O	*	*						
Buru Cenrana (2)	/	/	/	/	/	/	/	/	/	O	O	O	O	O	O	O	Δ	*	*						
Bila	O	Δ	O	O	Δ	Δ	O	/	/	/	O	O	O	Δ	*	*	*	*	*						Ⓐ
Tanru Tedong	Δ	Δ	O	O	Δ	Δ	Δ	/	/	/	O	O	*	*	*	*	*	*	*						Ⓐ
Kampiri	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	O	O	*						
Solo	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/						Ⓐ
Cenranae	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	O	O	*						
Tg. Pallette	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	Δ	Δ	O	O	O						
Sing Kang	O	O	O	O	O	O	O	O	O	O	Δ	*	*	*	*	*	*	*	*						Ⓐ
Sanrego	O	/	O	O	O	O	O	Δ	O	O	O	O	O	/	Δ	O	*	*	*						Ⓐ
Batupute	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	Δ	O	*	*	*						
Ujung Lamuru	Δ	/	Δ	O	O	O	Δ	O	O	O	O	/	/	/	Δ	O	Δ	*	*						Ⓐ
Lang Kemme	O	O	O	Δ	/	Δ	O	O	O	O	O	O	O	Δ	*	*	*	*	*						Ⓐ
Sera	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	*	*	*						
Pantjong Kang	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	*	*	*						
Lakibong	/	/	/	/	/	/	/	/	Δ	Δ	/	/	/	Δ	O	O	*	*	*						
Cabbenge	O	O	O	O	O	O	O	O	O	O	Δ	*	*	*	*	*	*	*	*						Ⓐ
Canru	/	/	/	/	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*						
Wage	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	O	O	*						
Lawo	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	*	*	*	*						
Padangeng	/	/	/	/	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*						
Batubatu	/	/	/	/	/	O	O	O	O	O	O	O	O	Δ	O	*	*	*	*						
L. Tempe	/	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	*						
Laringgi	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/						
L. Sidenreng	/	/	/	/	/	/	/	/	/	O	O	O	O	O	O	O	*	*	*						
Gilirang	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	*						
Tarumpakae	/	/	/	/	/	/	/	/	Δ	O	O	O	O	O	O	O	O	O	*						

Ⓐ Automatical Observation Station

Fig. 2-1 DAILY WATER STAGE RECORD AT BURU CENRANA(I)

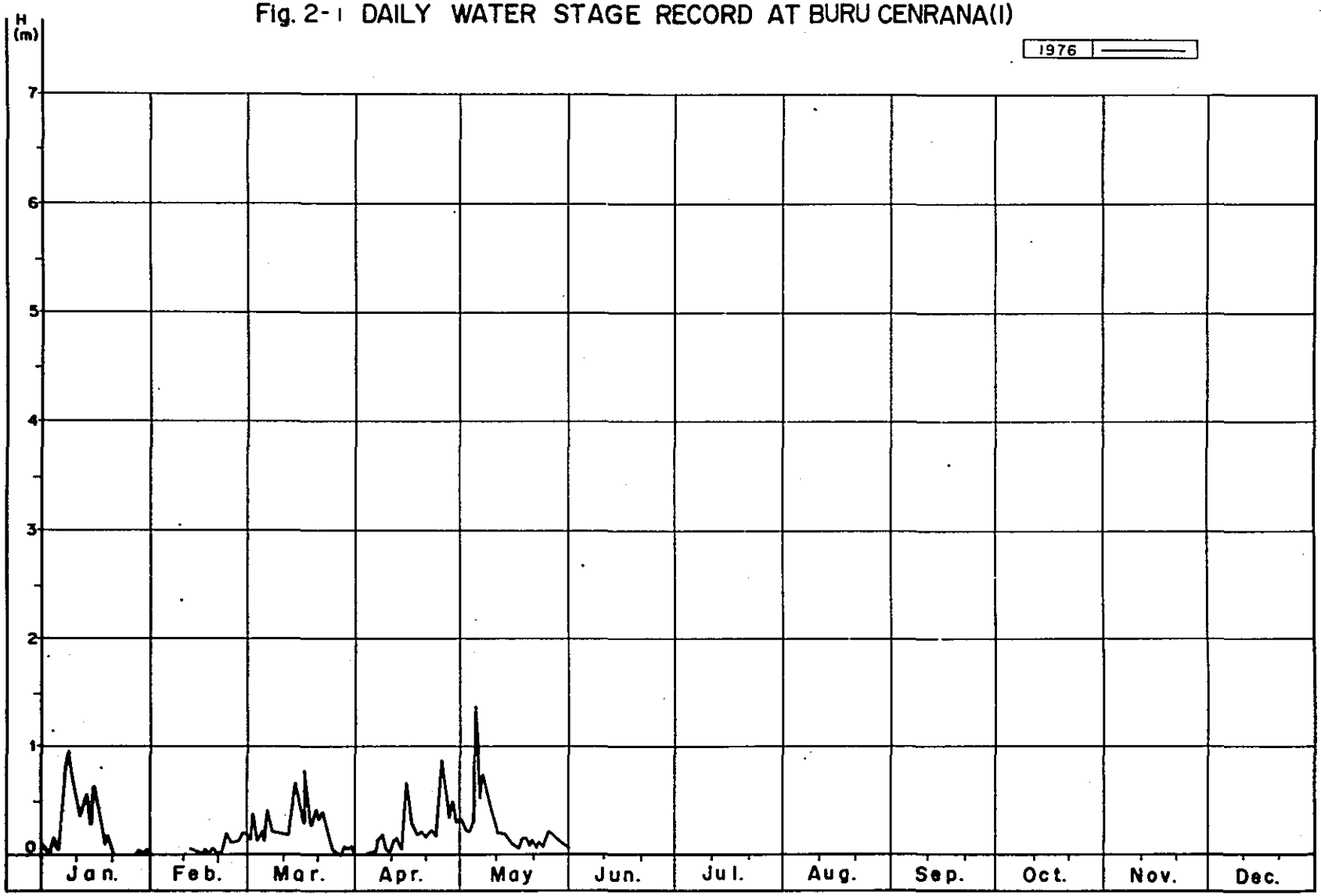


Fig. 2-2 DAILY WATER STAGE RECORD AT BURU CENRANA (2)

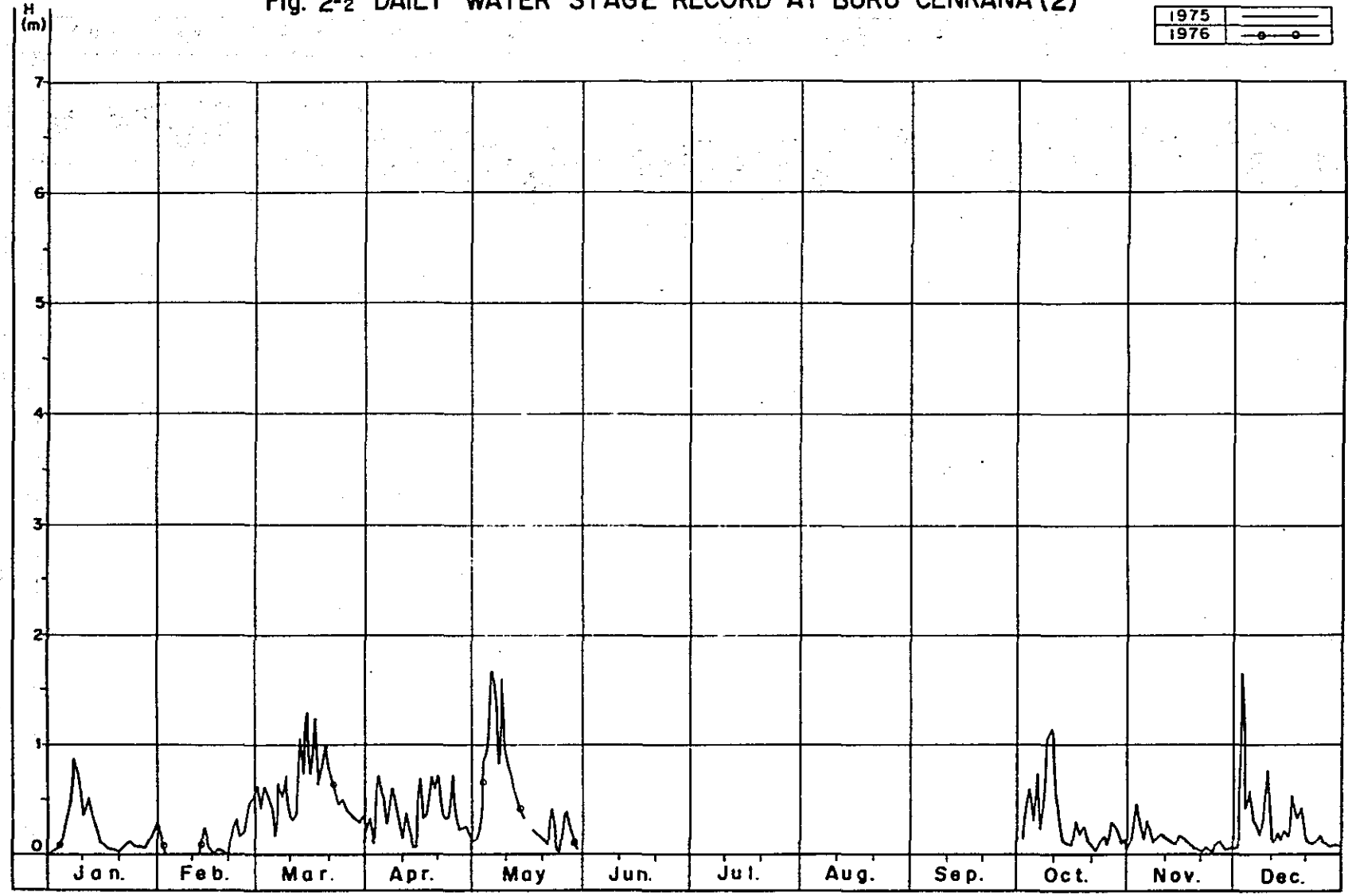


Fig.2-3 DAILY WATER STAGE RECORD AT BILA

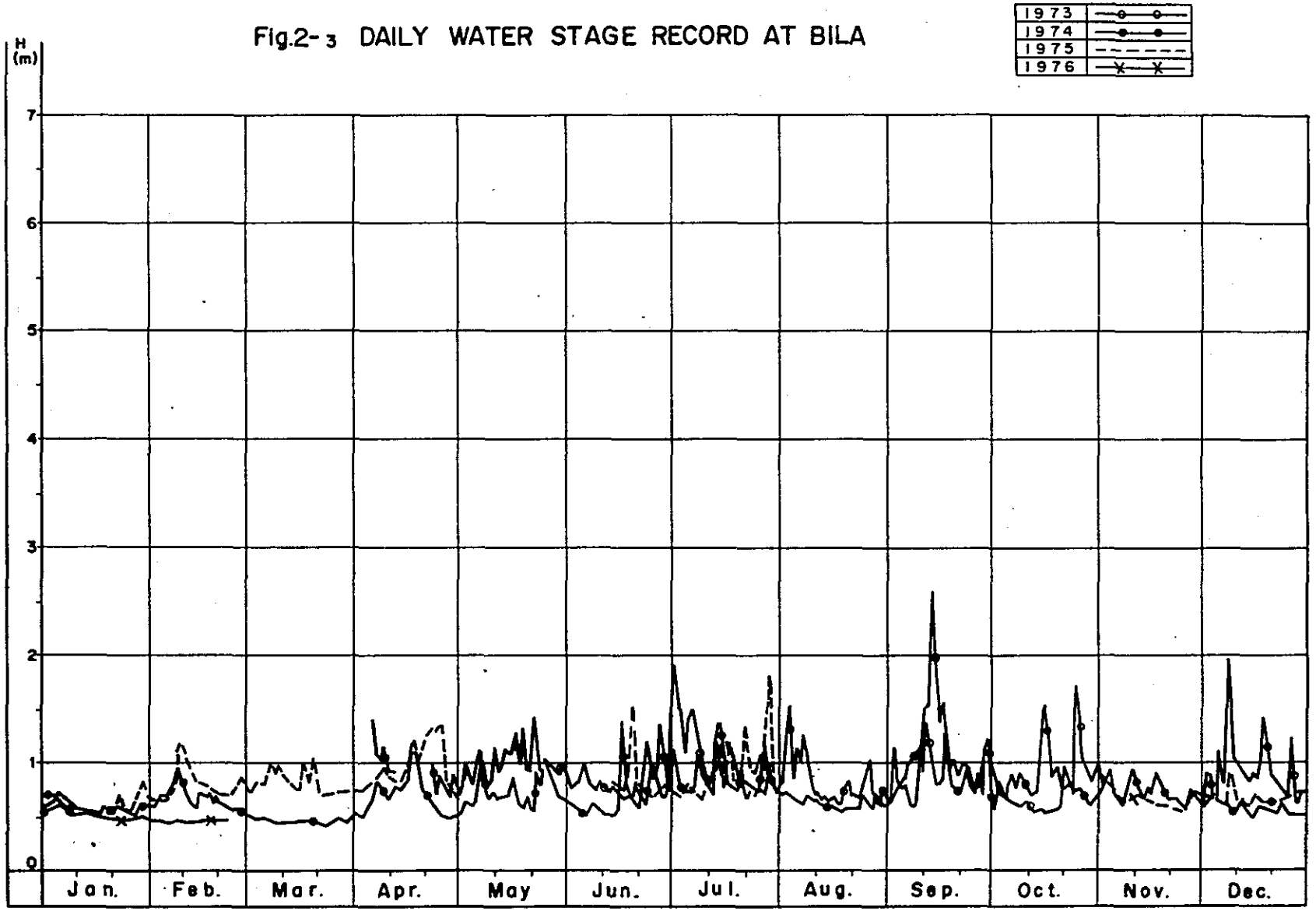


Fig. 2-4 DAILY WATER STAGE RECORD AT TANRU TEDONG

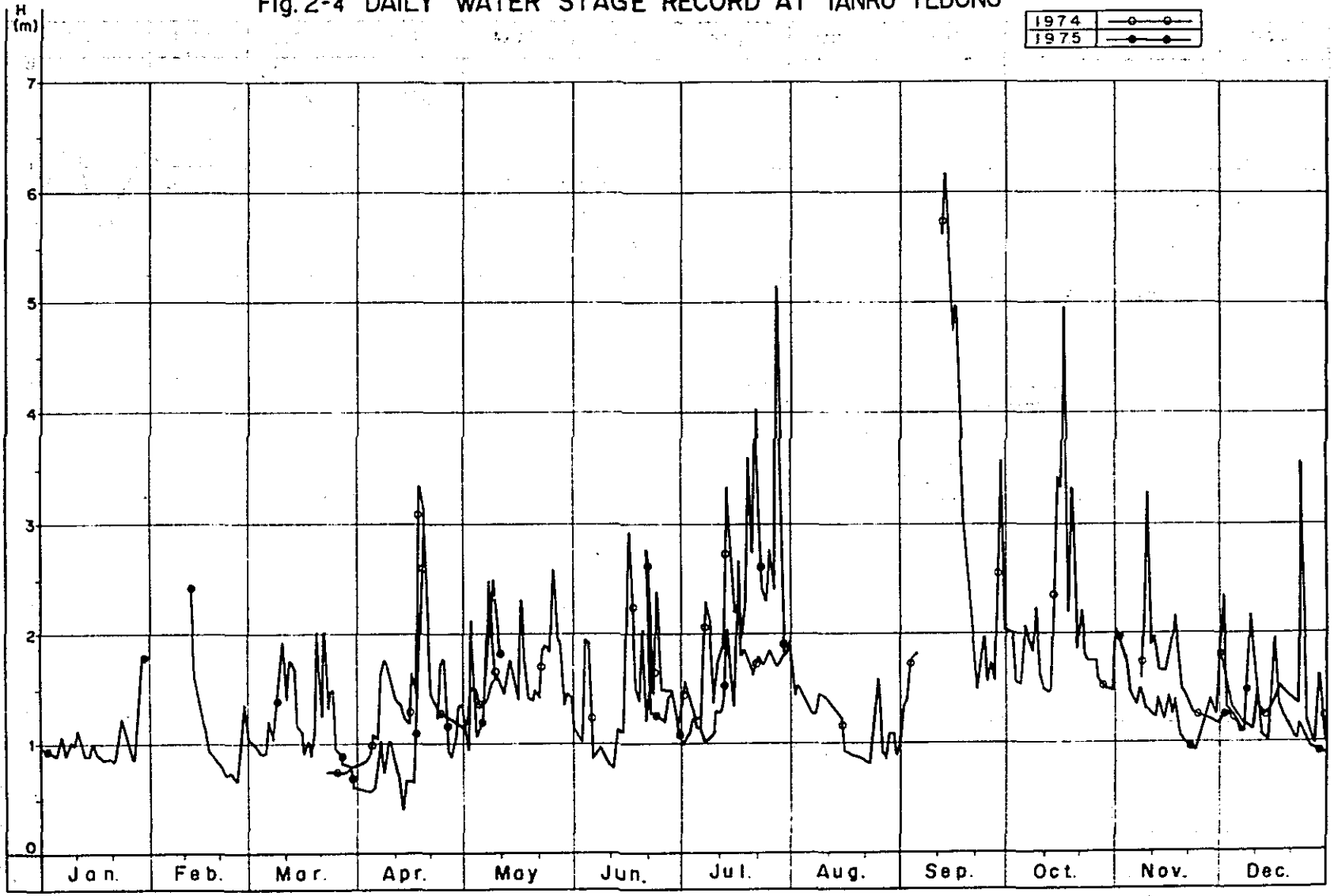


Fig. 2-5 DAILY WATER STAGE RECORD AT KAMPIRI

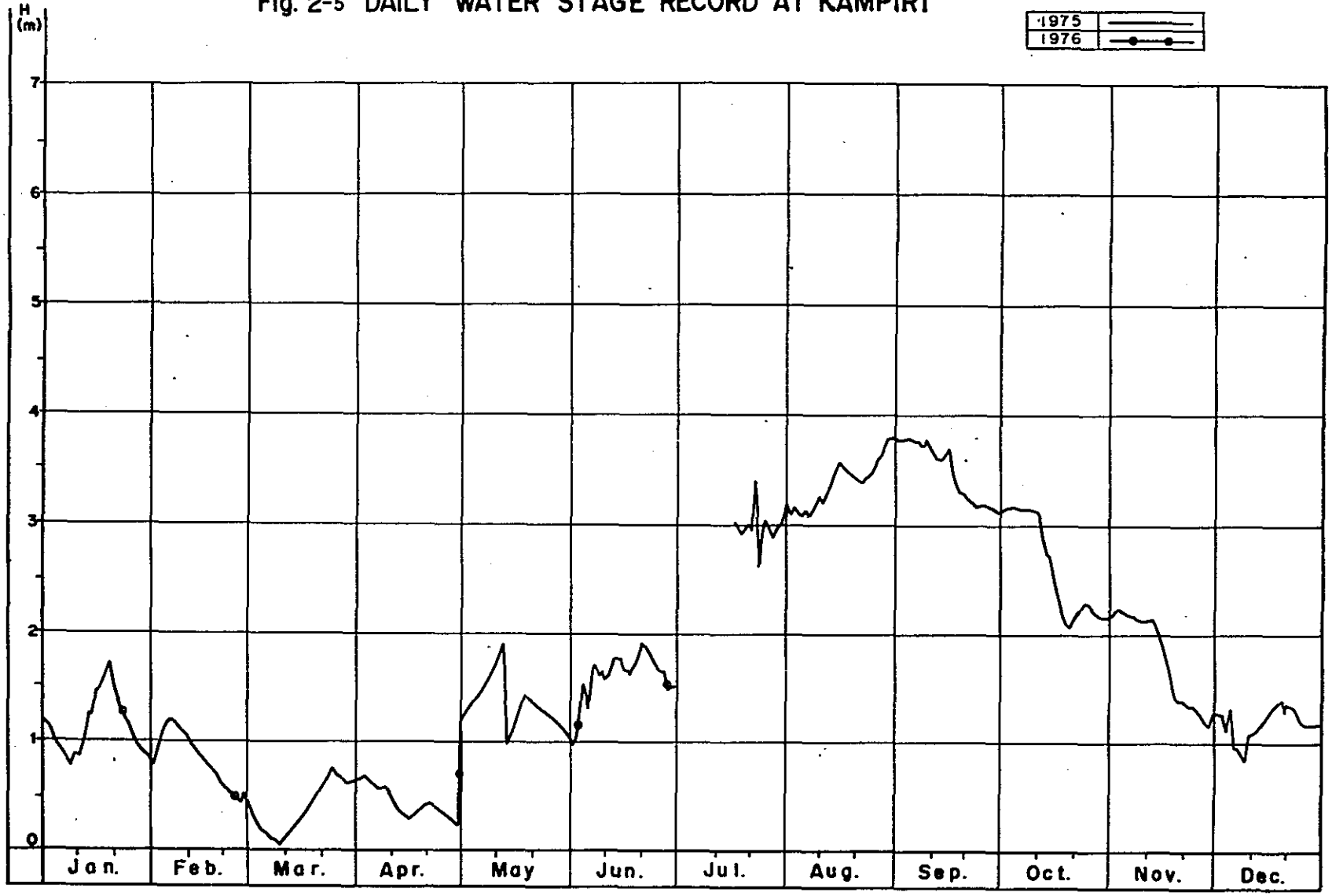


Fig.2-6 DAILY WATER STAGE RECORD AT CENRANAE

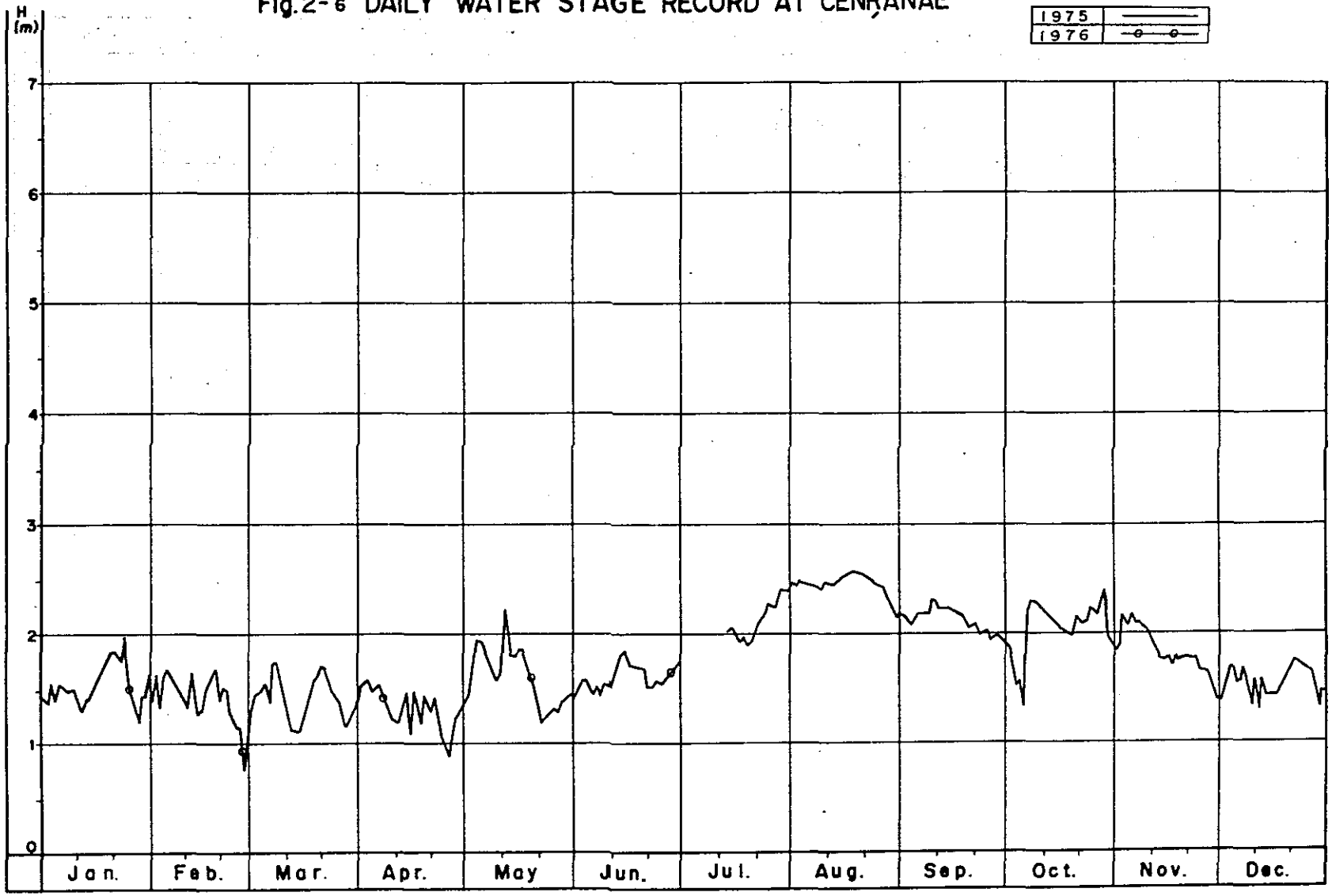


Fig. 2-7 DAILY WATER STAGE RECORD AT TG. PALLETTE

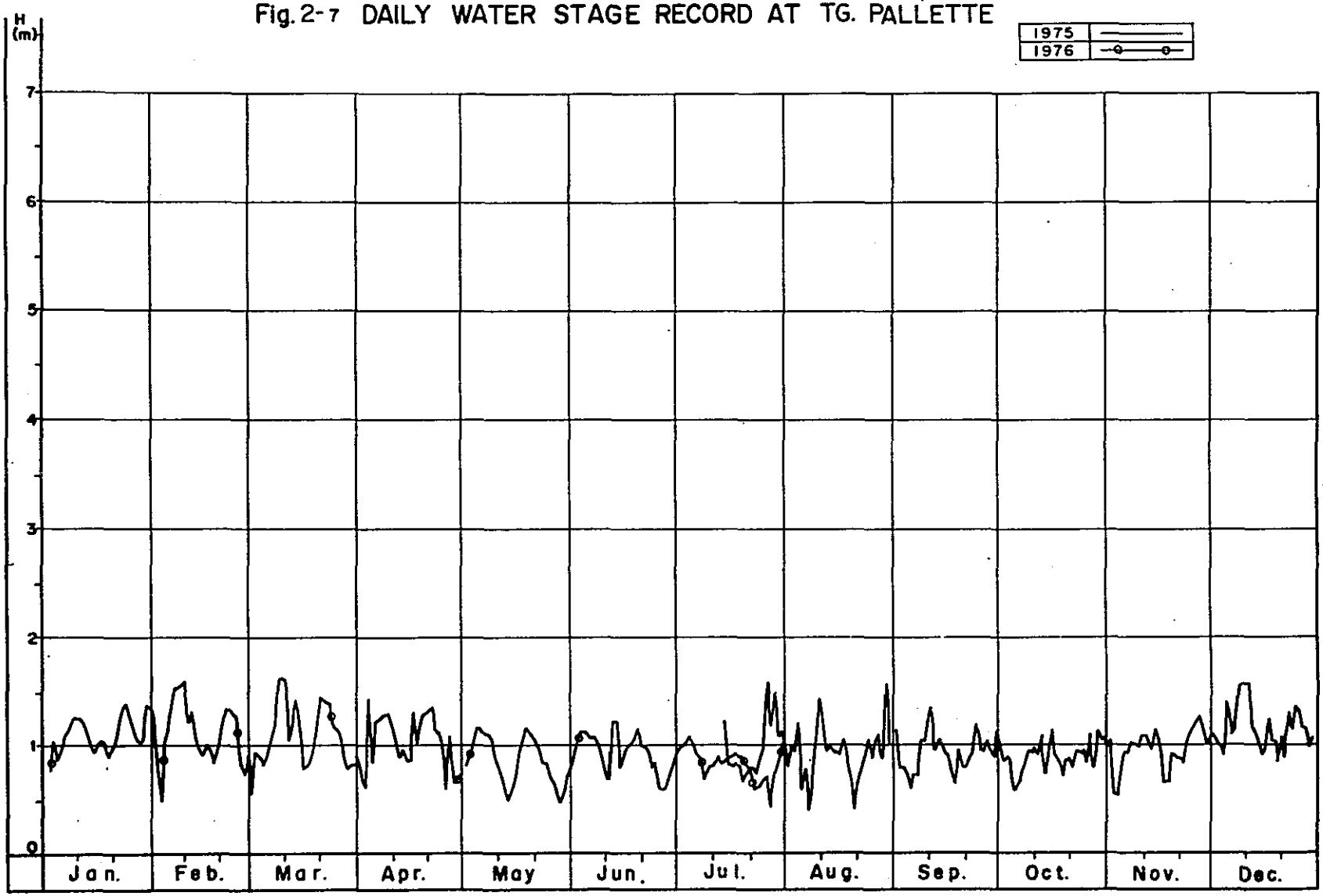


Fig. 2-8 DAILY WATER STAGE RECORD AT SING KANG

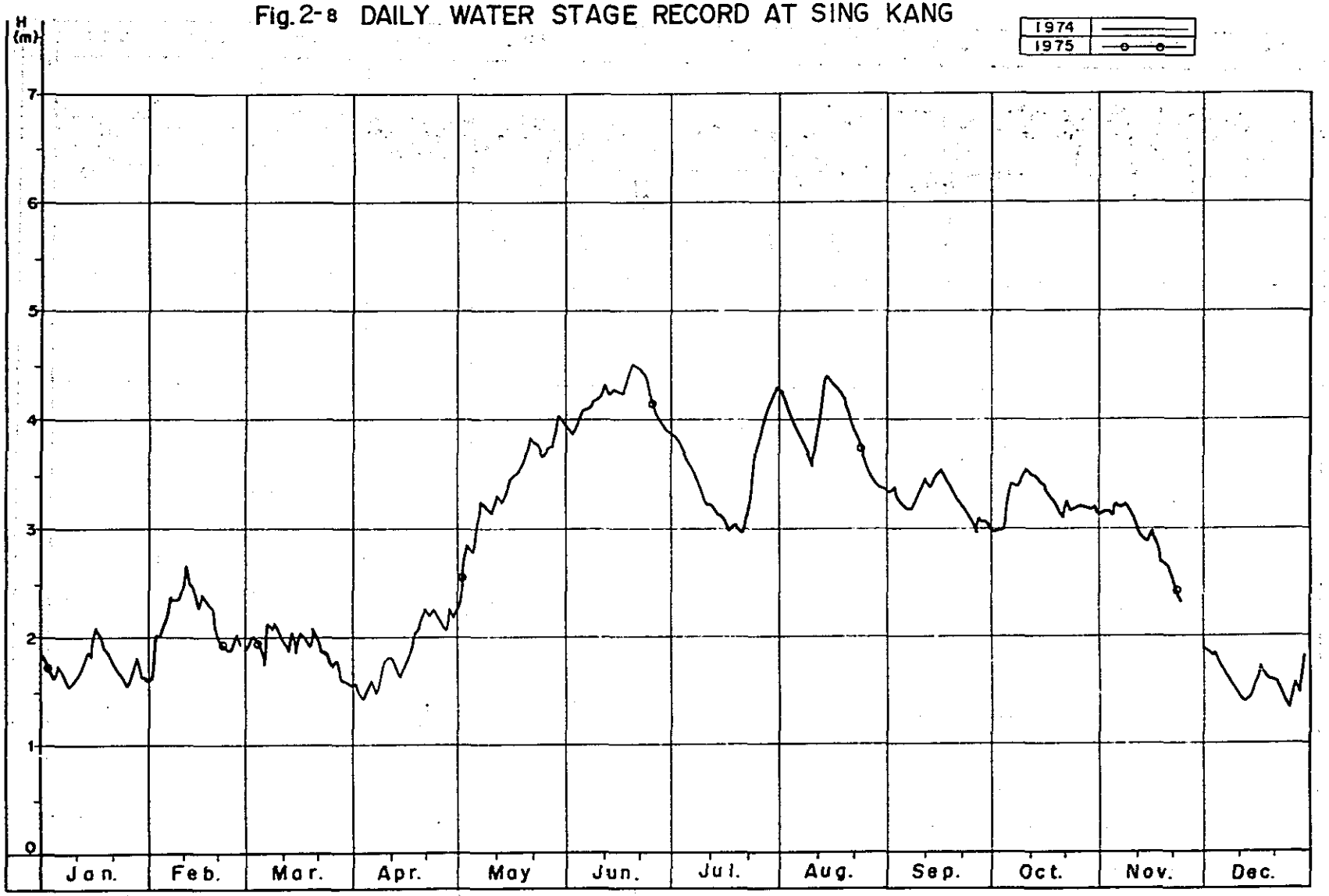


Fig.2-9 DAILY WATER STAGE RECORD AT S.SANREGO

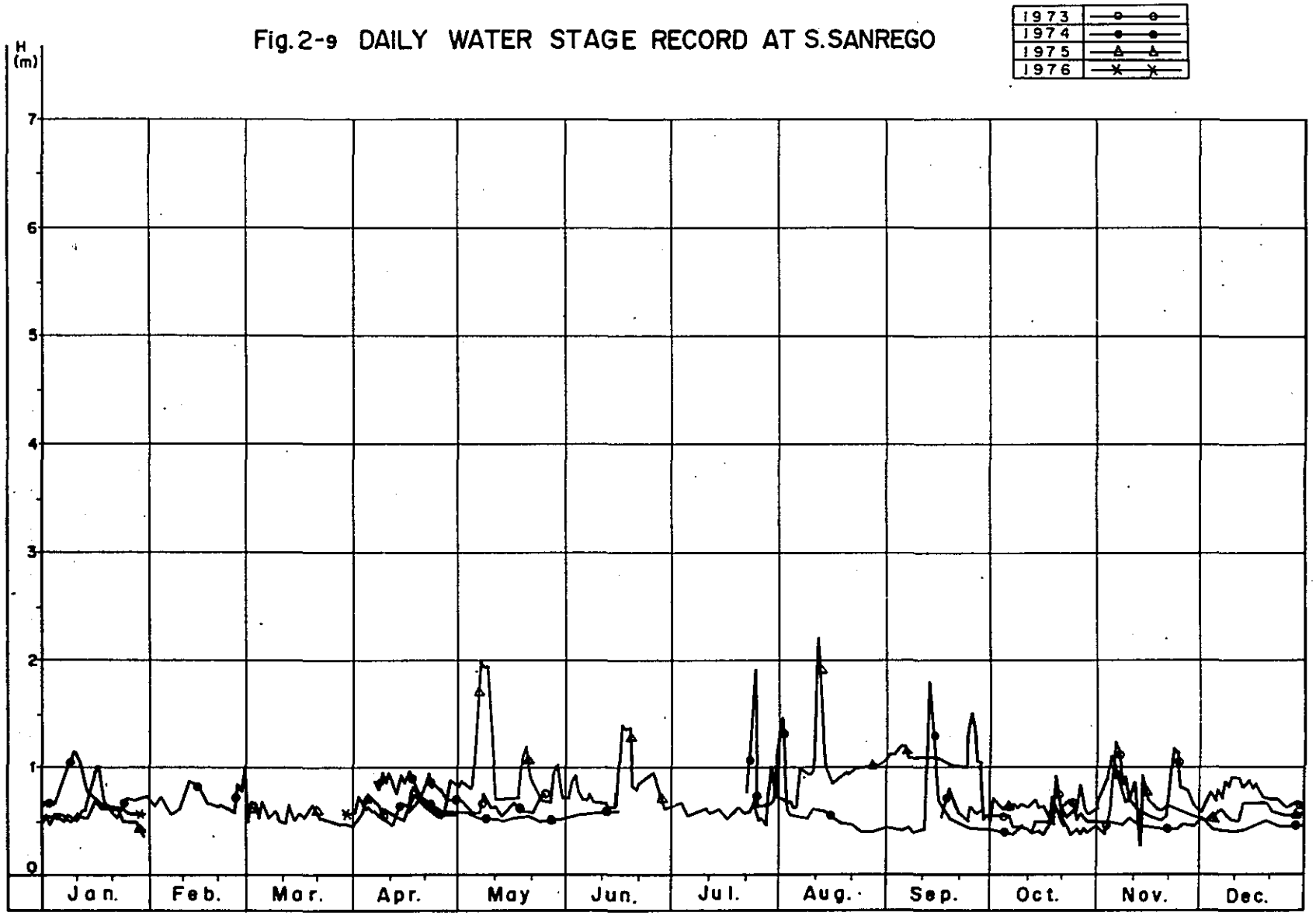


Fig.2-10 DAILY WATER STAGE RECORD AT BATUPUTE

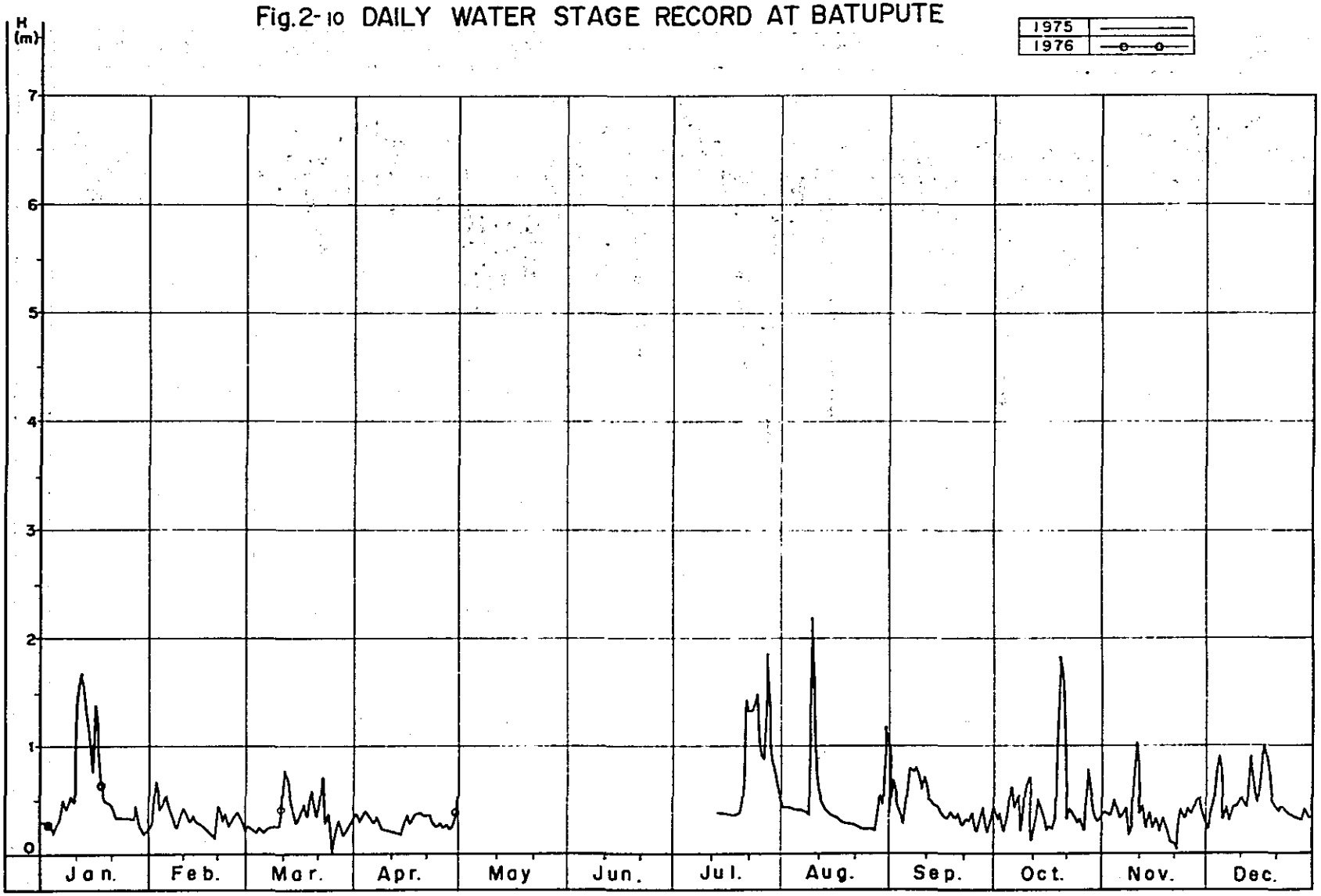


Fig.2-11 DAILY WATER STAGE RECORD AT UJUNG LAMURU

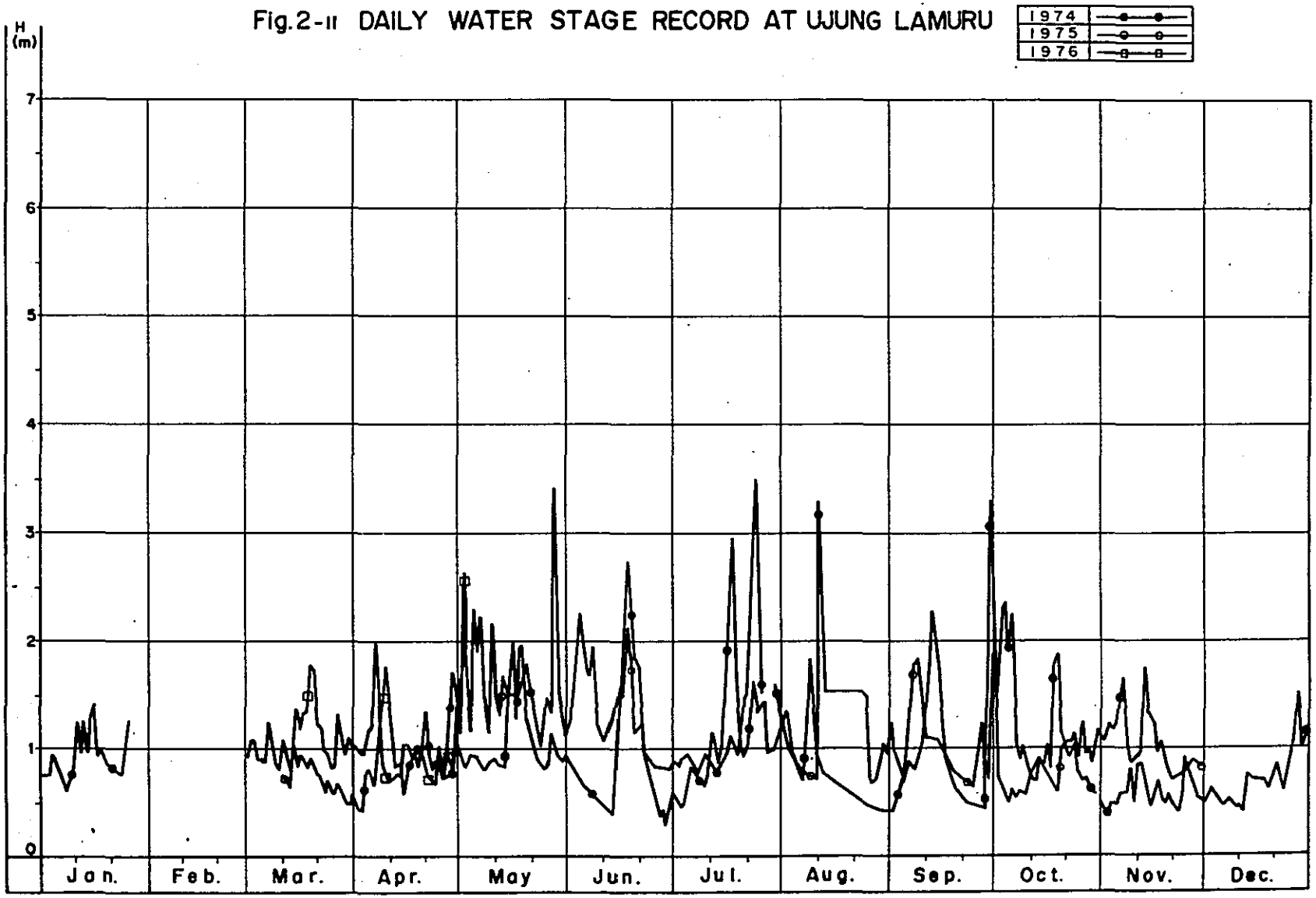


Fig.2-12 DAILY WATER STAGE RECORD AT LANG KEMME

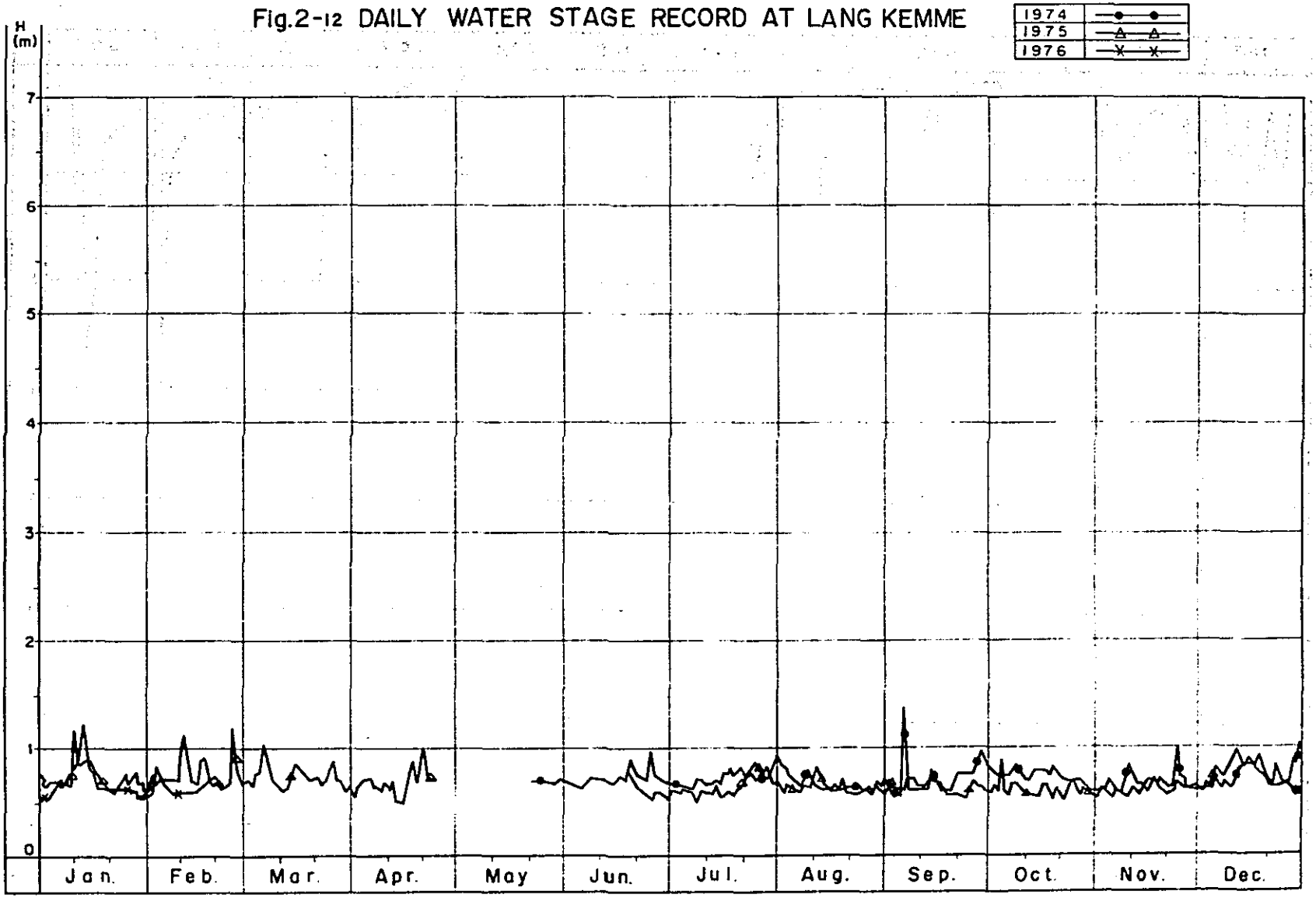


Fig. 2-13 DAILY WATER STAGE RECORD AT SERO

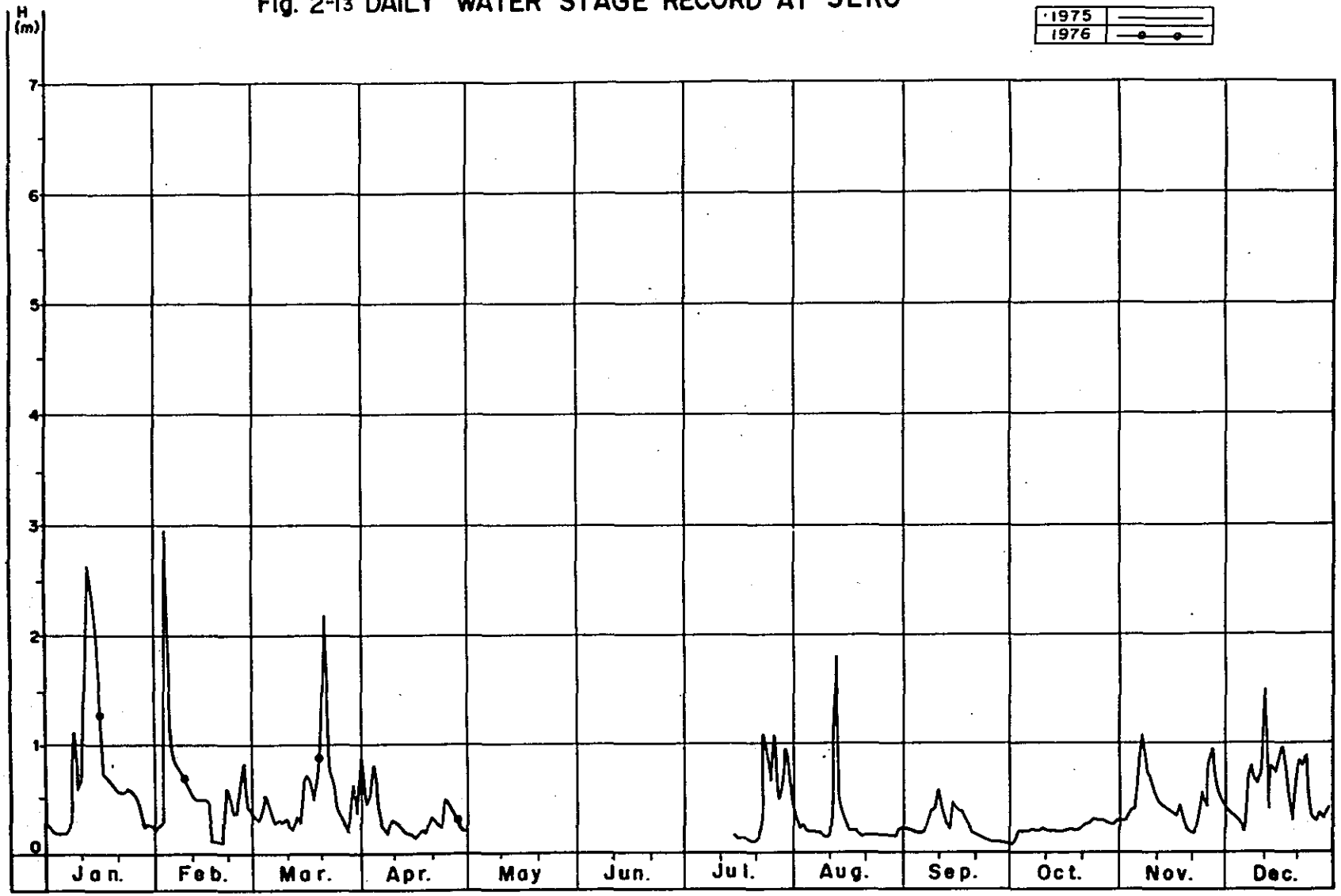


Fig.2-14 DAILY WATER STAGE RECORD AT PANTJONG KANG

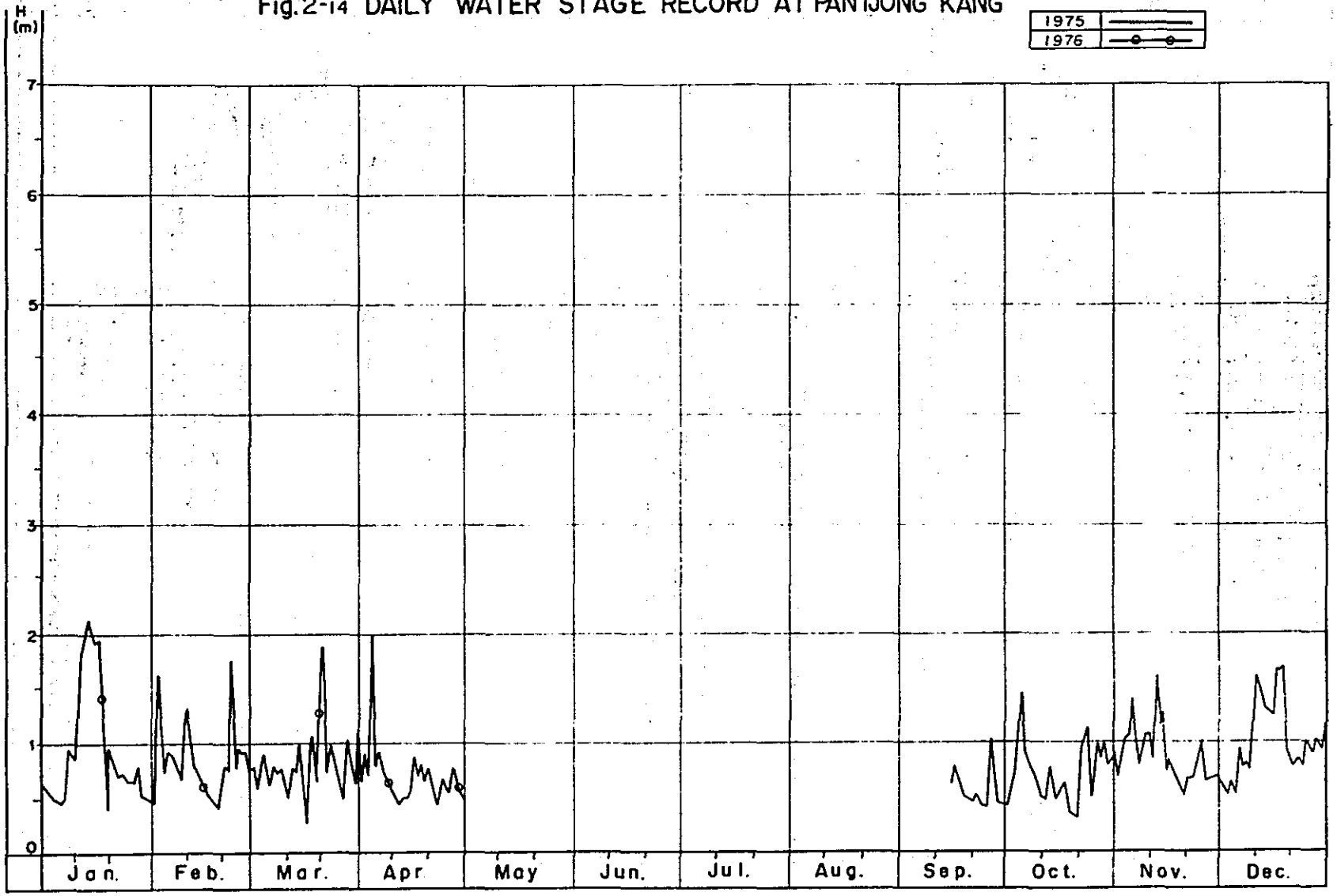


Fig. 2-15 DAILY WATER STAGE RECORD AT LAKIBONG

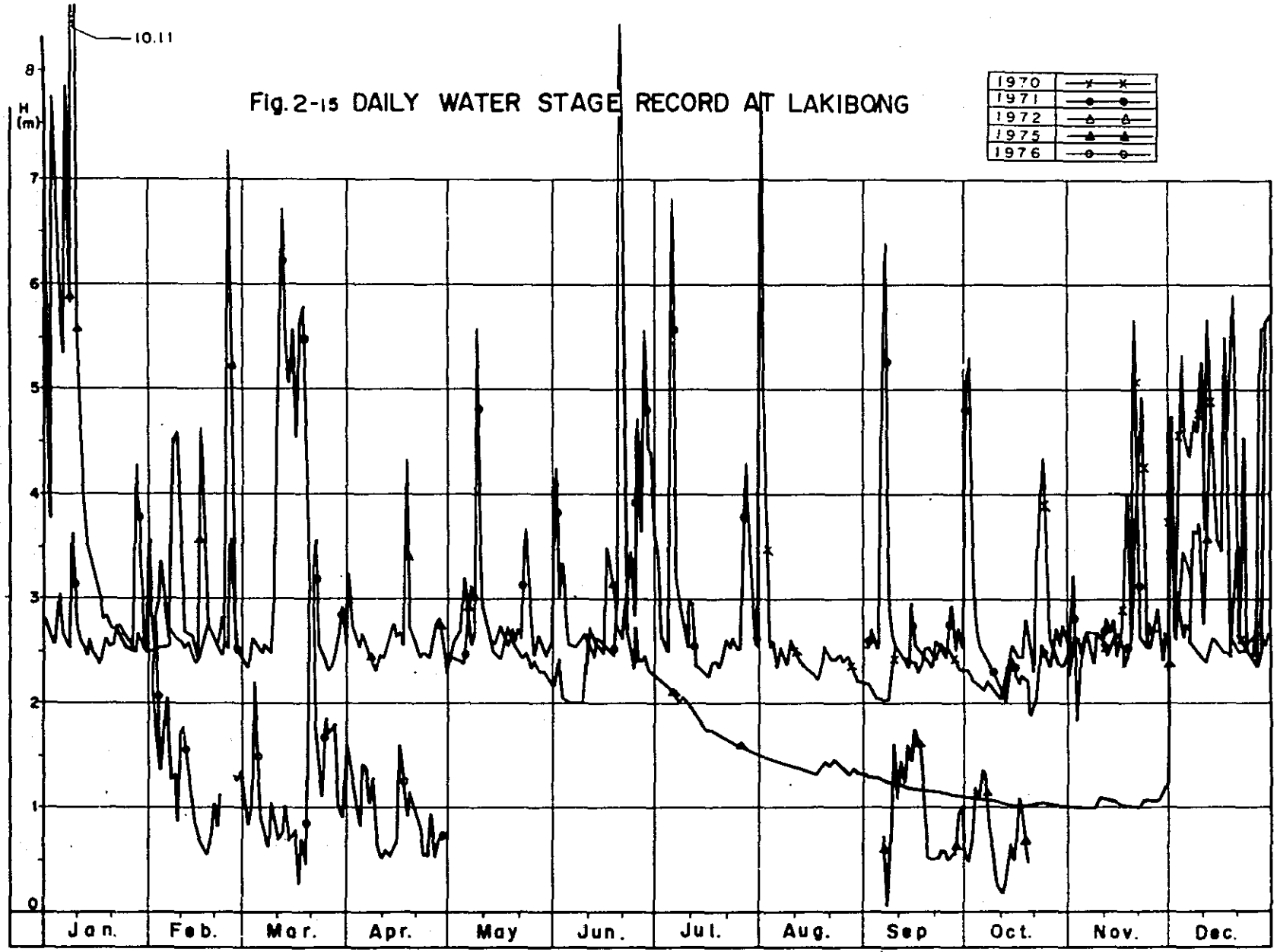


Fig. 2-16 DAILY WATER STAGE RECORD AT CABBENGI

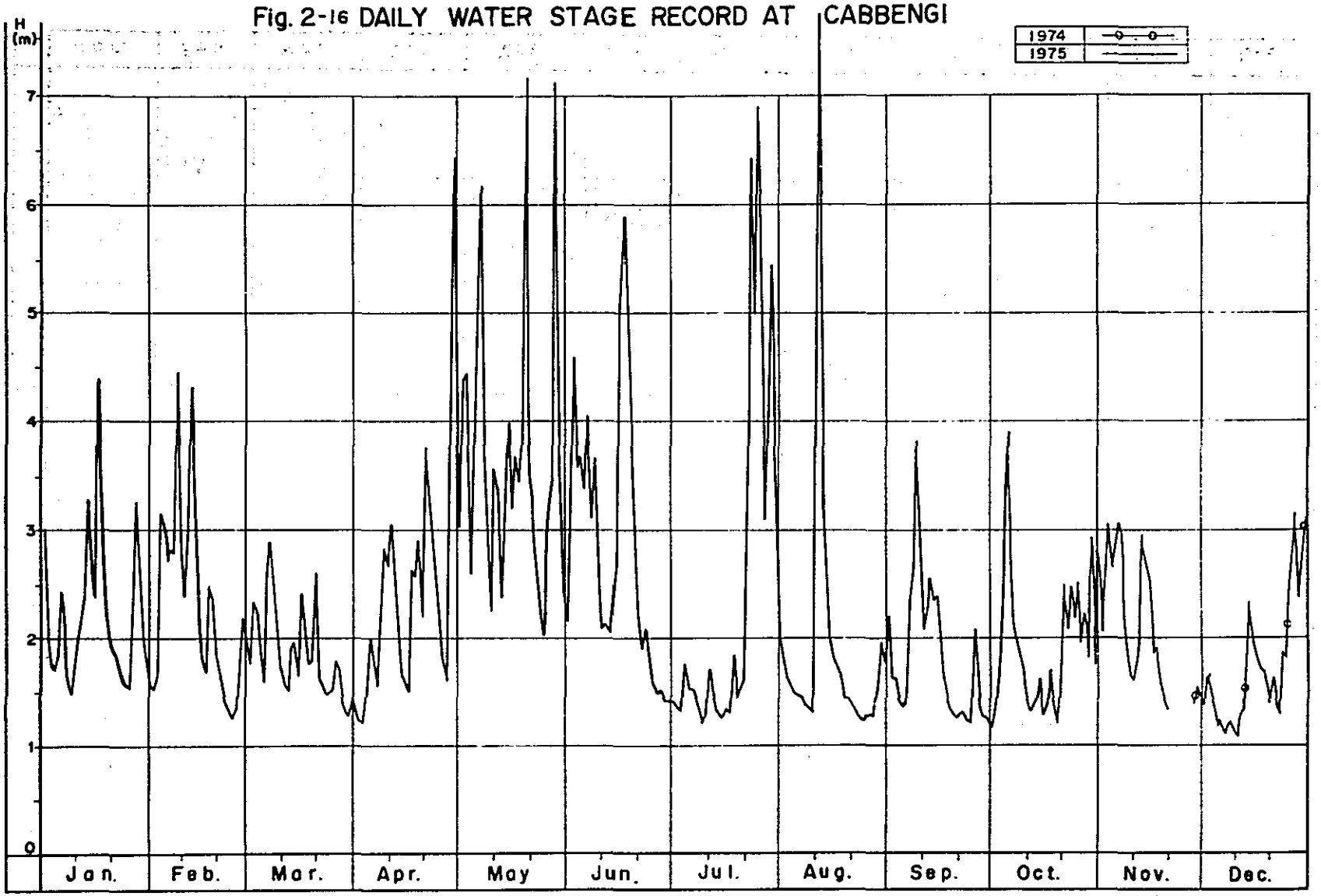


Fig. 2-17 DAILY WATER STAGE RECORD AT WAGE

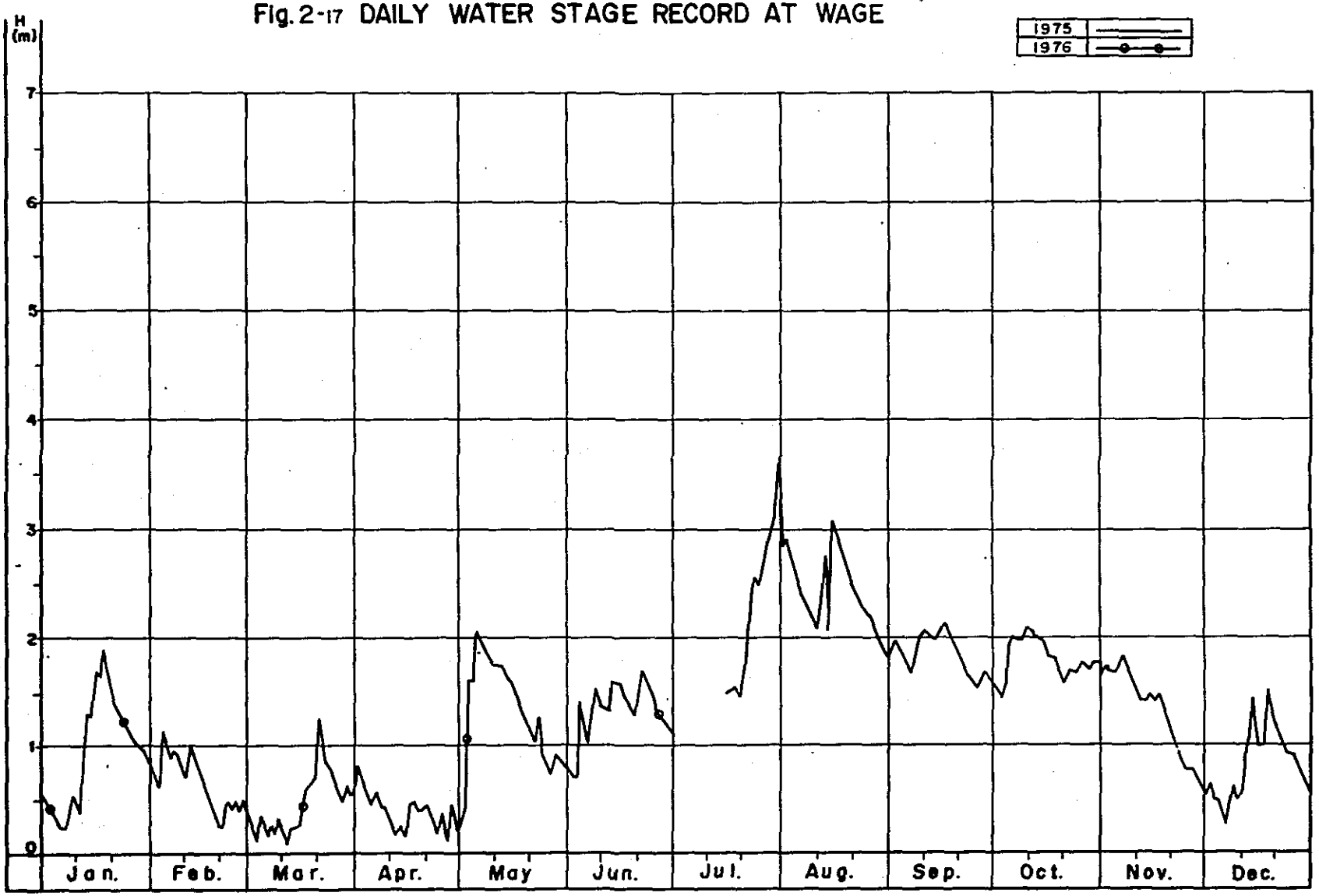


Fig. 2-18 DAILY WATER STAGE RECORD AT LAWO

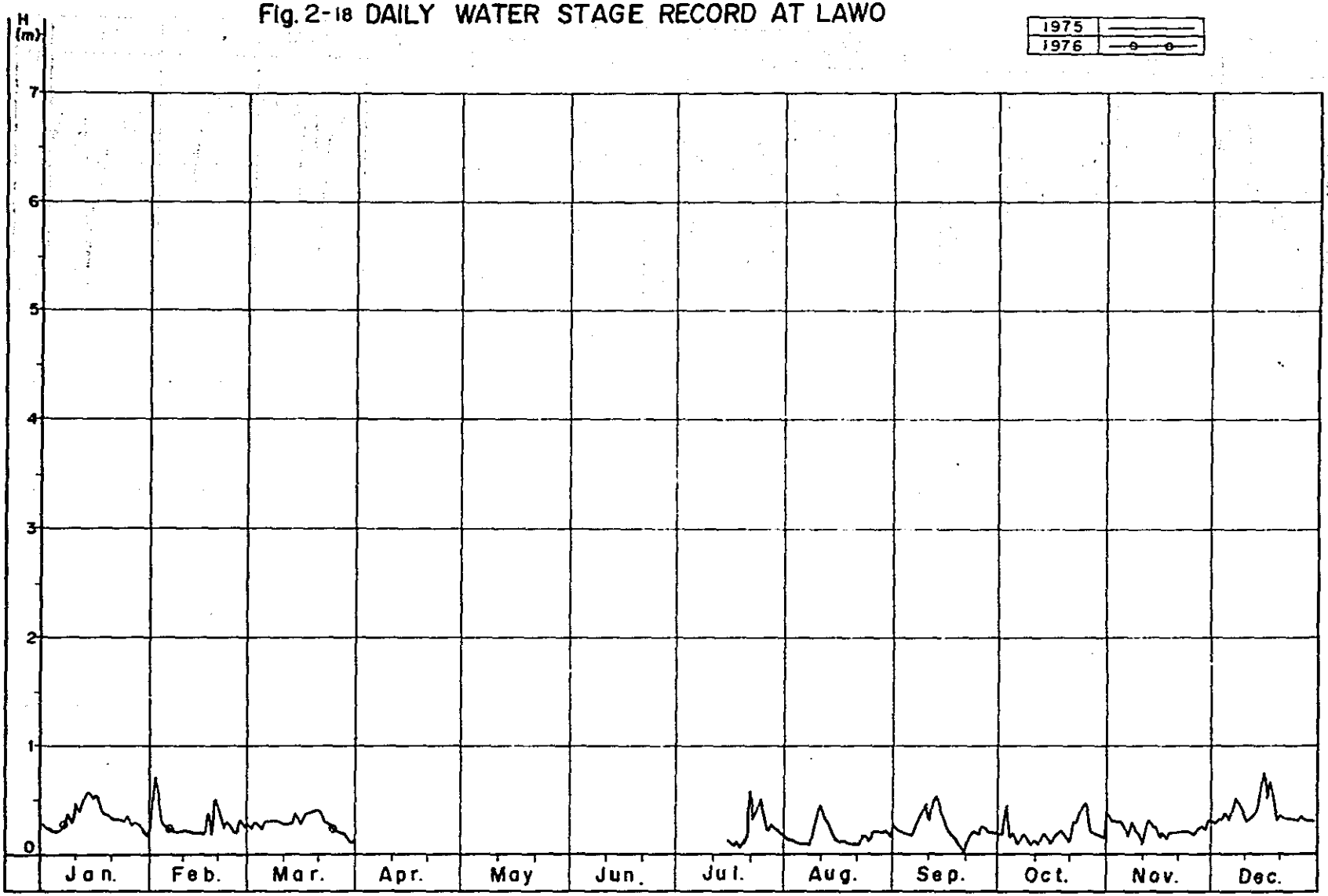


Fig.2-19 DAILY WATER STAGE RECORD AT BATUBATU

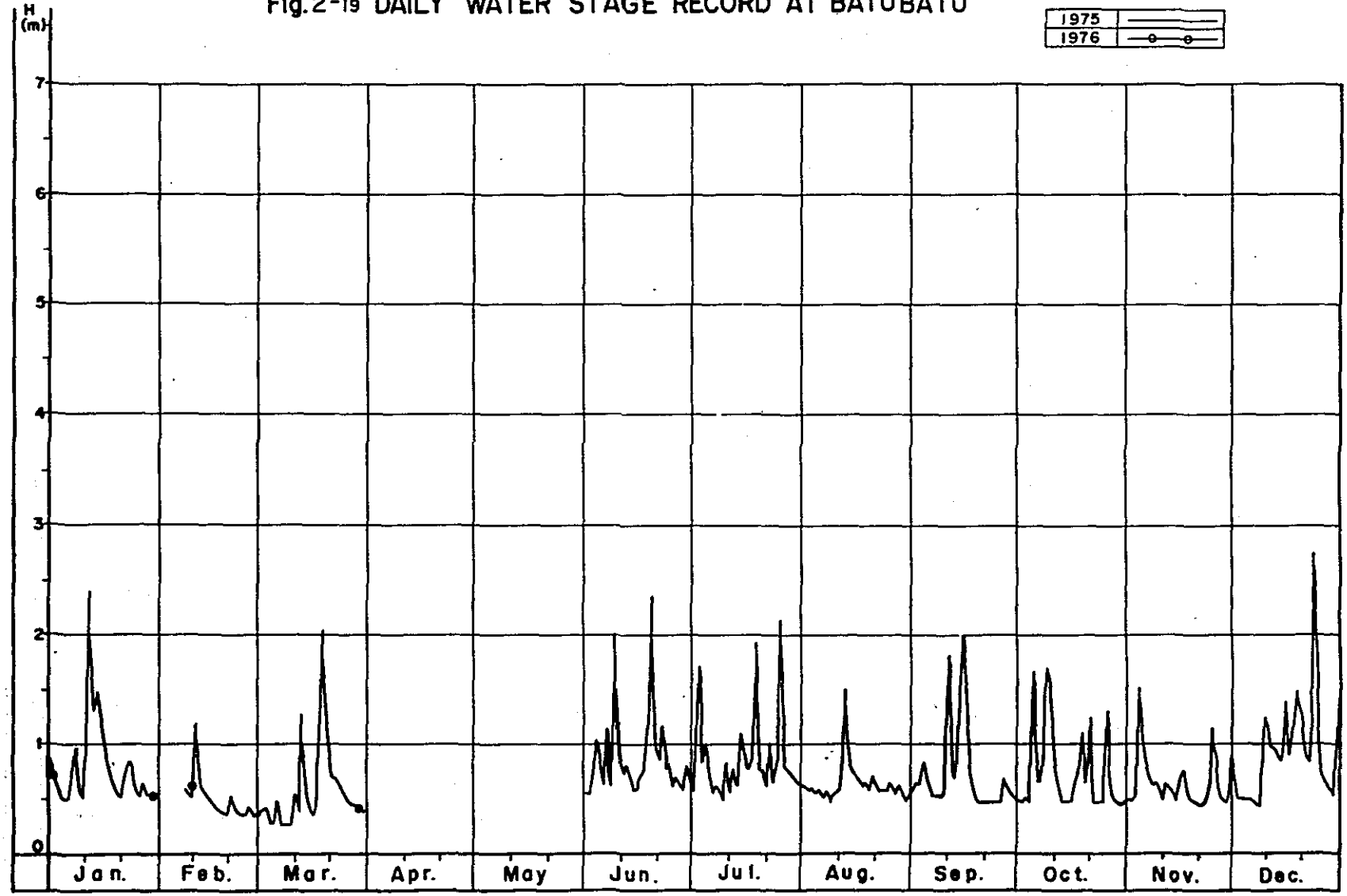


Fig.2-20 DAILY WATER STAGE RECORD AT D.TEMPE

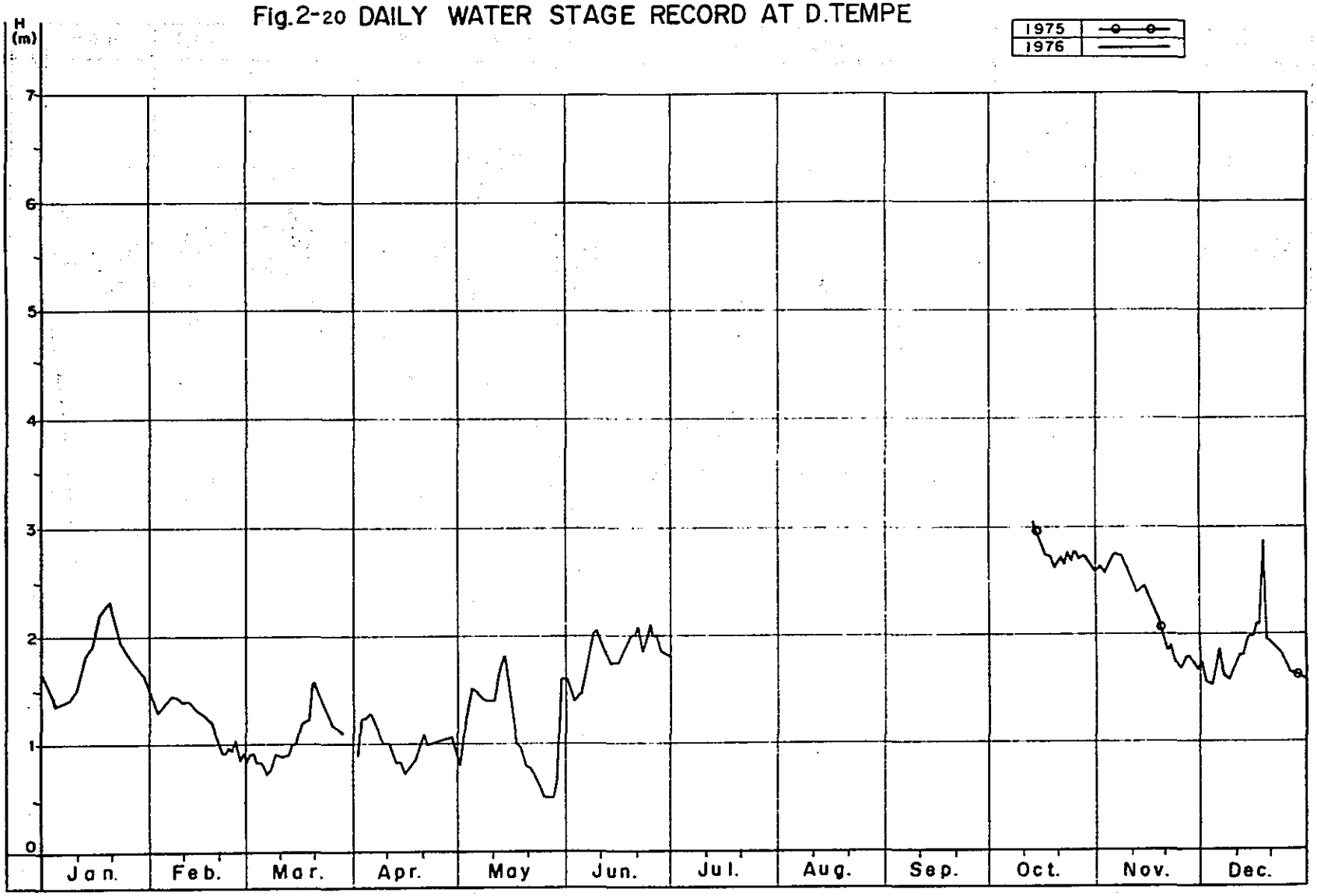


Fig. 2-21 DAILY WATER STAGE RECORD AT L.TEMPE (LARINGGI)

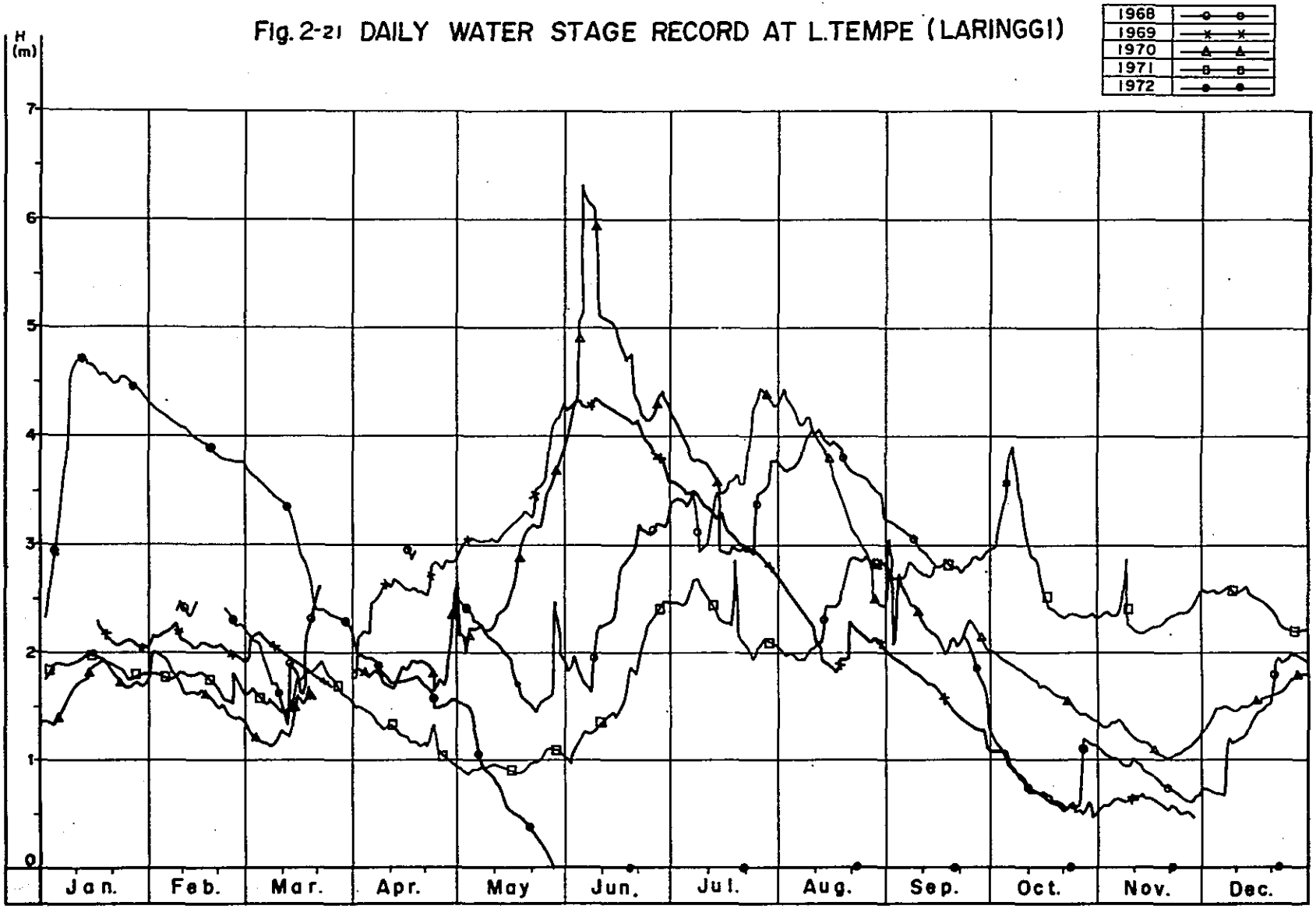


Fig. 2-22 DAILY WATER STAGE RECORD AT D.SIDENRENG

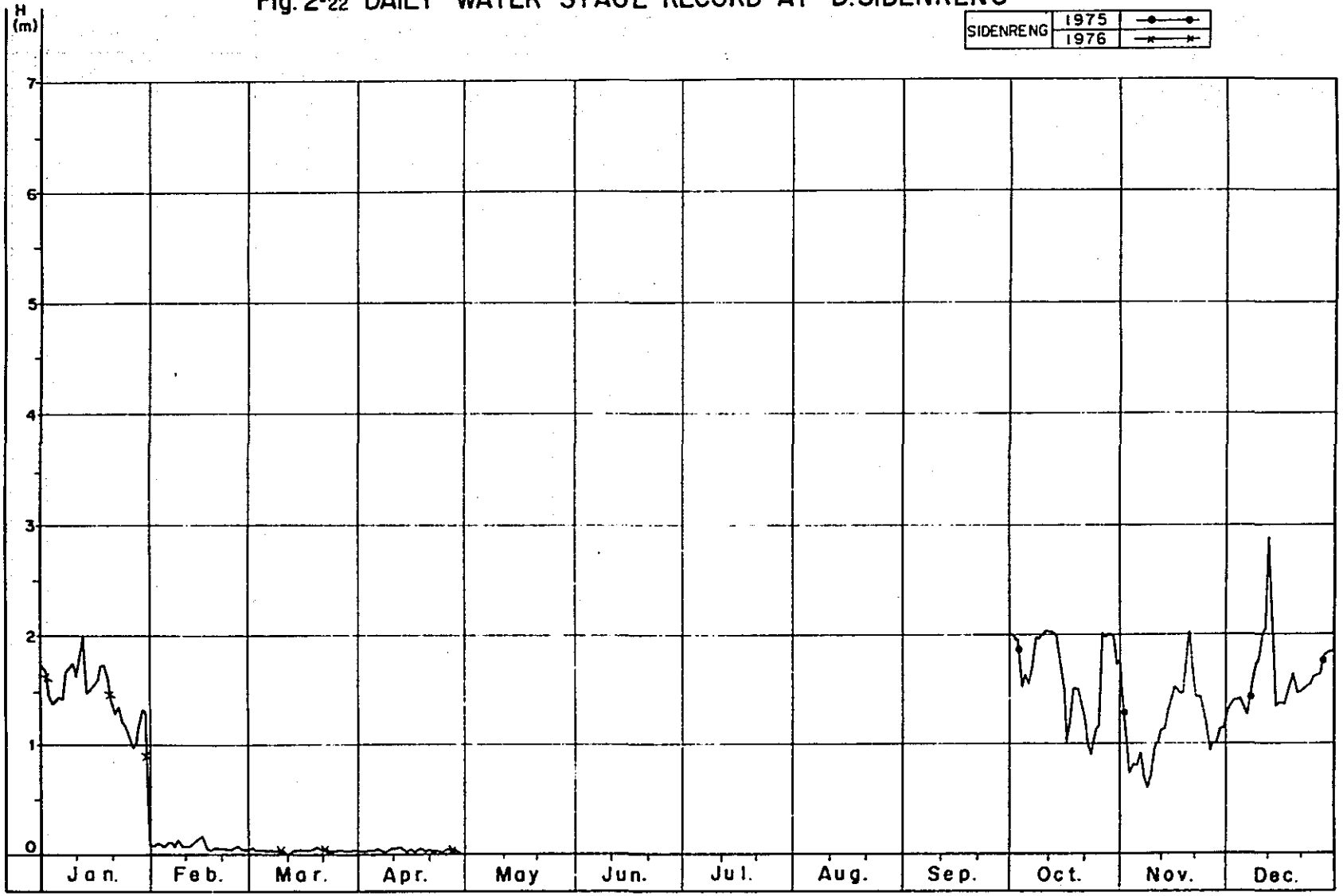


Fig. 2-23 DAILY WATER STAGE RECORD AT GILIRANG

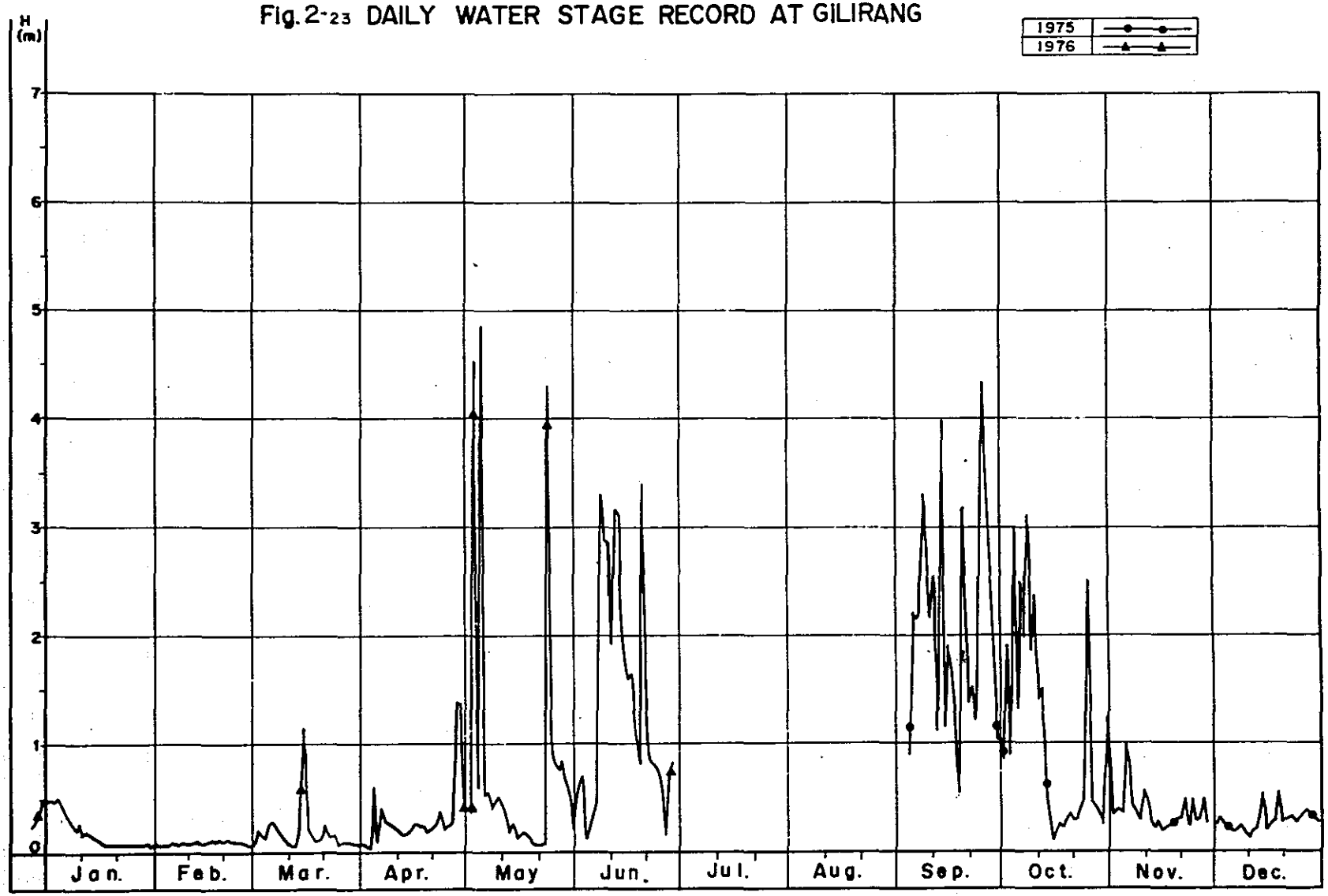


Fig. 2-24 DAILY WATER STAGE RECORD AT TARUMPAKAE (SAKOLI)

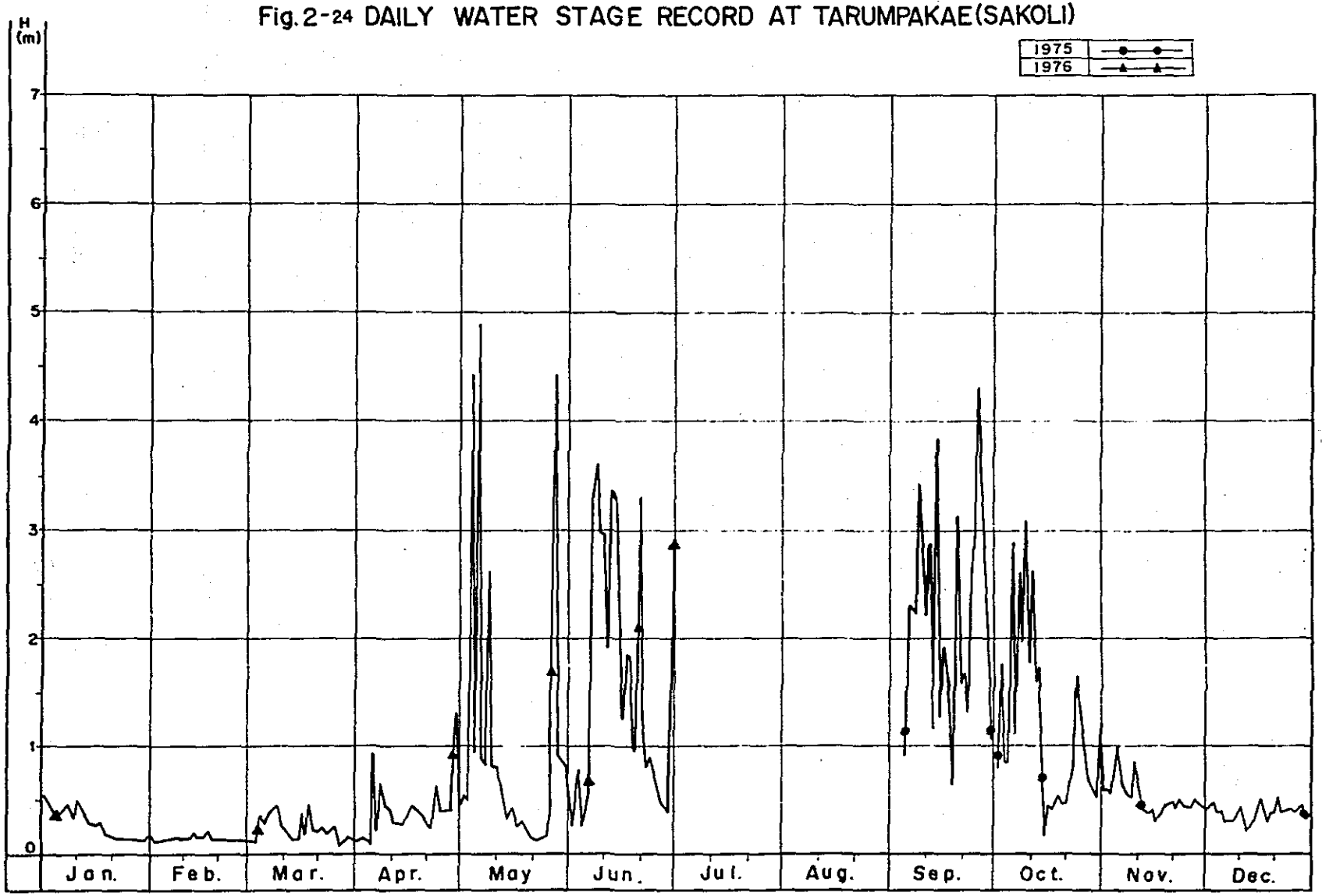


Fig. 3-1 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

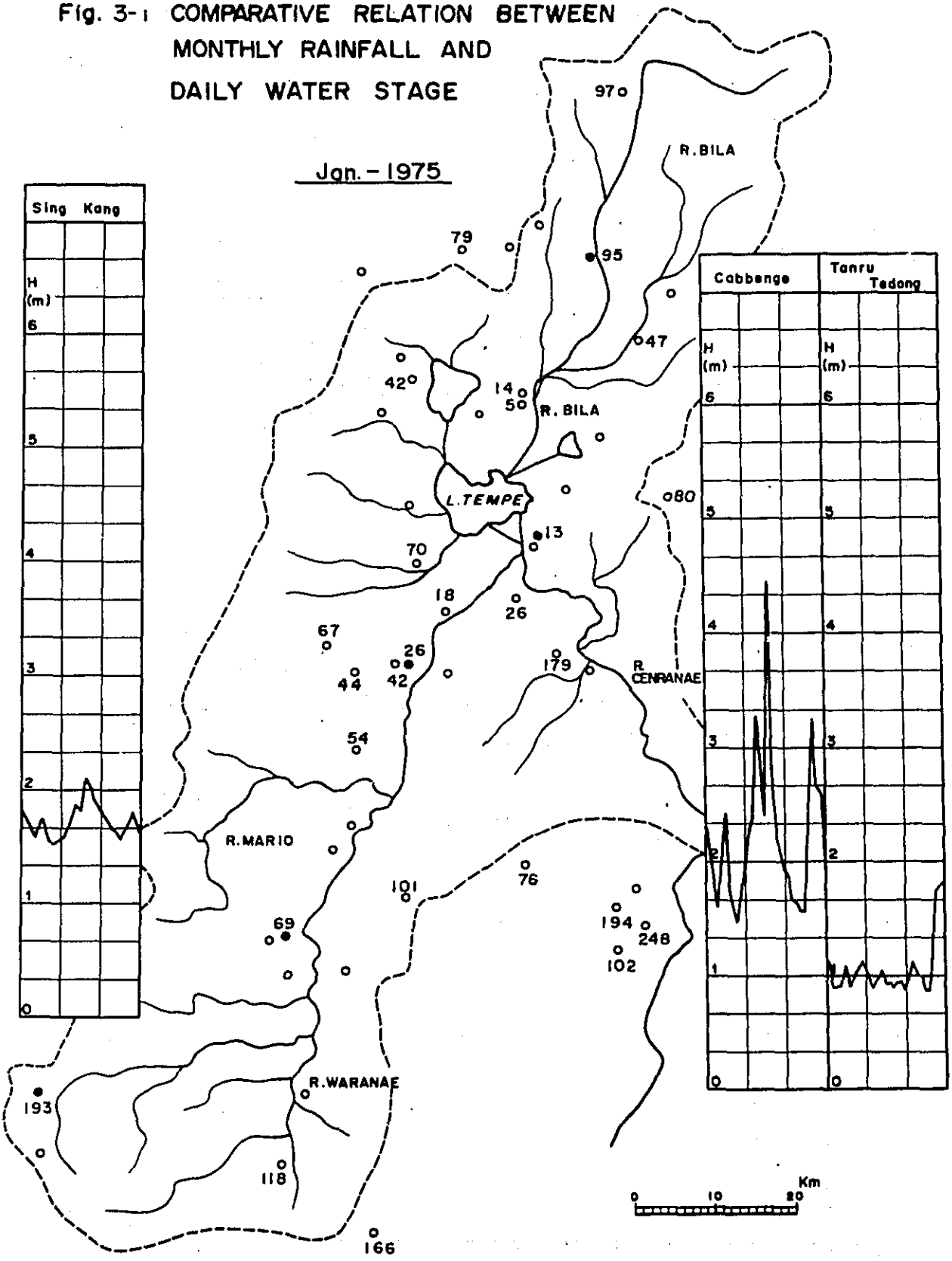


Fig. 3-2 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

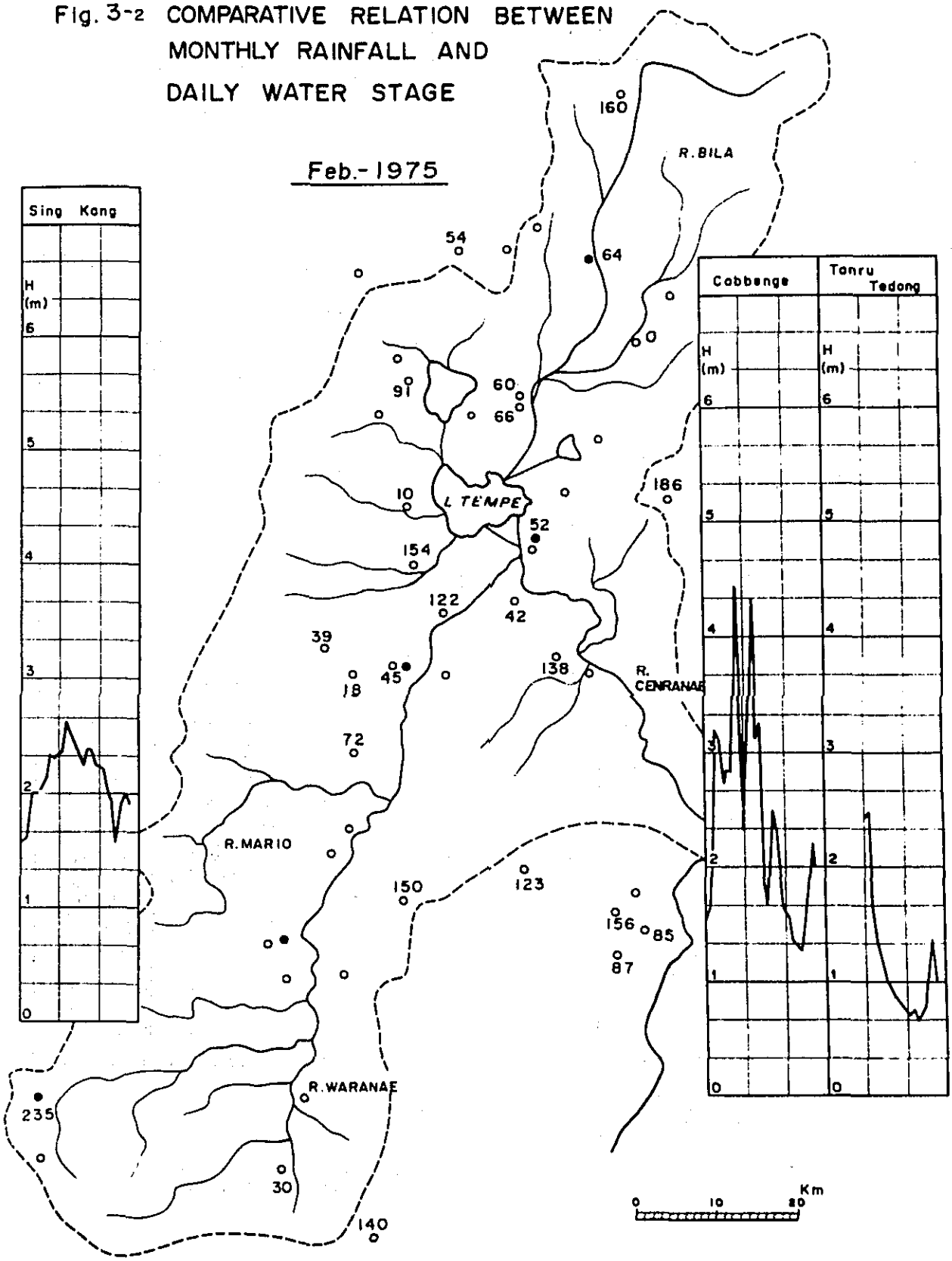


Fig. 3-3 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

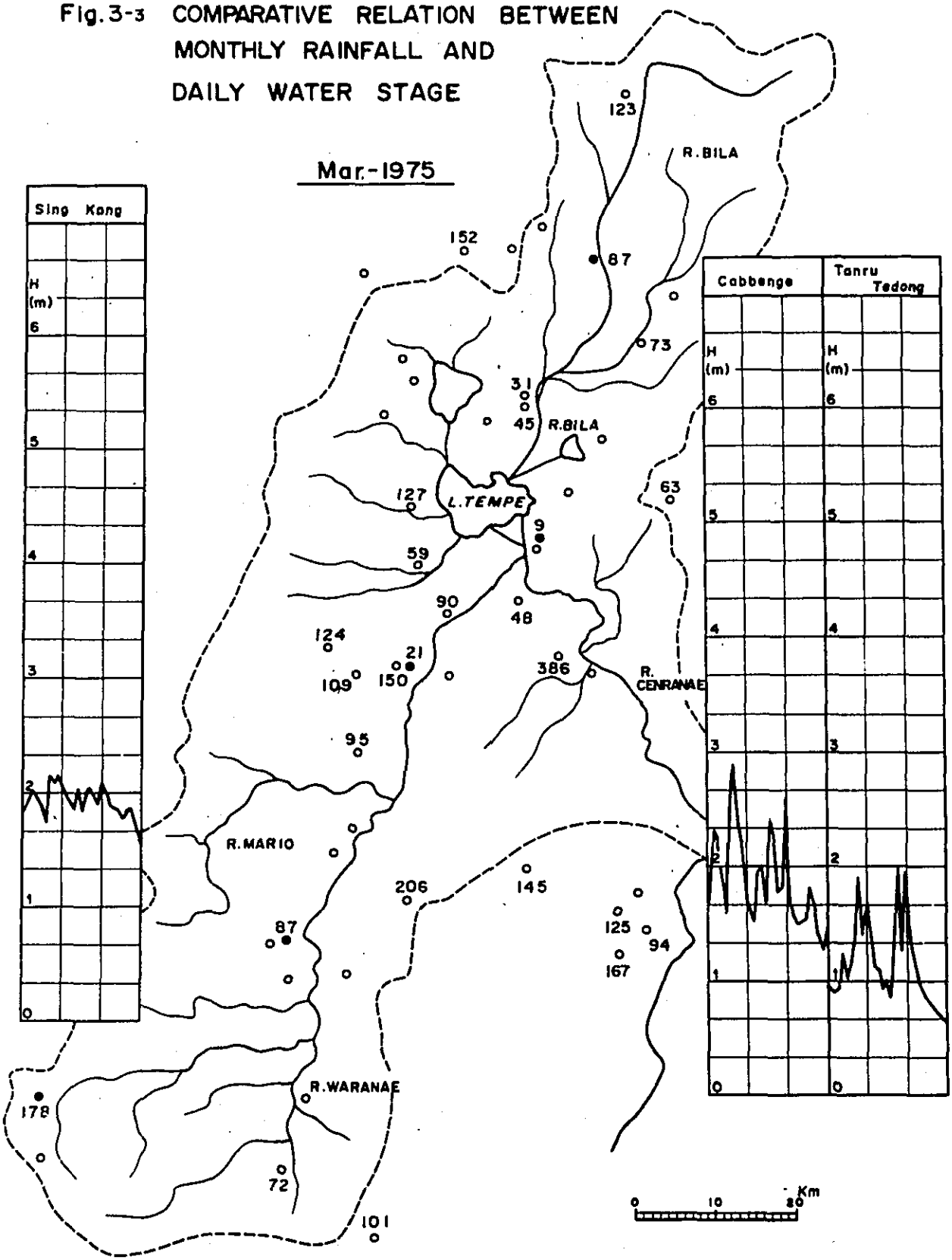


Fig. 3-4 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

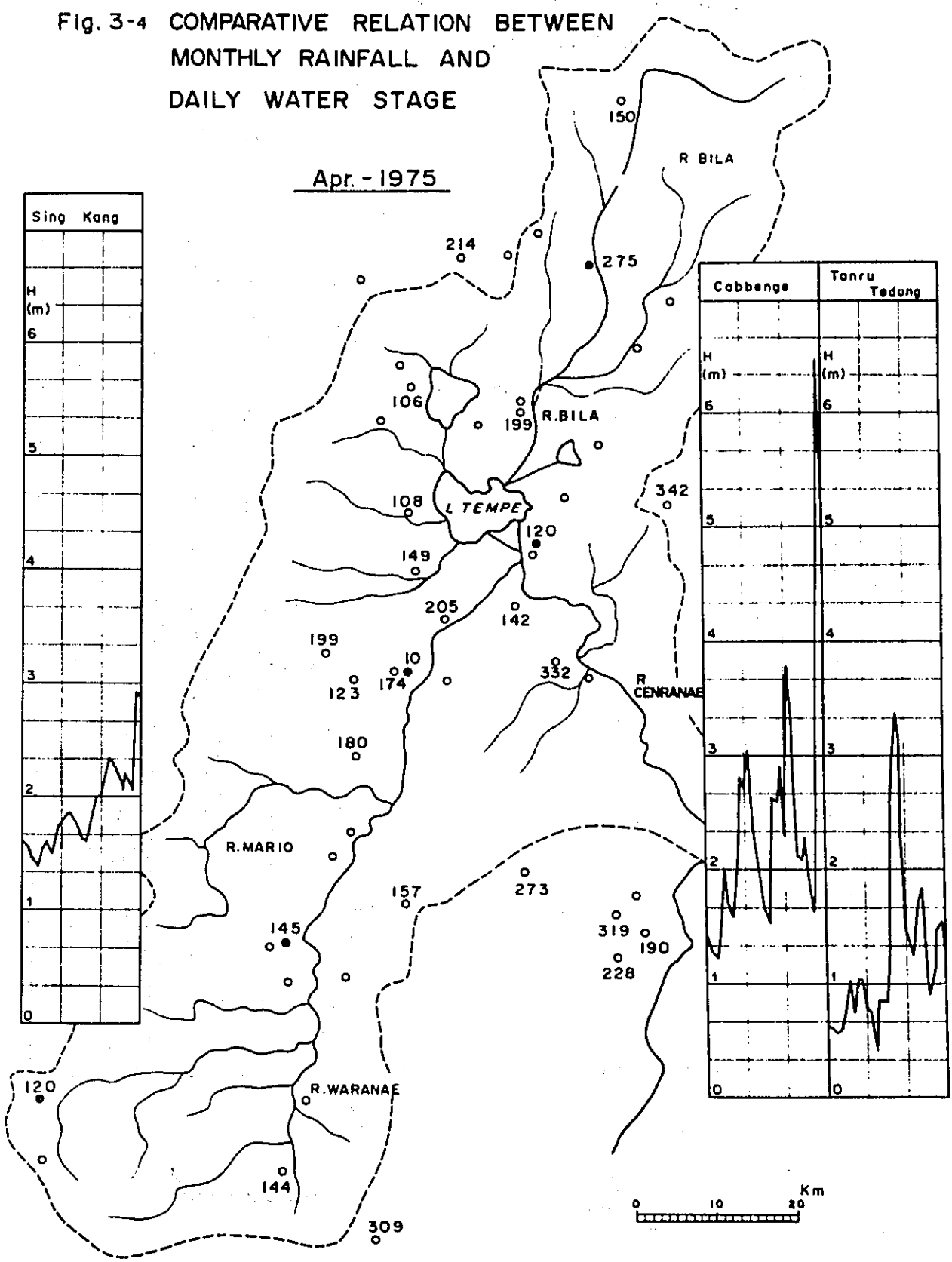


Fig. 3-5 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

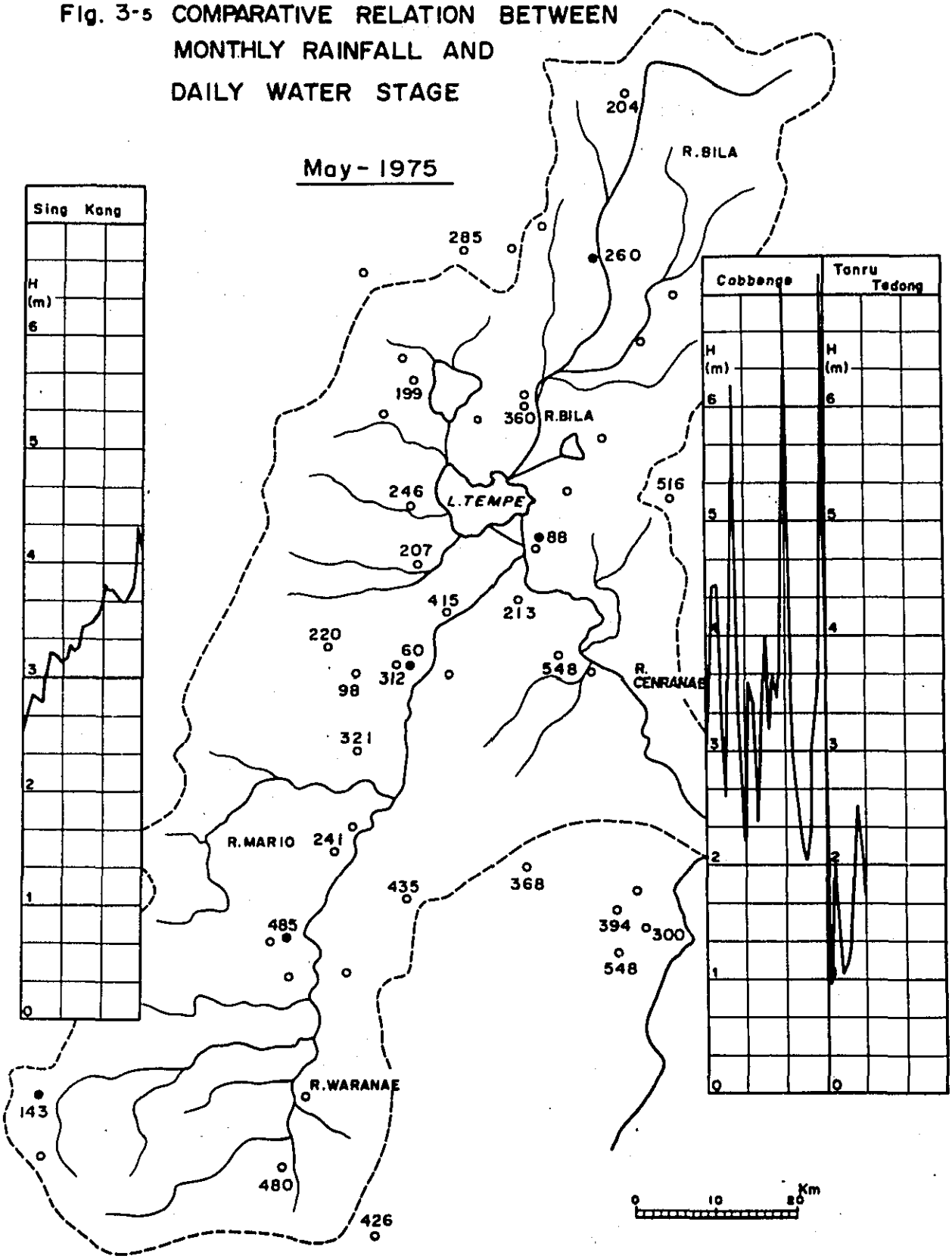


Fig. 3-6 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

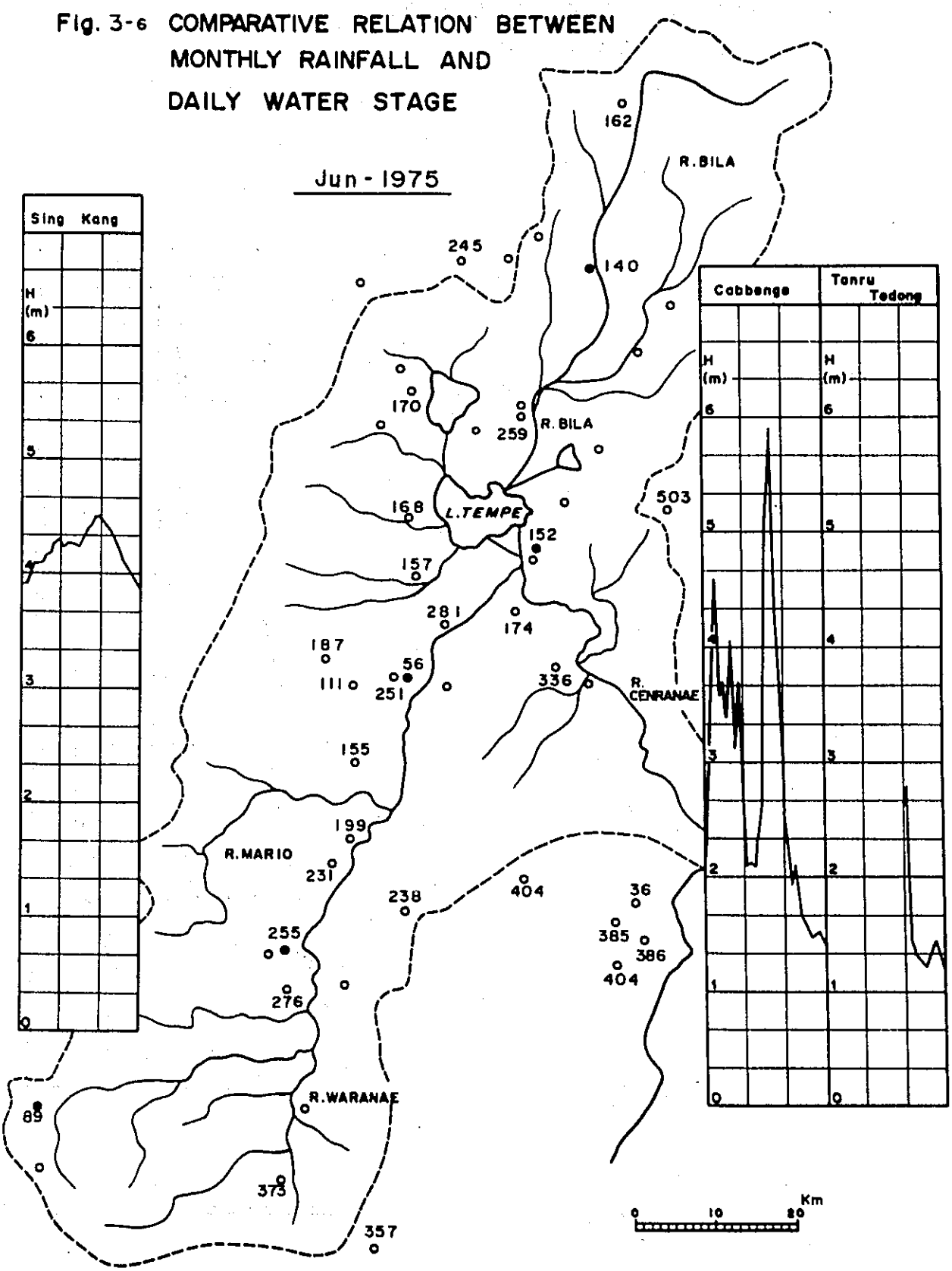


Fig. 3-7 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

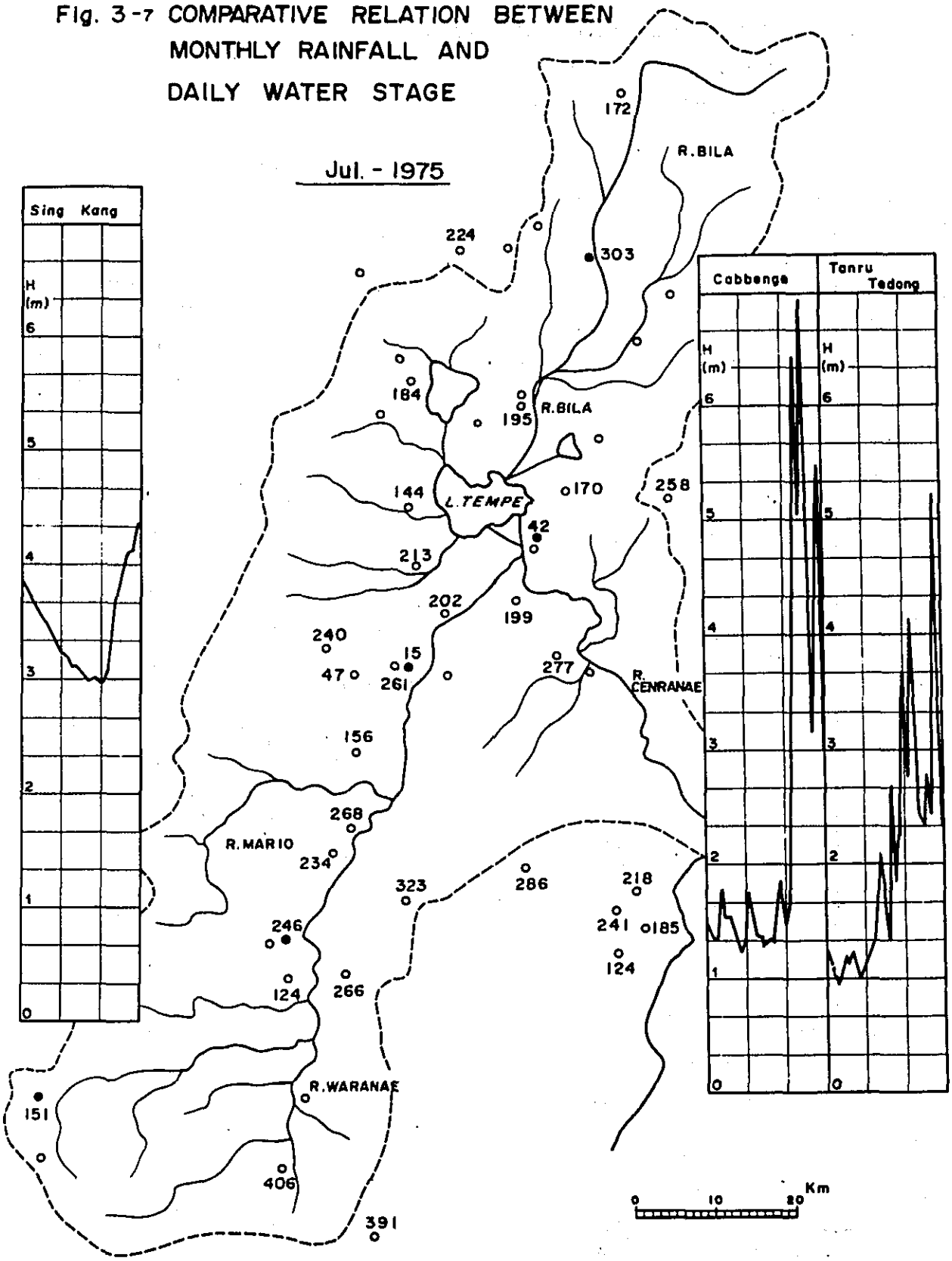


Fig. 3-8 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

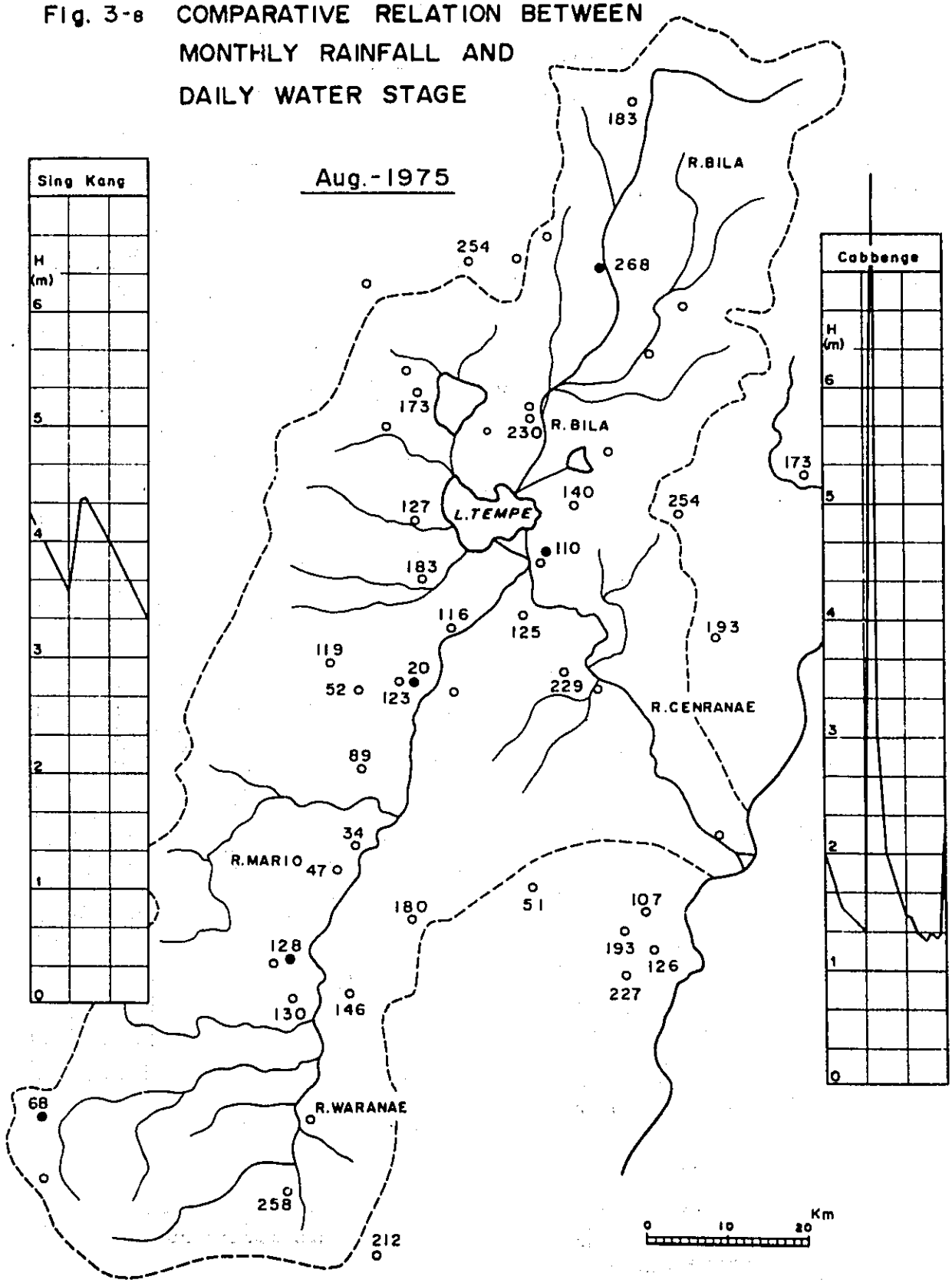


Fig. 3-9 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

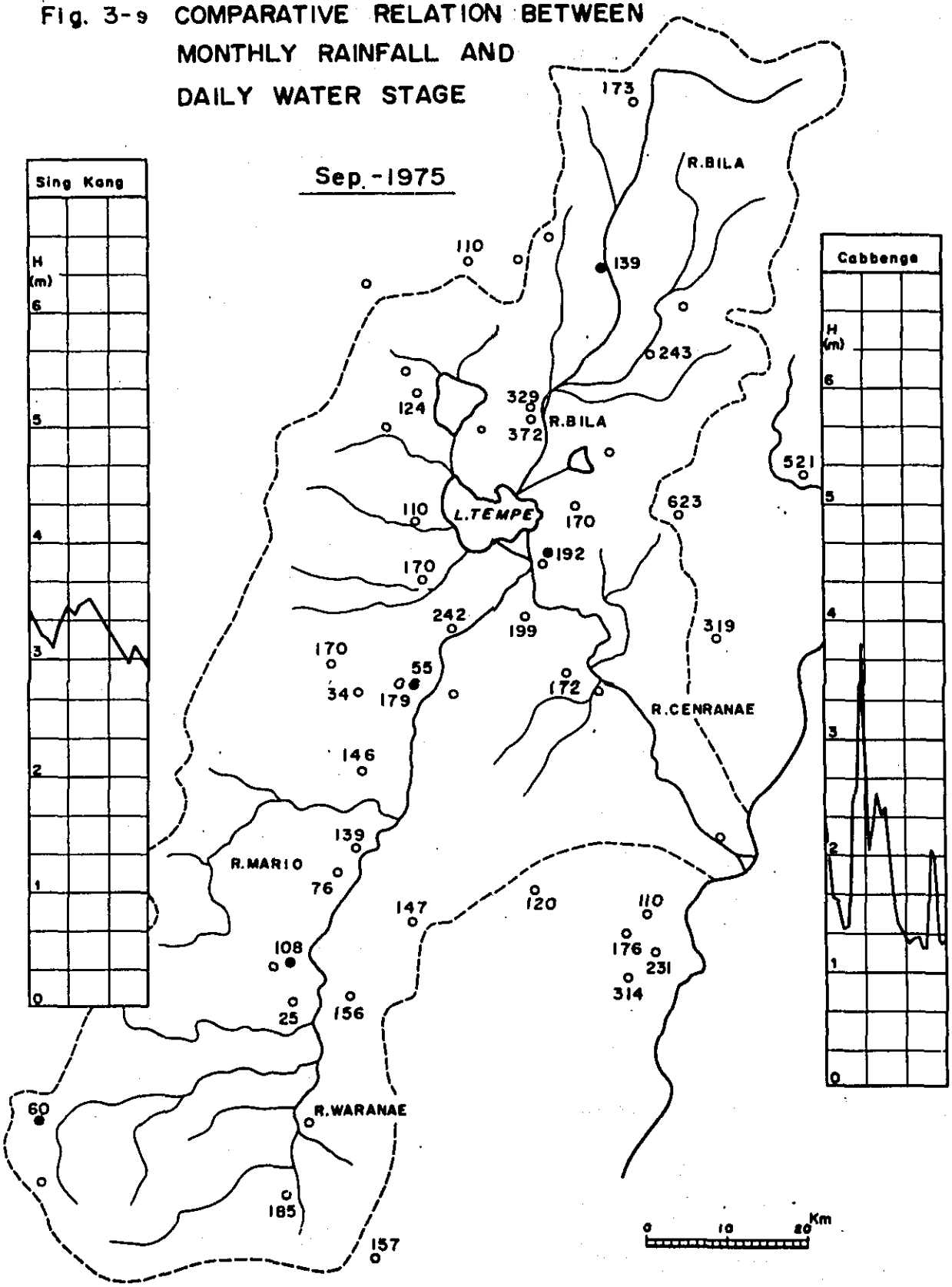


Fig. 3-10 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

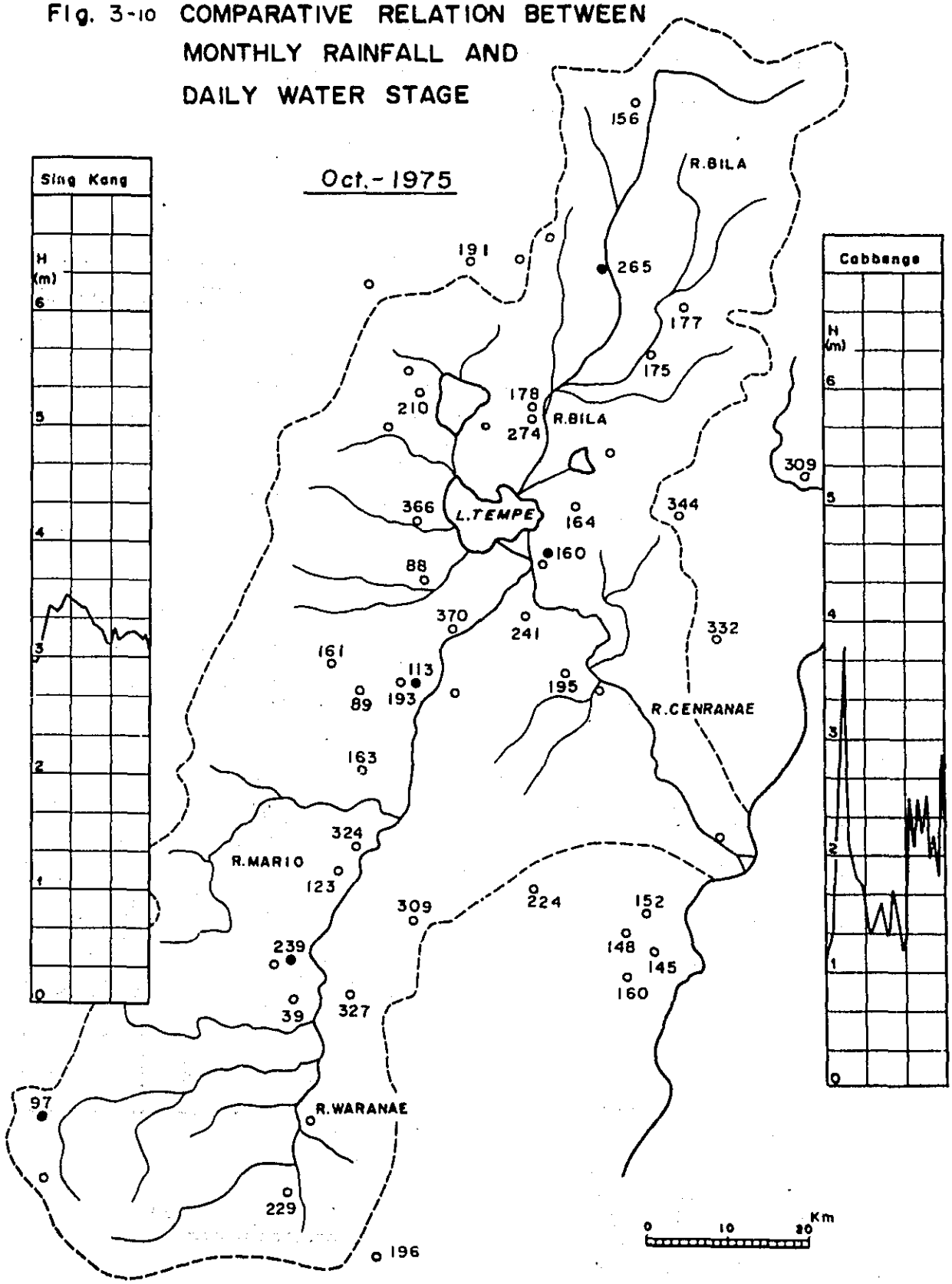


Fig. 3-11 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

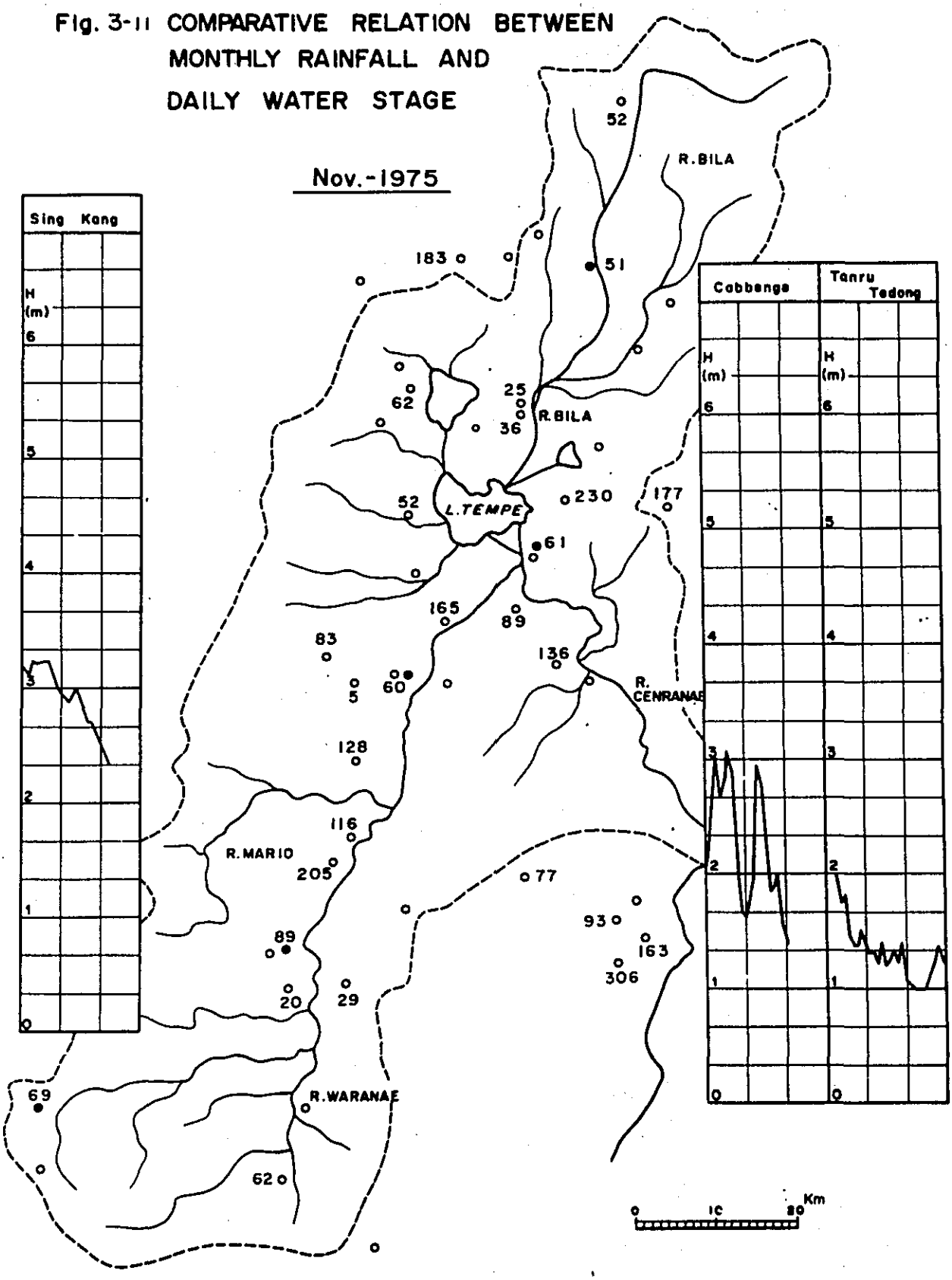


Fig. 3-12 COMPARATIVE RELATION BETWEEN MONTHLY RAINFALL AND DAILY WATER STAGE

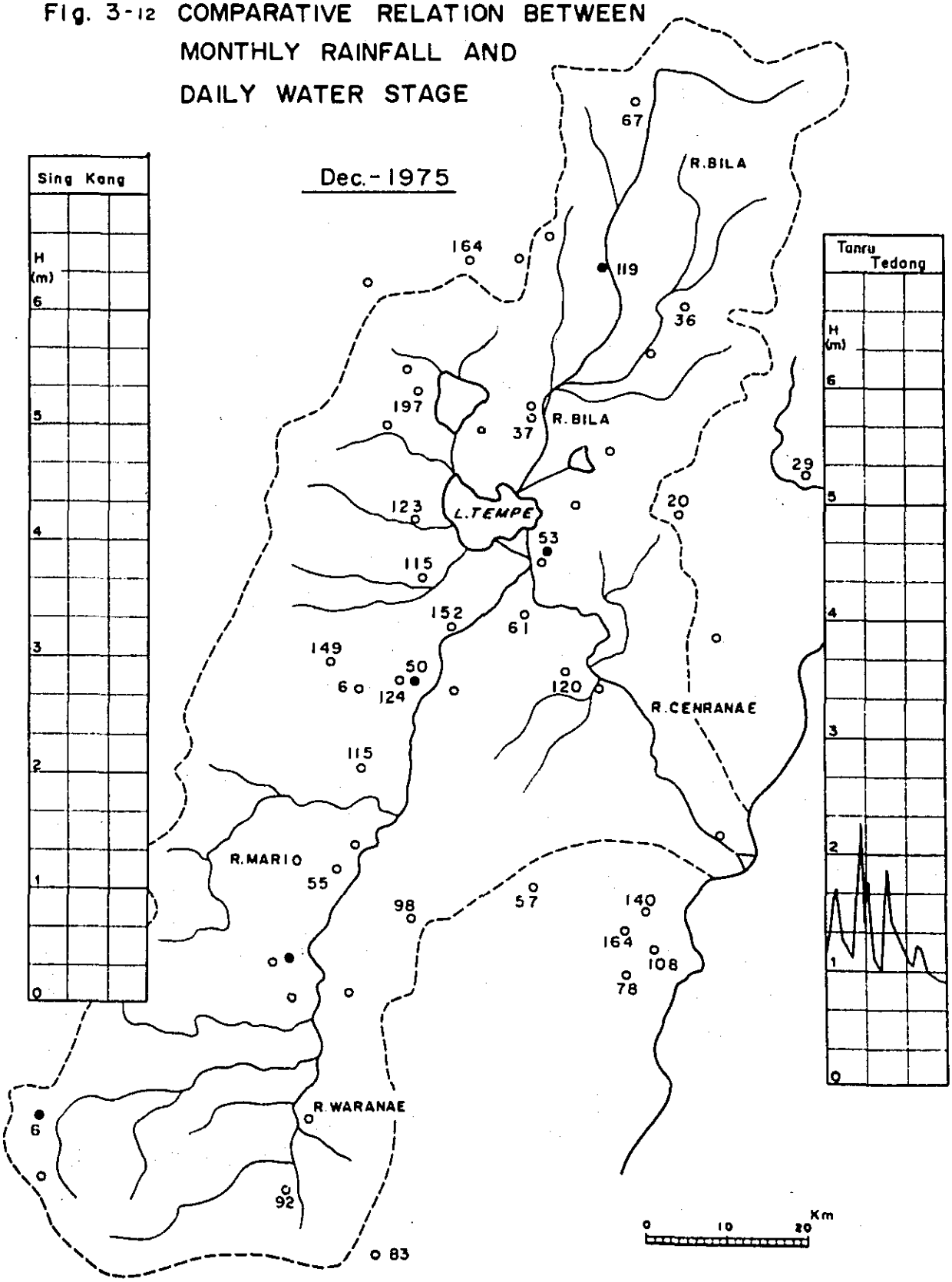
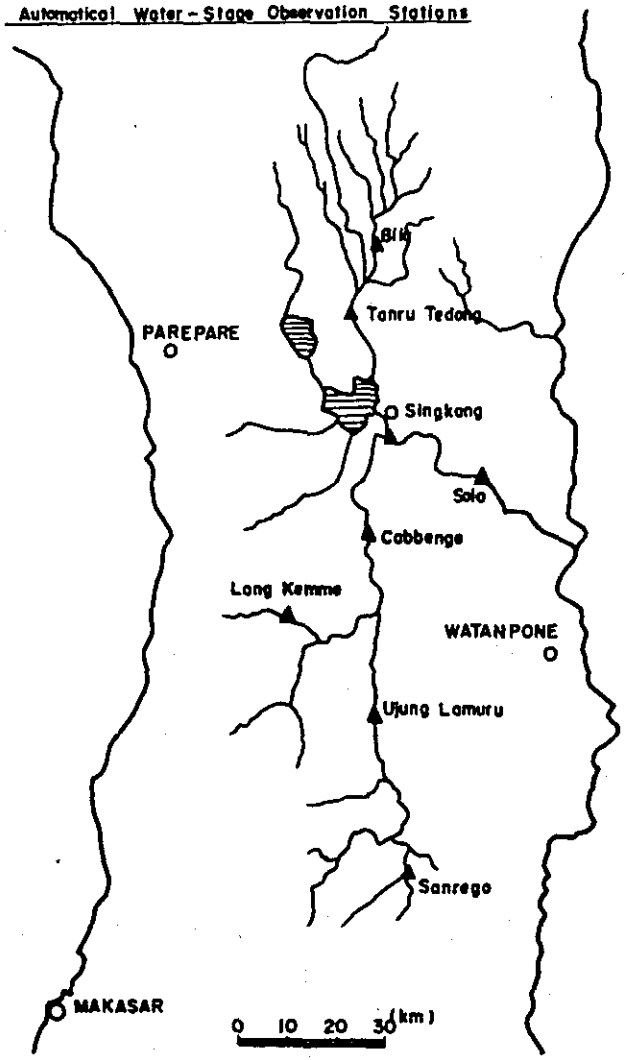


Table 7 MAIN FLOODS TABLE IN 1974 AND 1975



Main Floods

No.	Ujung Lamuru in Walanae R. Period	No.	Tanru Tedong in Bila R. Period
1	20/7 ~ 31/7 , 1975 *	11	1/12 ~ 3/12 , 1975
2	13/6 ~ 21/6 , 1975		10/7 ~ 29/7 , 1975 *
3	26/5 ~ 31/5 , 1975	12	24/12 ~ 26/12 , 1974
4	20/4 ~ 30/4 , 1975	13	7/12 ~ 10/12 , 1974
5	26/9 ~ 2/10 , 1974 **	14	1/12 ~ 4/12 , 1974
6	10/9 ~ 16/9 , 1974 ***	15	8/11 ~ 14/11 , 1974
7	6/8 ~ 10/8 , 1974	16	13/10 ~ 23/10 , 1974
8	14/7 ~ 20/7 1974		26/9 ~ 1/10 1974 **
9	17/6 ~ 23/6 , 1974		2/9 ~ 19/9 , 1974 ***
10	15/5 ~ 20/5 , 1974	17	7/7 ~ 13/7 , 1974

Remarks: Floods of * -marks mean that rainfall had happend at the same time in both river systems. In deciding design dischonge, these rainfall conditions should be taken into consideration.

Fig. 4-1 MAIN FLOODS HYDROGRAPH (NO. 1)

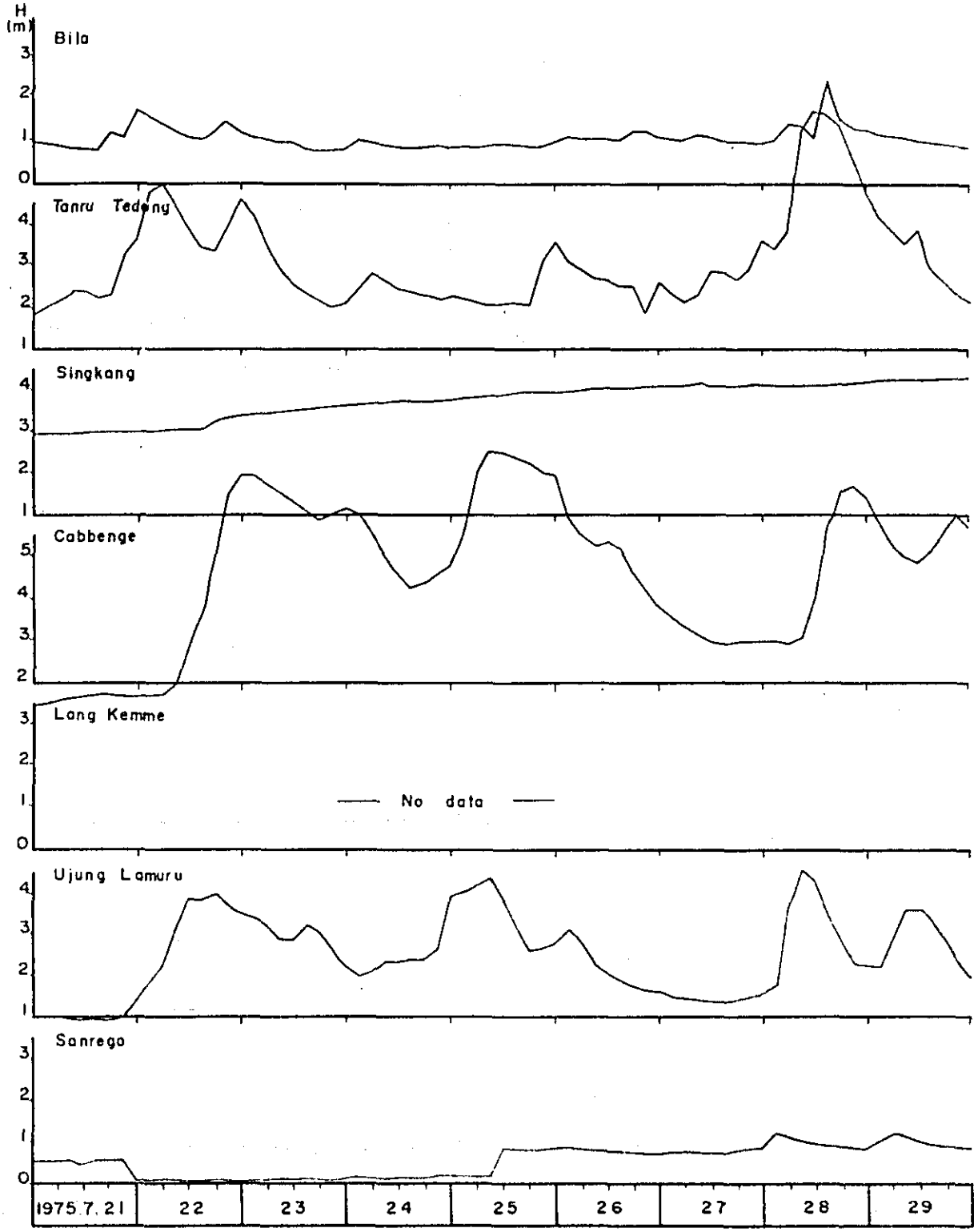


Fig. 4-2 MAIN FLOODS HYDROGRAPH (NO.2)

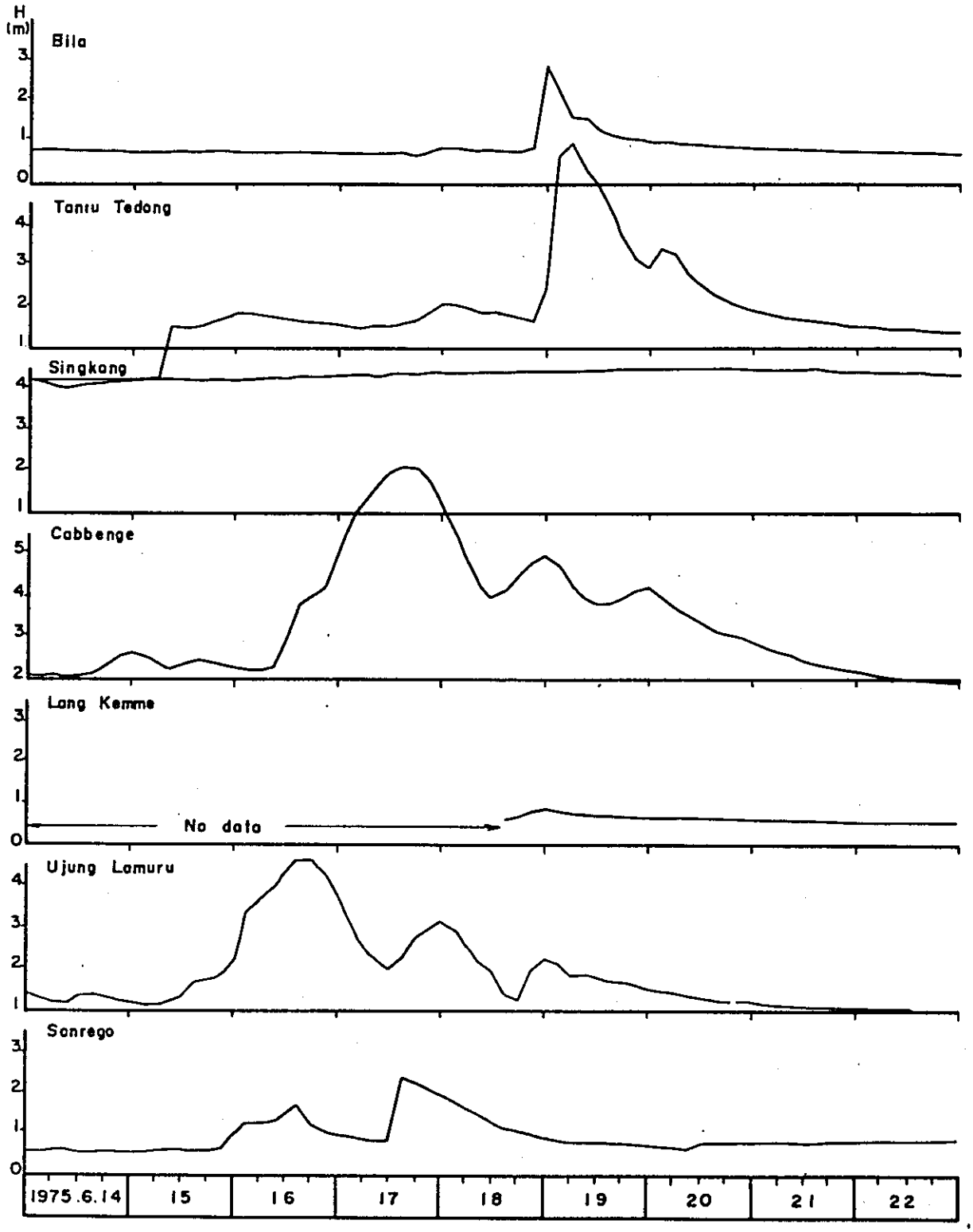


Fig. 4-3 MAIN FLOODS HYDROGRAPH (NO. 3)

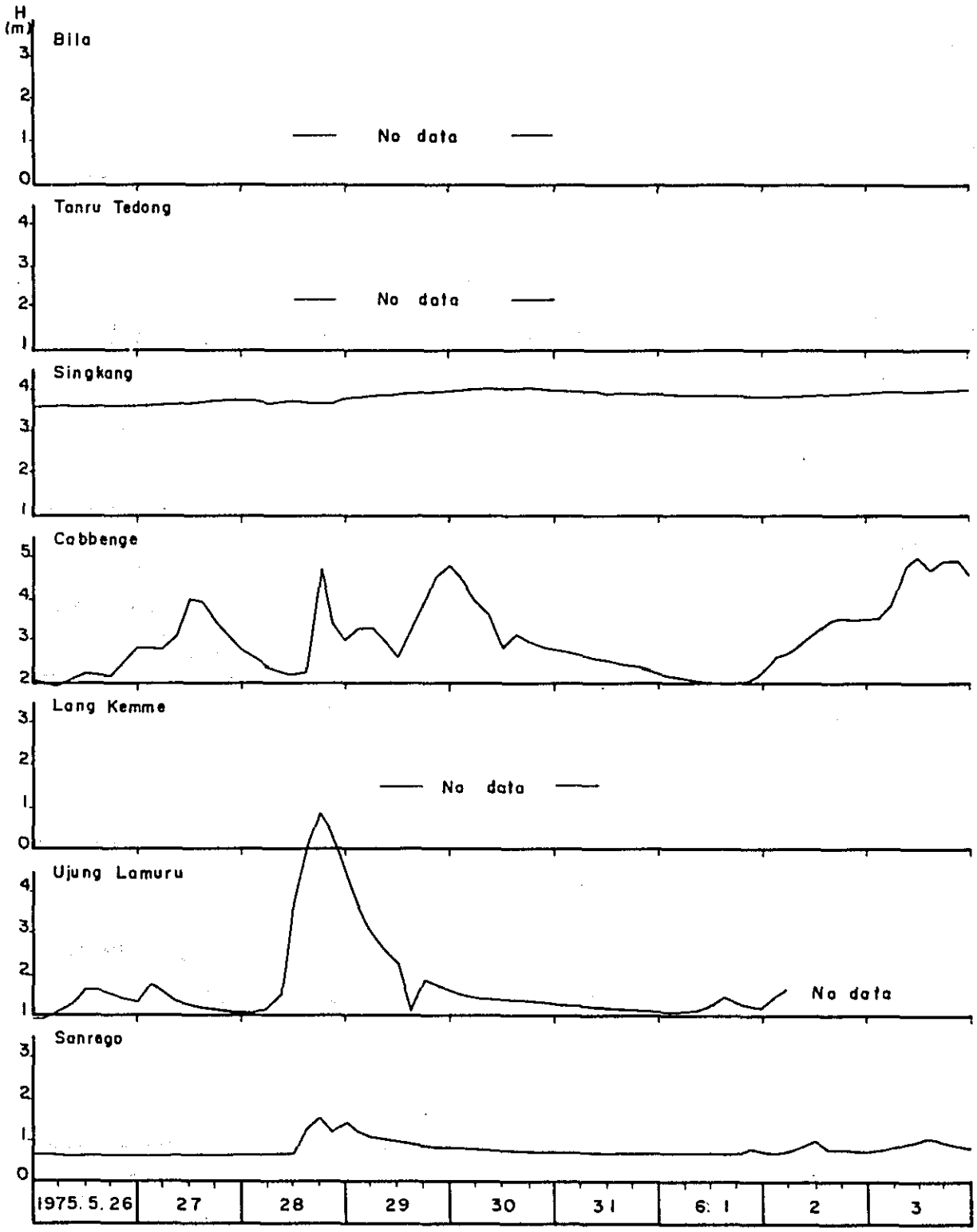


Fig. 4-4 MAIN FLOODS HYDROGRAPH (NO. 4)

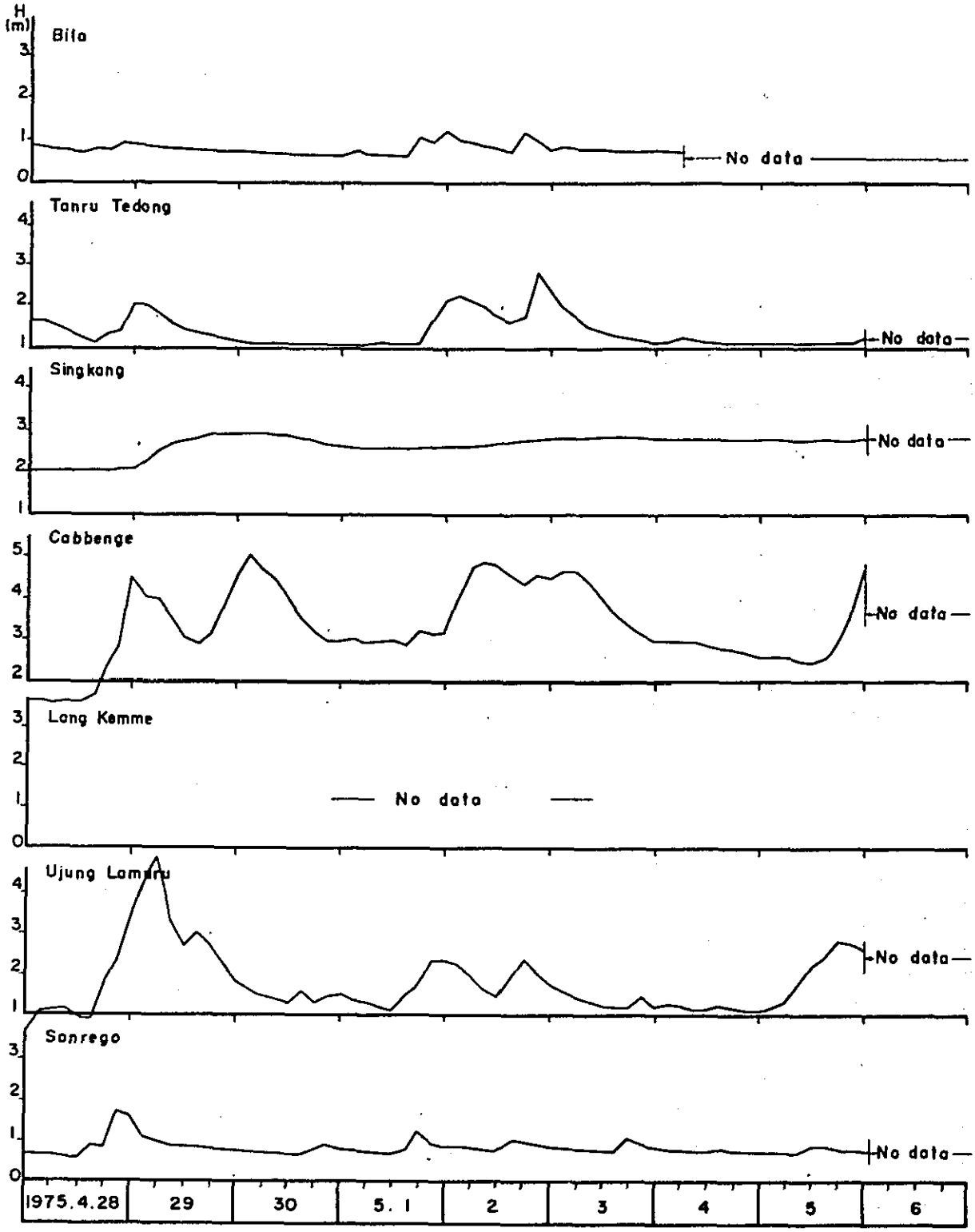


Fig. 4-5 MAIN FLOODS HYDROGRAPH (NO. 5)

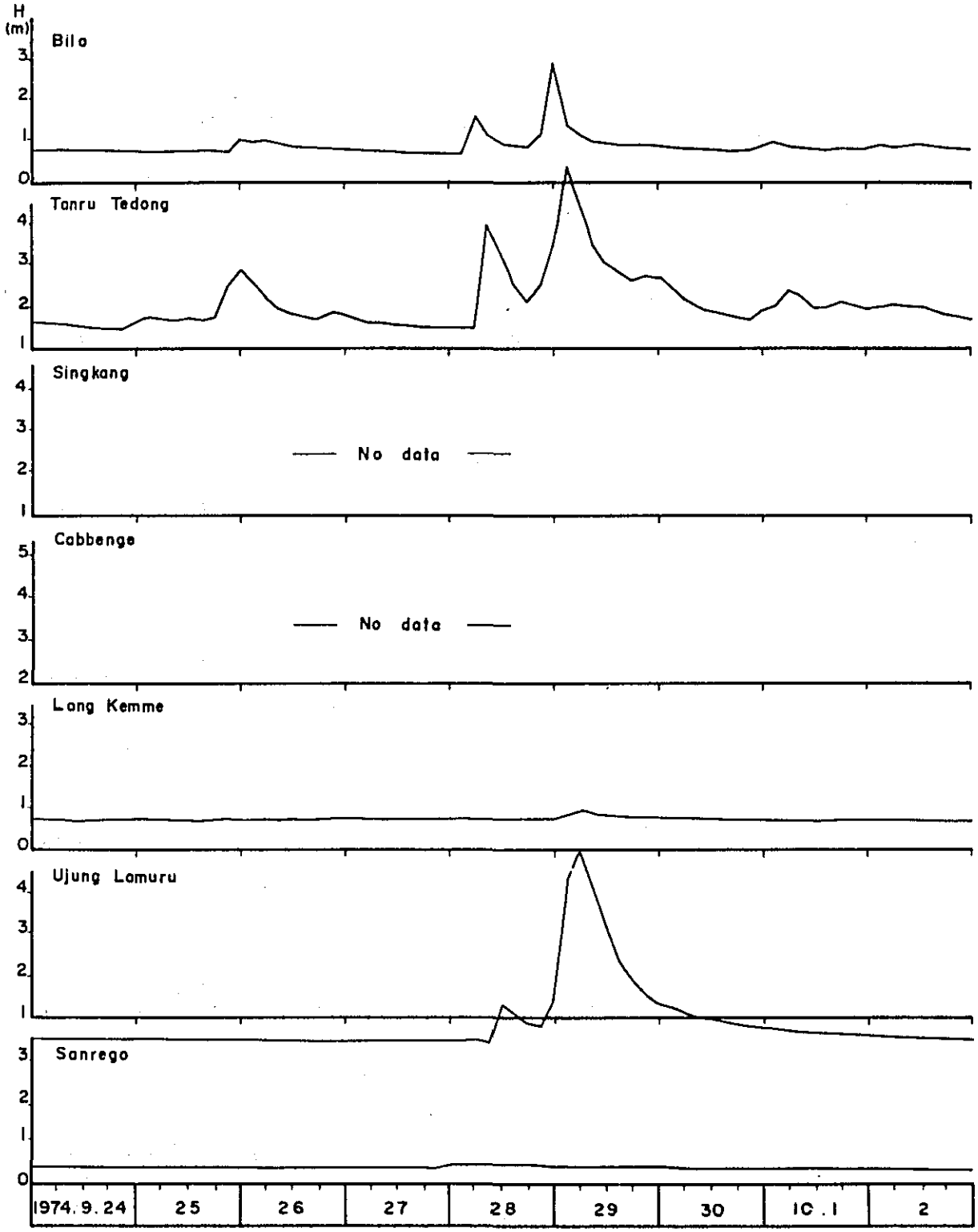


Fig. 4-6 MAIN FLOODS HYDROGRAPH (NO 6)

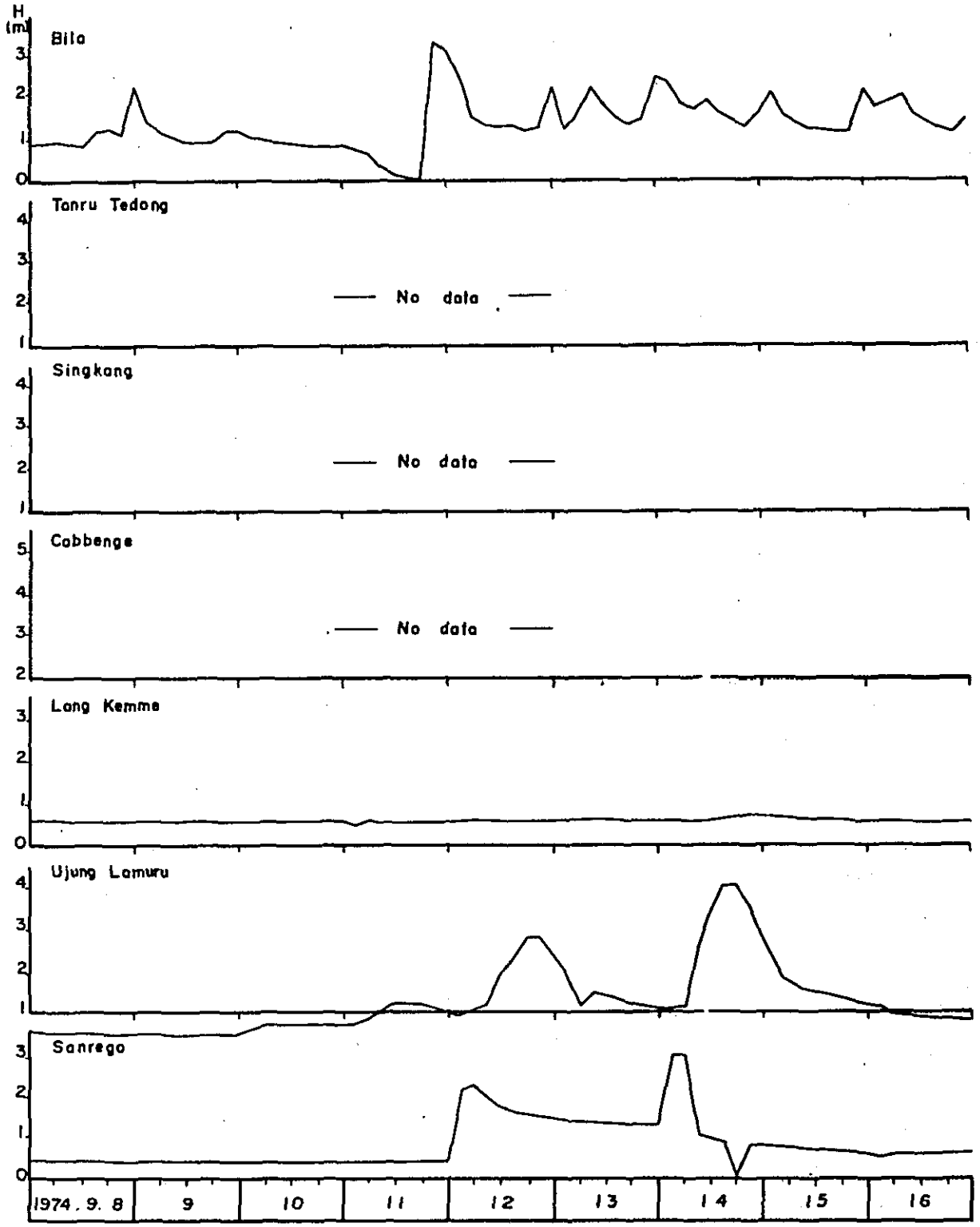


Fig. 4-7 MAIN FLOODS HYDROGRAPH (NO. 7)

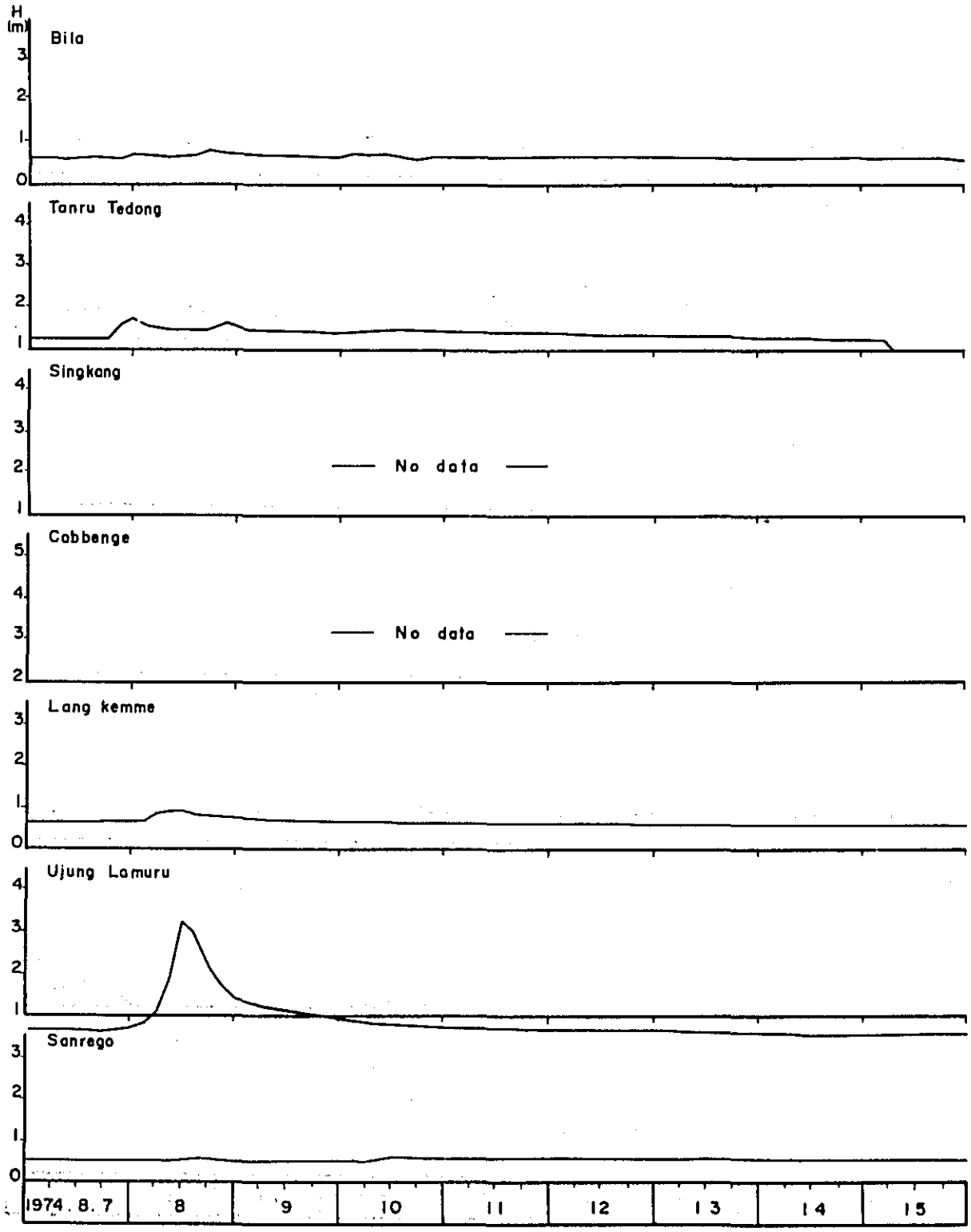


Fig. 4-8 MAIN FLOODS HYDROGRAPH (NO.8)

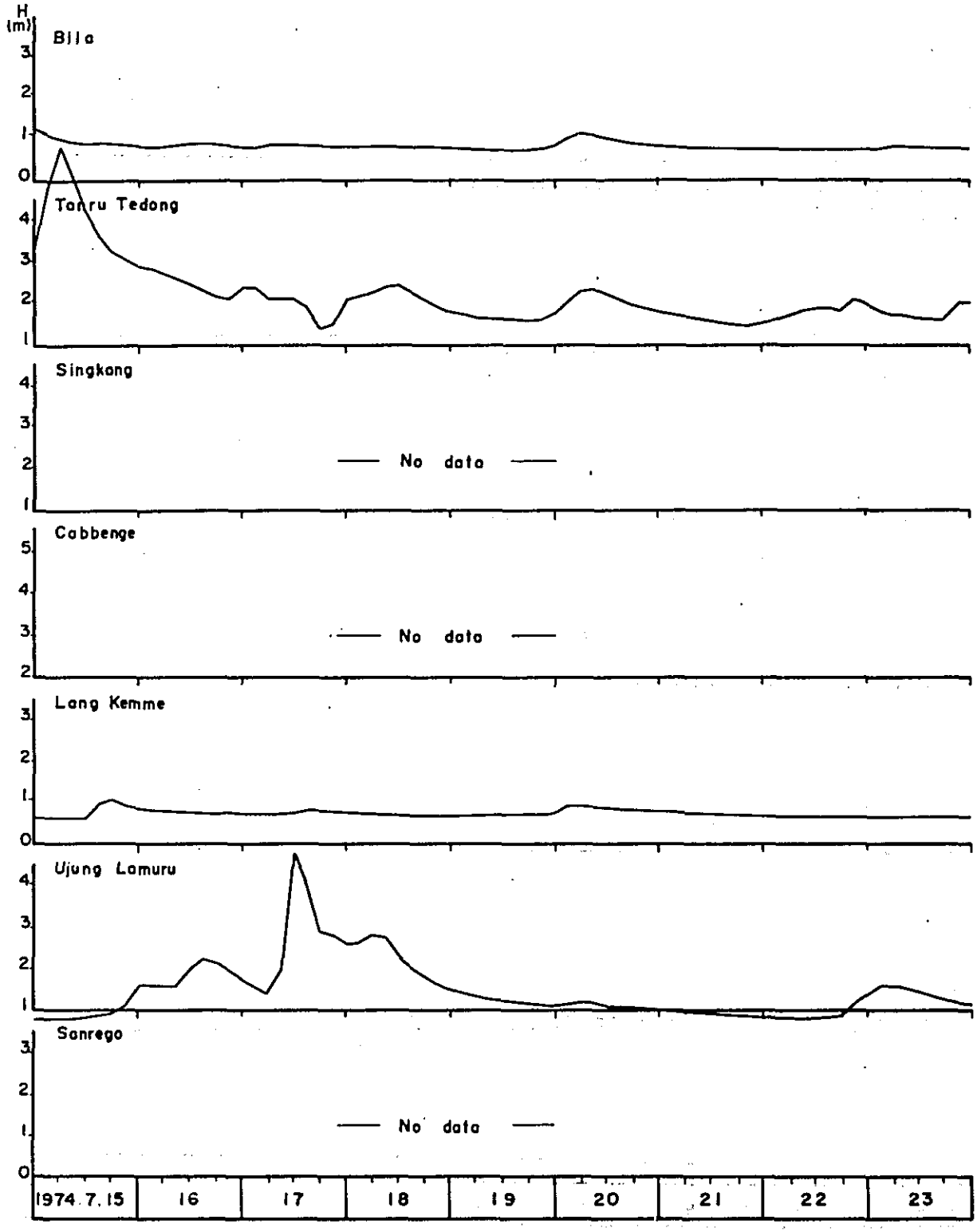


Fig. 4-9 MAIN FLOODS HYDROGRAPH (NO.9)

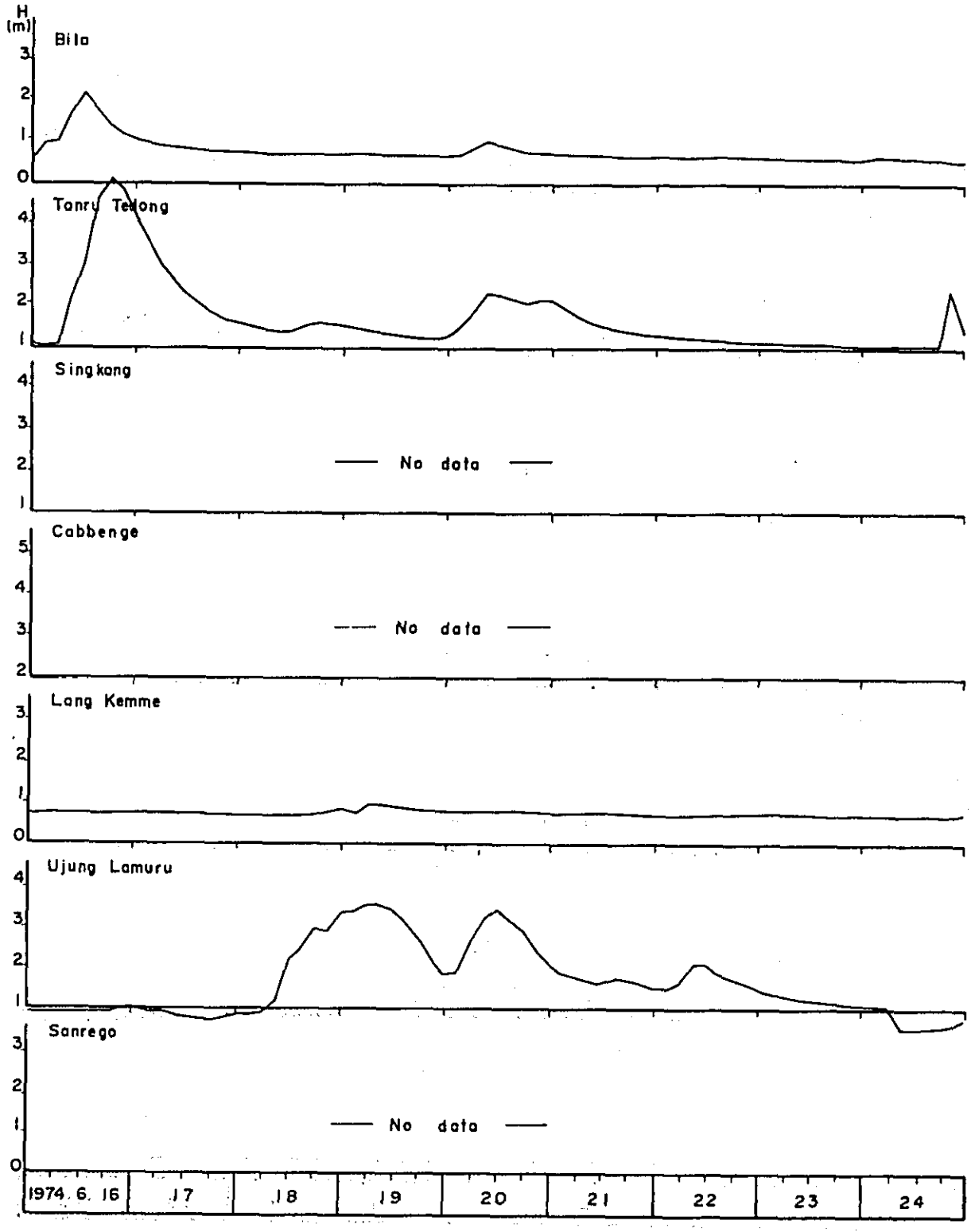


Fig. 4-10 MAIN FLOODS HYDROGRAPH (NO.10)

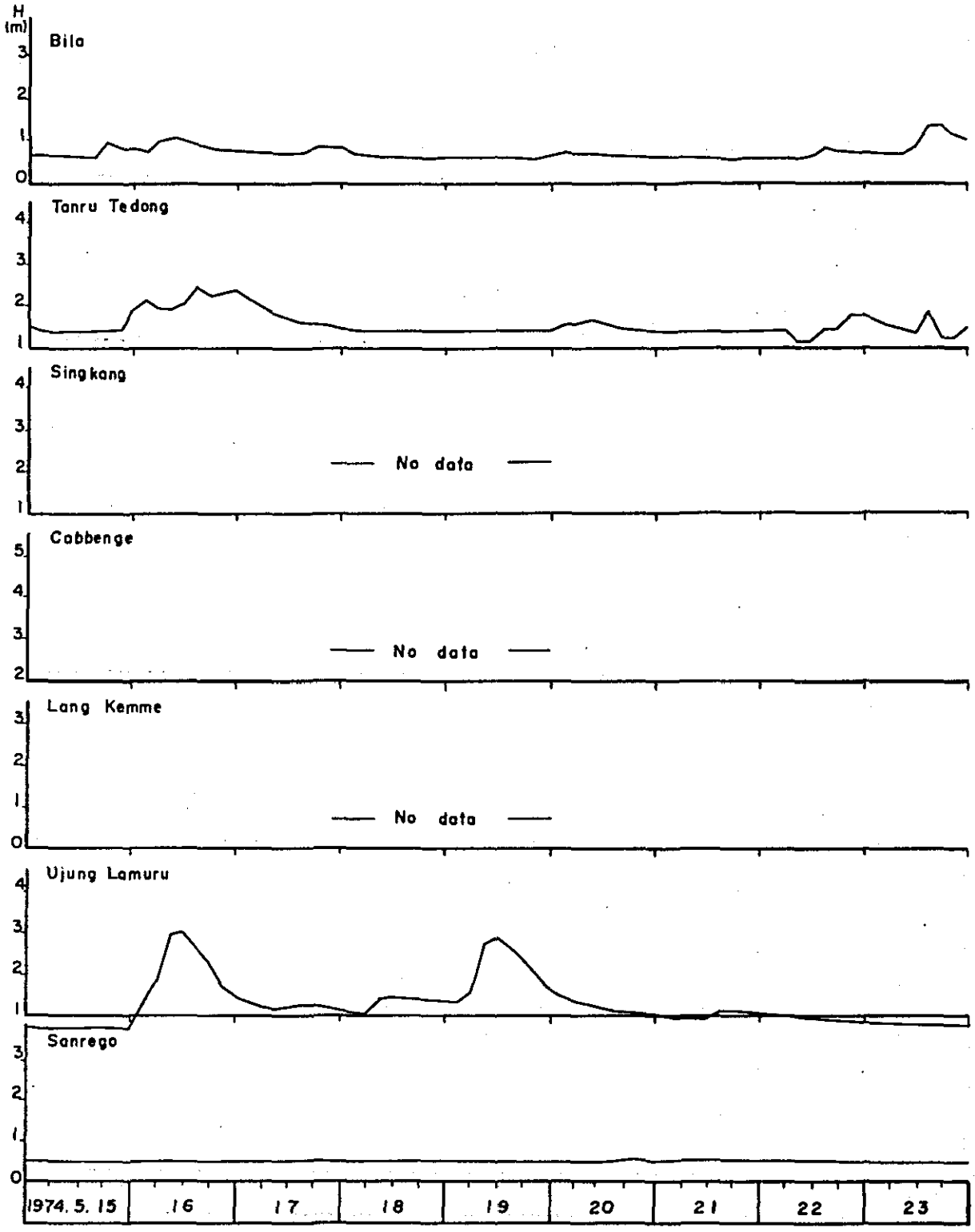


Fig. 4-11 MAIN FLOODS HYDROGRAPH (NO.11)

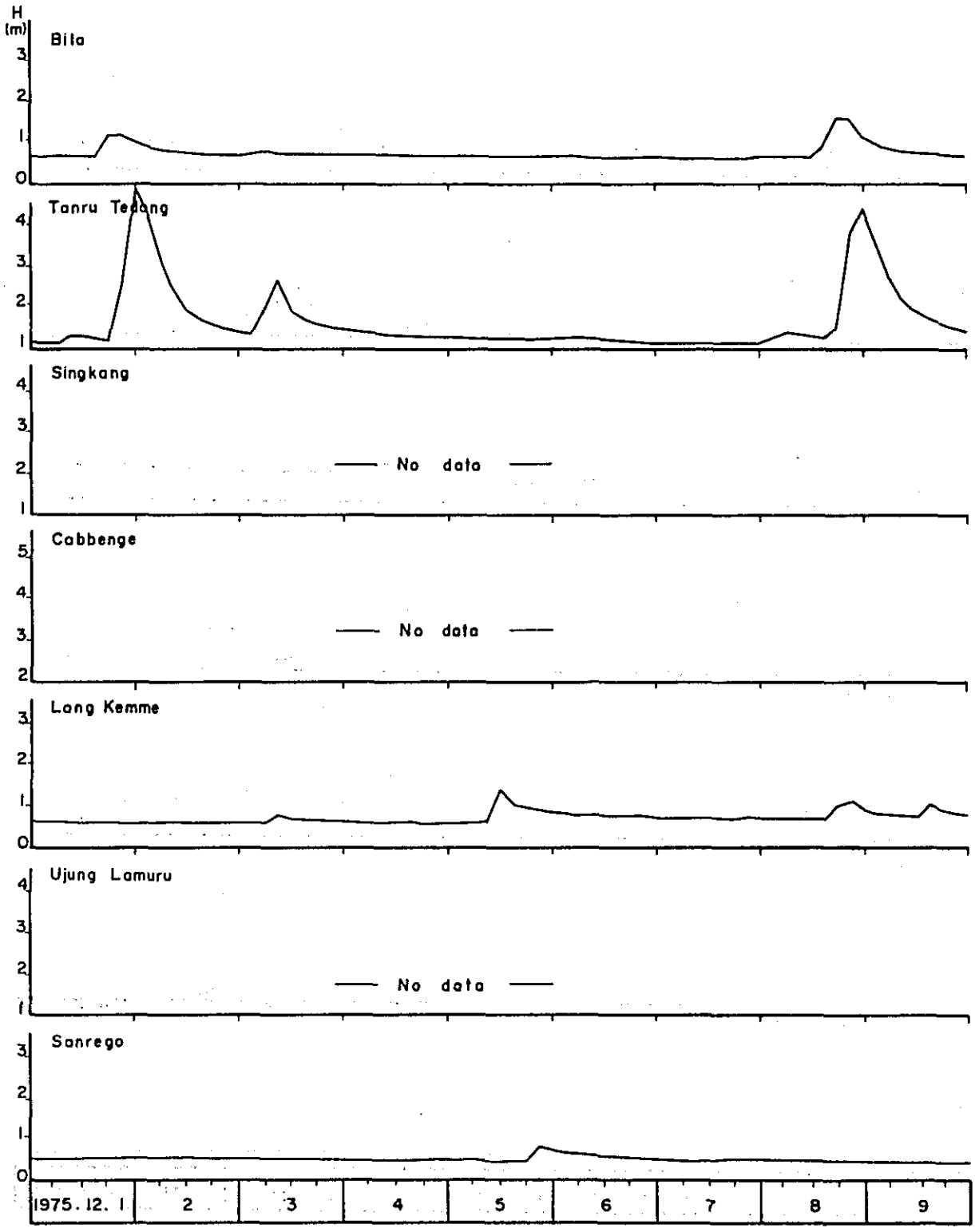


Fig. 4-12 MAIN FLOODS HYDROGRAPH (NO.12)

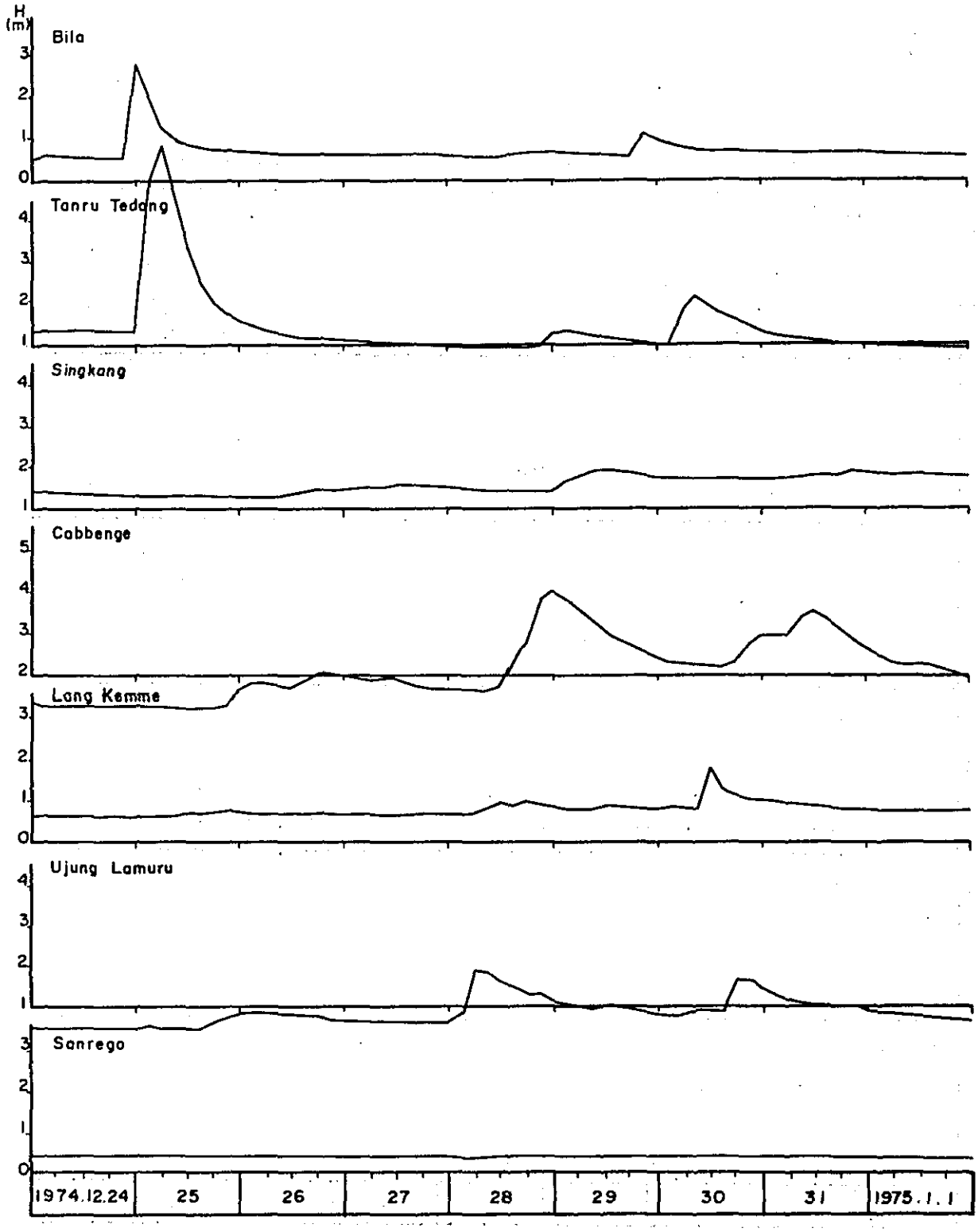


Fig. 4-13 MAIN FLOODS HYDROGRAPH (NO.13)

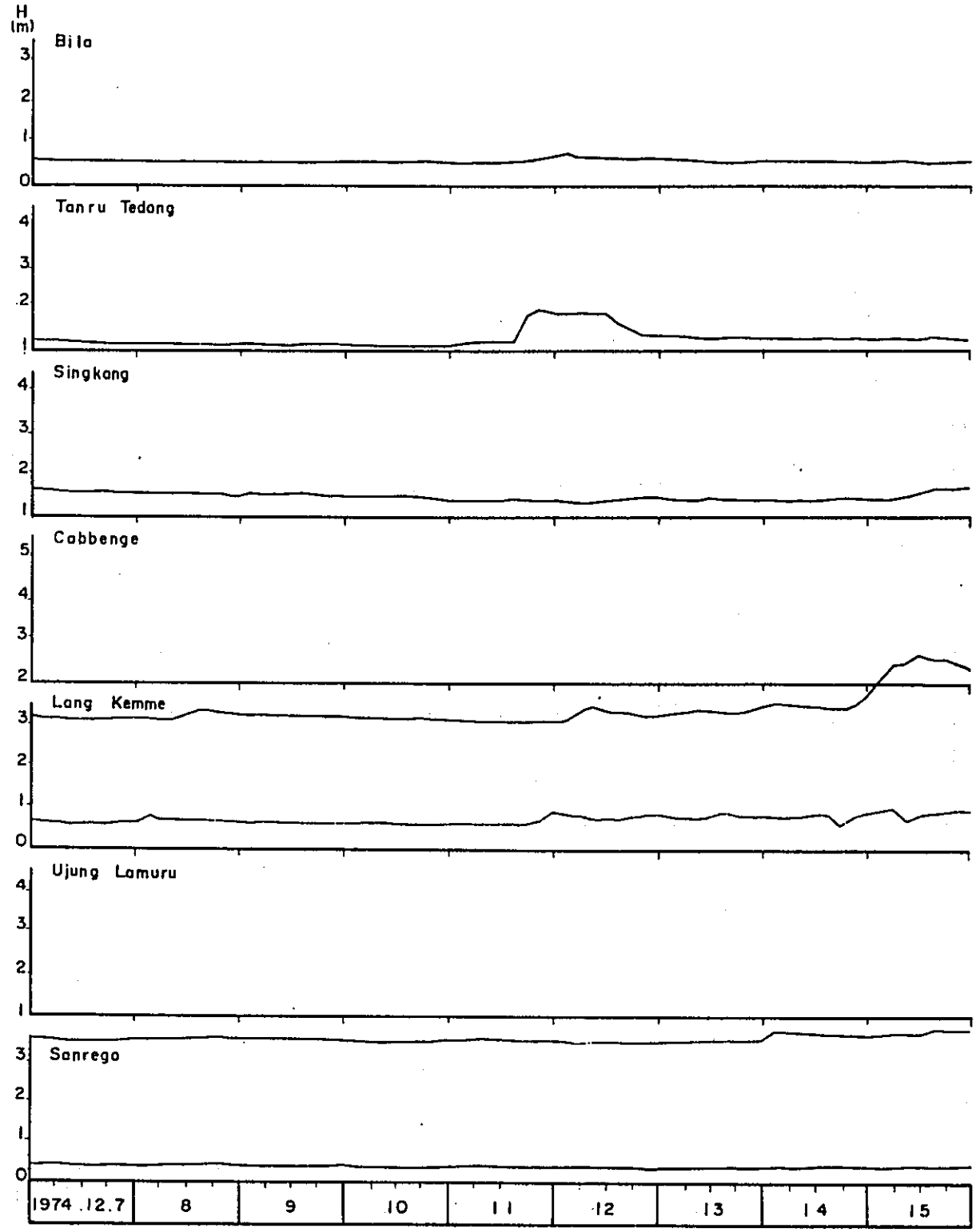


Fig. 4-14 MAIN FLOODS HYDROGRAPH (NO. 14)

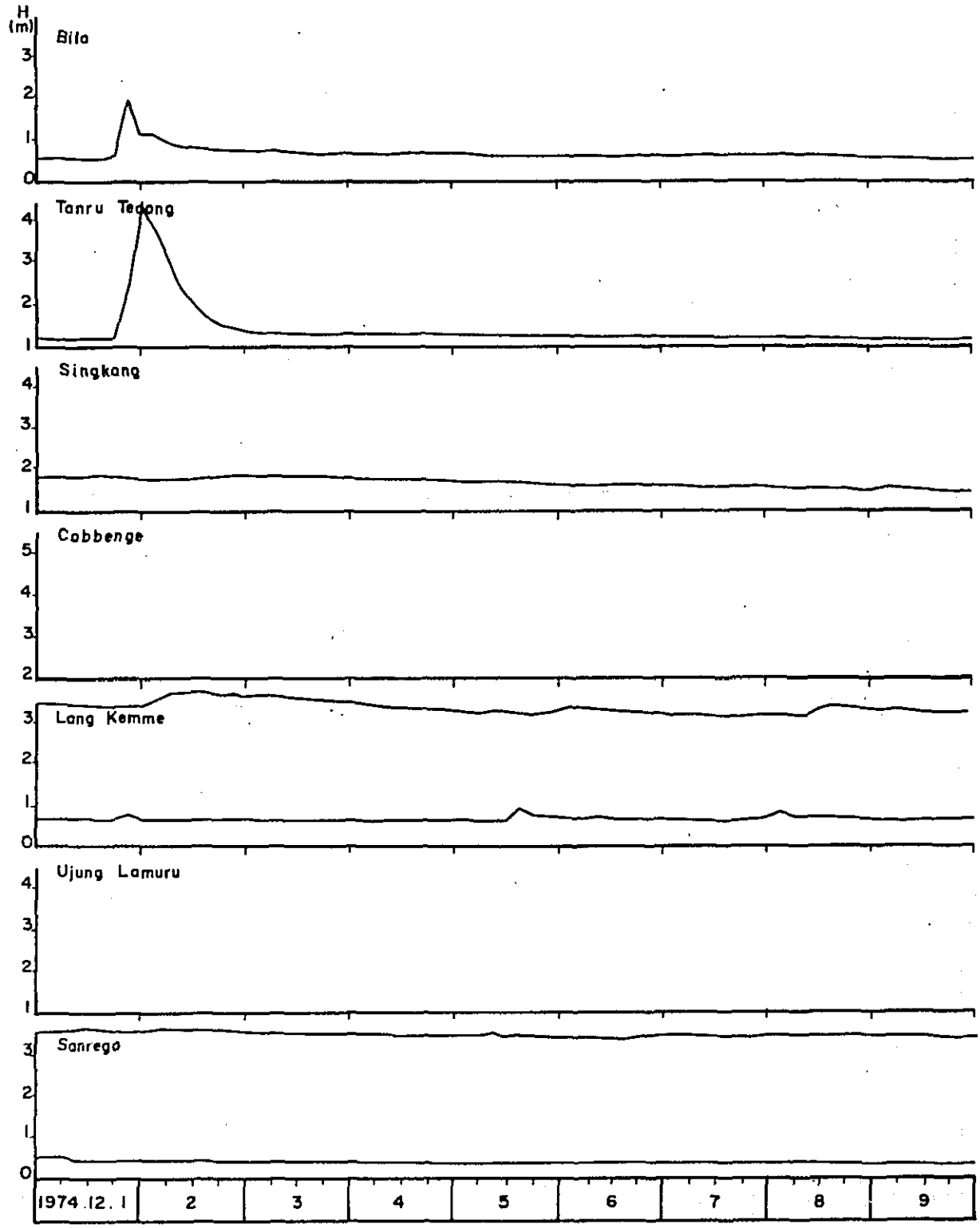


Fig. 4-15 MAIN FLOODS HYROGRAPH (NO.15)

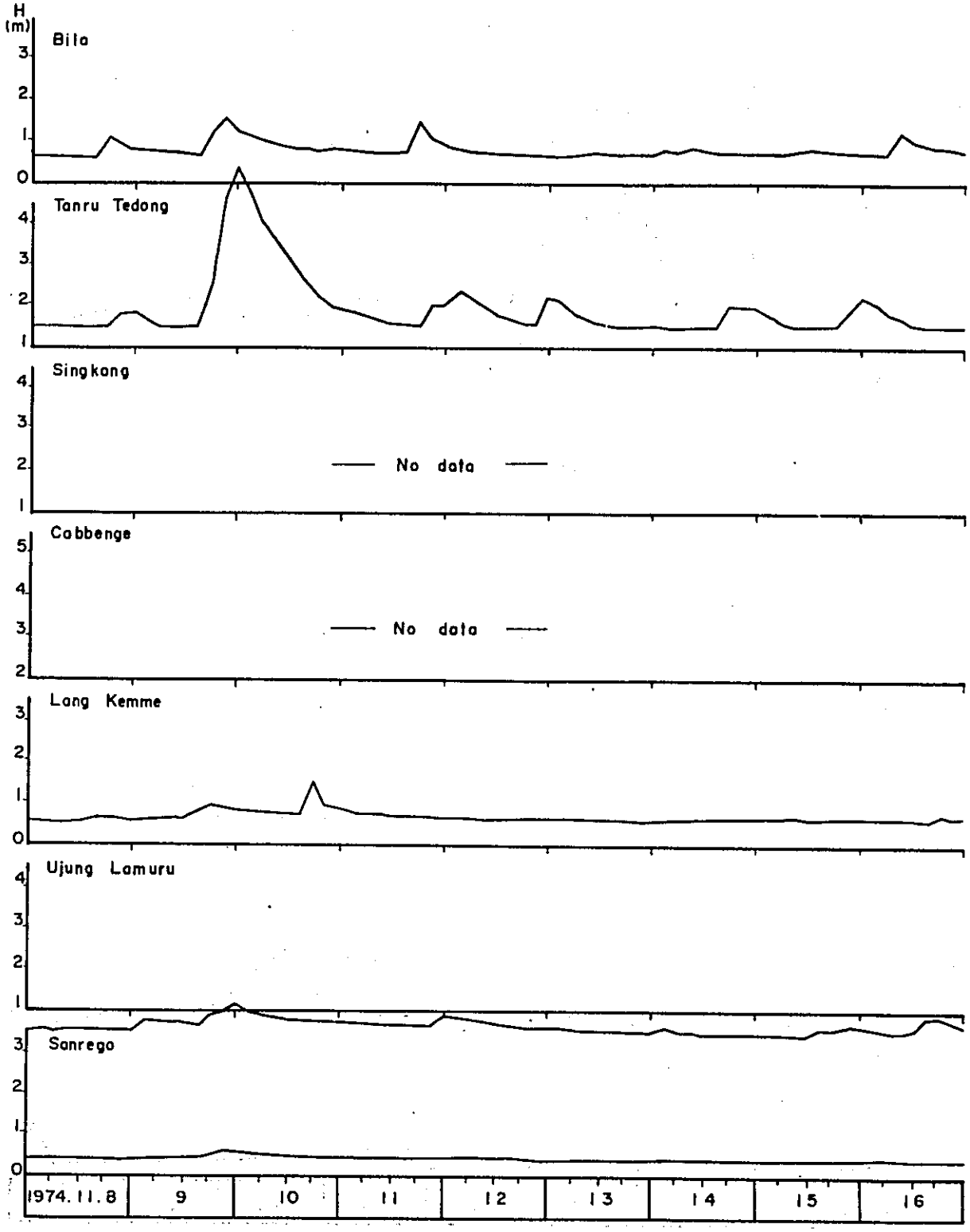


Fig. 4-16 MAIN FLOODS HYDROGRAPH (NO.16)

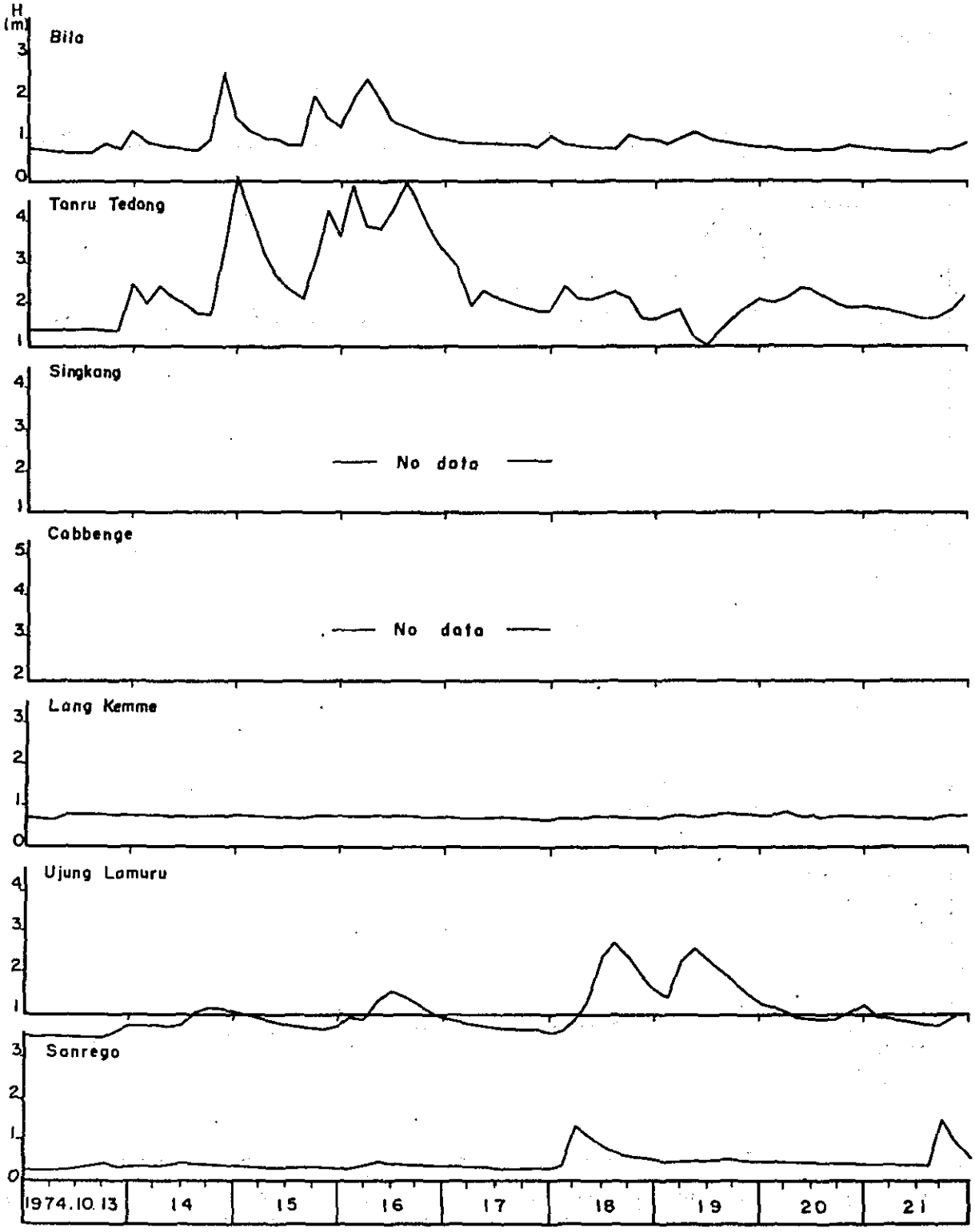


Fig. 4-17 MAIN FLOODS HYDROGRAPH (NO.17)

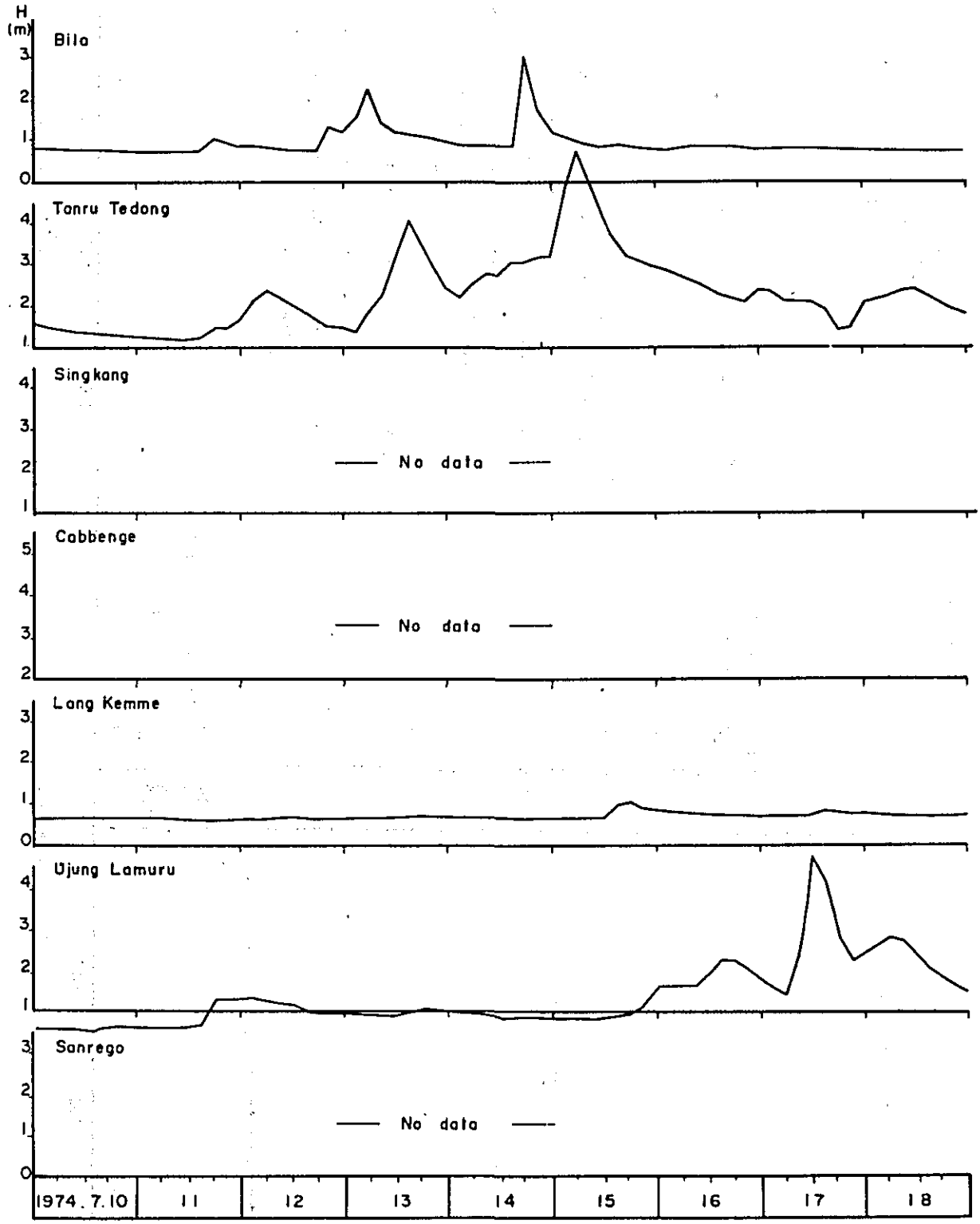


Fig. 5 FLOOD MARK SURVEY

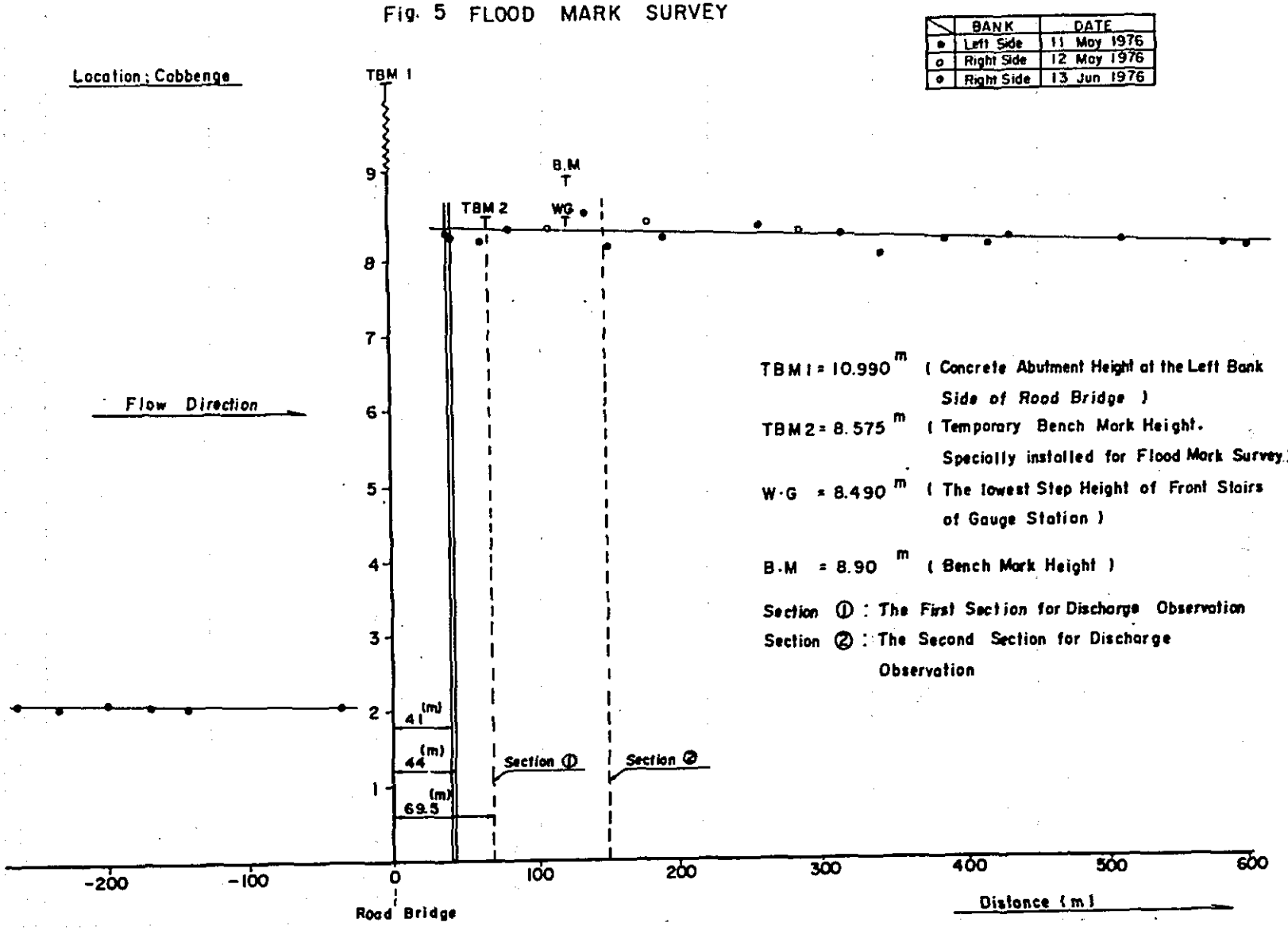


Table 8 FLOOD MARK SURVEY

Cabbenge (L)

Date	Point Number	Distance ΔX(m)	Distance X(m)	Foresight	Backsight	H Flood Mark(m)	Remarks
11. May 1976	No. 1	0.00	0.00		2.200	8.303	
	2	21.50	21.50	2.250		8.253	
	2'			1.928	1.495	8.575	TBM2(bridge)
	3	19.80	41.30	1.650	1.573	8.420	
	4	52.80	94.10	1.348	1.195	8.645	
	5	15.00	109.10	1.652		8.188	
	6	38.60	147.70	1.545	1.555	8.295	
	7	67.60	215.30	1.295	1.325	8.555	
	8	57.50	272.80	1.432	1.362	8.448	
	9	27.80	300.60	1.545		8.265	
	10	45.00	345.60	1.465	1.540	8.345	
	11	30.60	376.20	1.665		8.220	
	12	14.60	390.8	1.530		8.355	
	13	79.20	470.00	1.570	1.320	8.315	
	14	71.30	541.30	1.380		8.255	
	15	12.50	553.8	1.415	1.455	8.110	
	16	92.80	646.6	1.490		8.075	

(No.1; 44(m) from Bridge)

Cabbenge (R)

Date	Point Number	Distance ΔX(m)	Distance X(m)	Foresight	Backsight	H Flood Mark(m)	Remarks
12. May 1976	No. 1	0.00	0.00		1.590	8.370	
	1'			1.085	1.245	8.875	T.P
	2	72.90	72.90	1.705	1.735	8.415	
	2'			1.662	1.580	8.488	T.P
	2*			1.578		8.490	W.G (step of W.G)
	3	68.00	140.90	1.575	1.545	8.493	
	3'			0.525	0.525	9.513	T.P
	4	106.00	246.90	1.520		8.518	

(No.1; 41(m) from Bridge)

Cabbenge (R)

Date	Point Number	Distance ΔX(m)	Distance X(m)	Foresight	Backsight	H Flood Mark(m)	Remarks
13Jun. 1976	No. 1	0.00	0.00		0.692	8.575	T.B.M2
	1'			0.907	0.430	8.360	T.P1
	1*			4.400	0.375	4.390	T.P2
	2	34.50	34.50	2.700	2.420	2.065	
	3	107.70	142.20	2.410		2.075	
	4	25.50	167.70	2.395		2.090	
	5	29.20	196.90	2.378		2.107	
	6	34.50	231.40	2.414		2.071	
	7	28.00	259.40	2.372		2.113	

Fig. 6 - 1 CROSS SECTION AT DISCHARGE OBSERVATION POINT

19 April 1976

Tanru Tedong

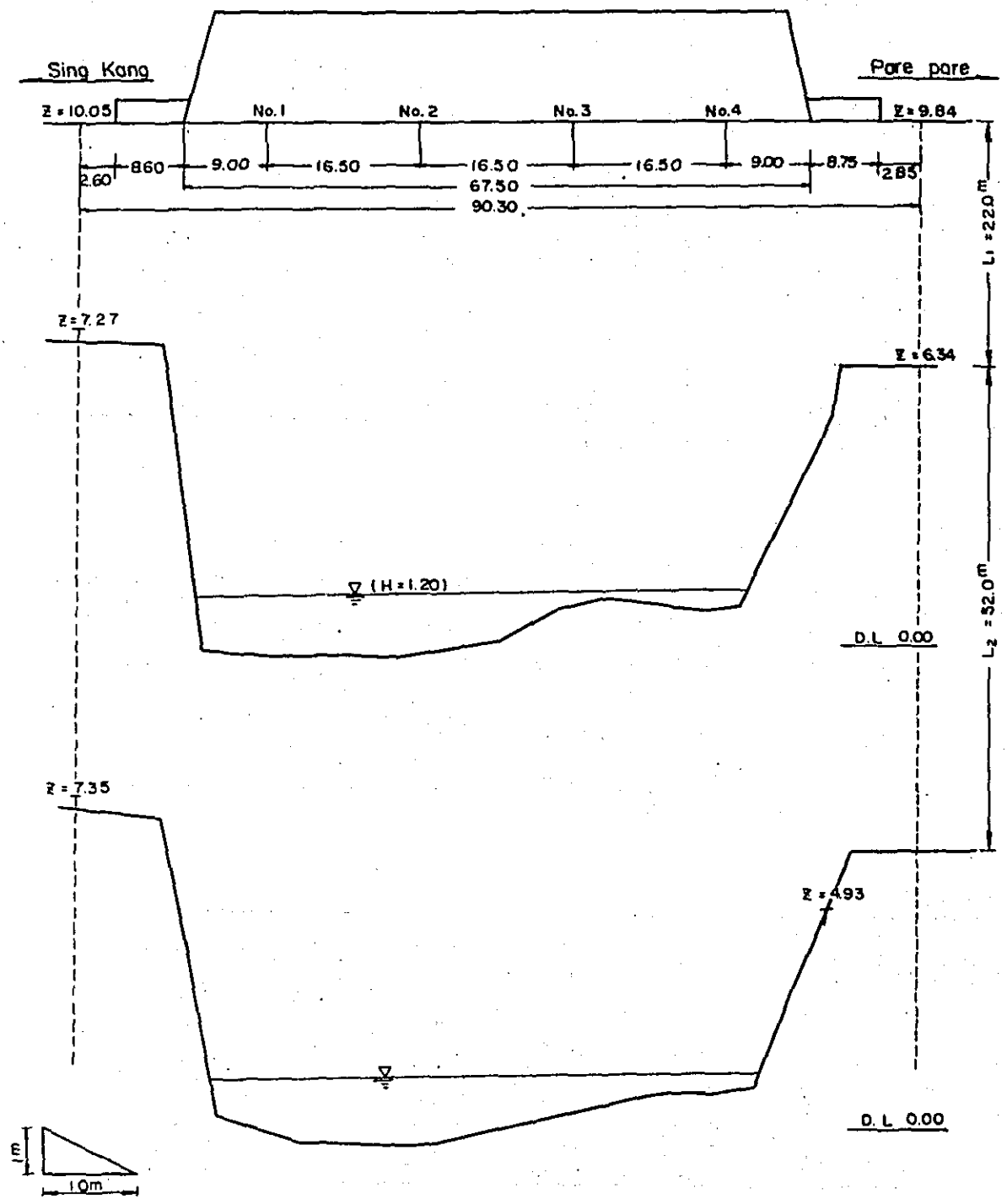


Fig. 6-2 CROSS SECTION AT DISCHARGE OBSERVATION POINT

Ujung Lamuru

23. April 1976

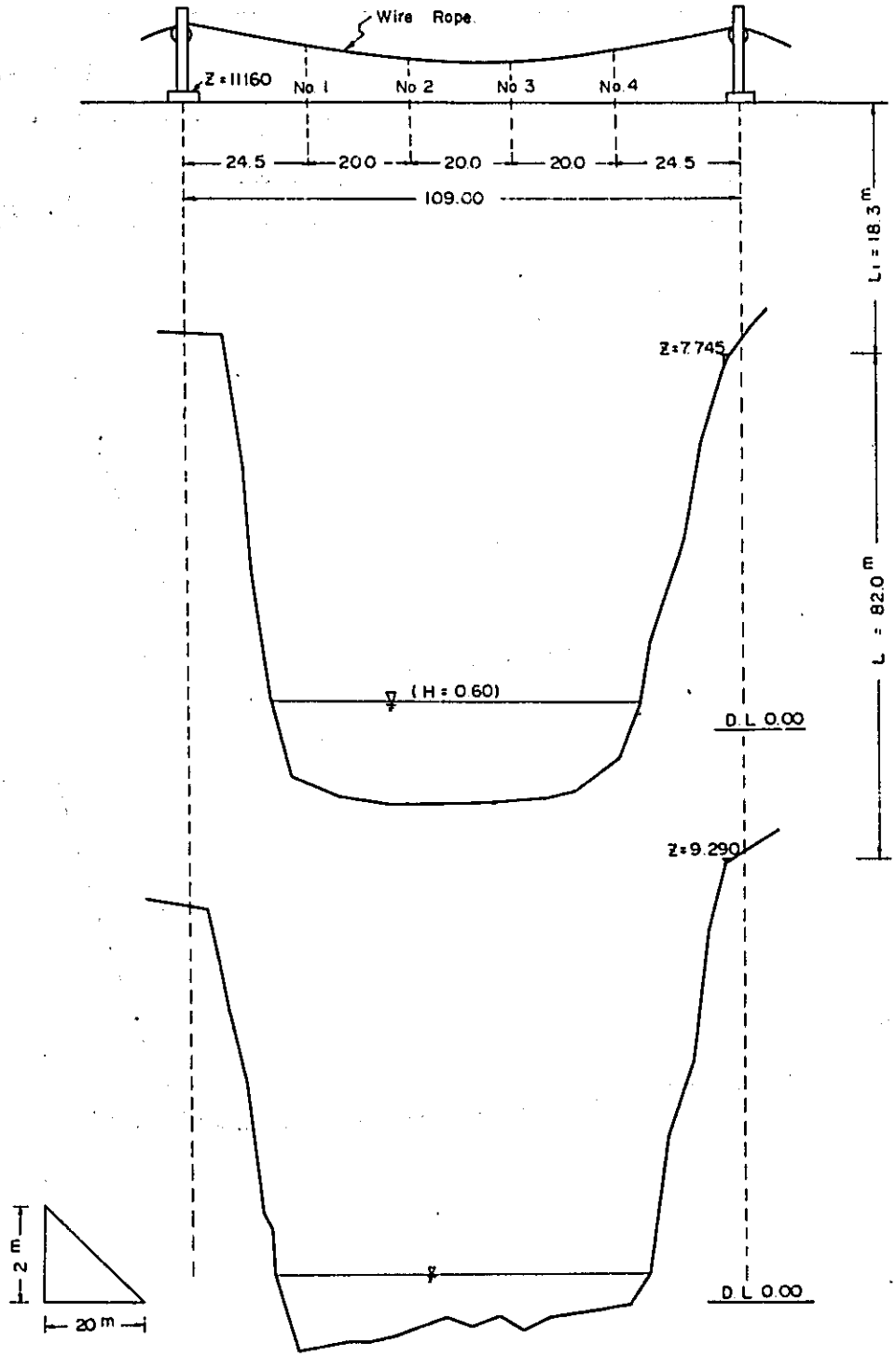


Fig. 6-3 CROSS SECTION AT DISCHARGE OBSERVATION POINT

Cabbenge

22. April 1976

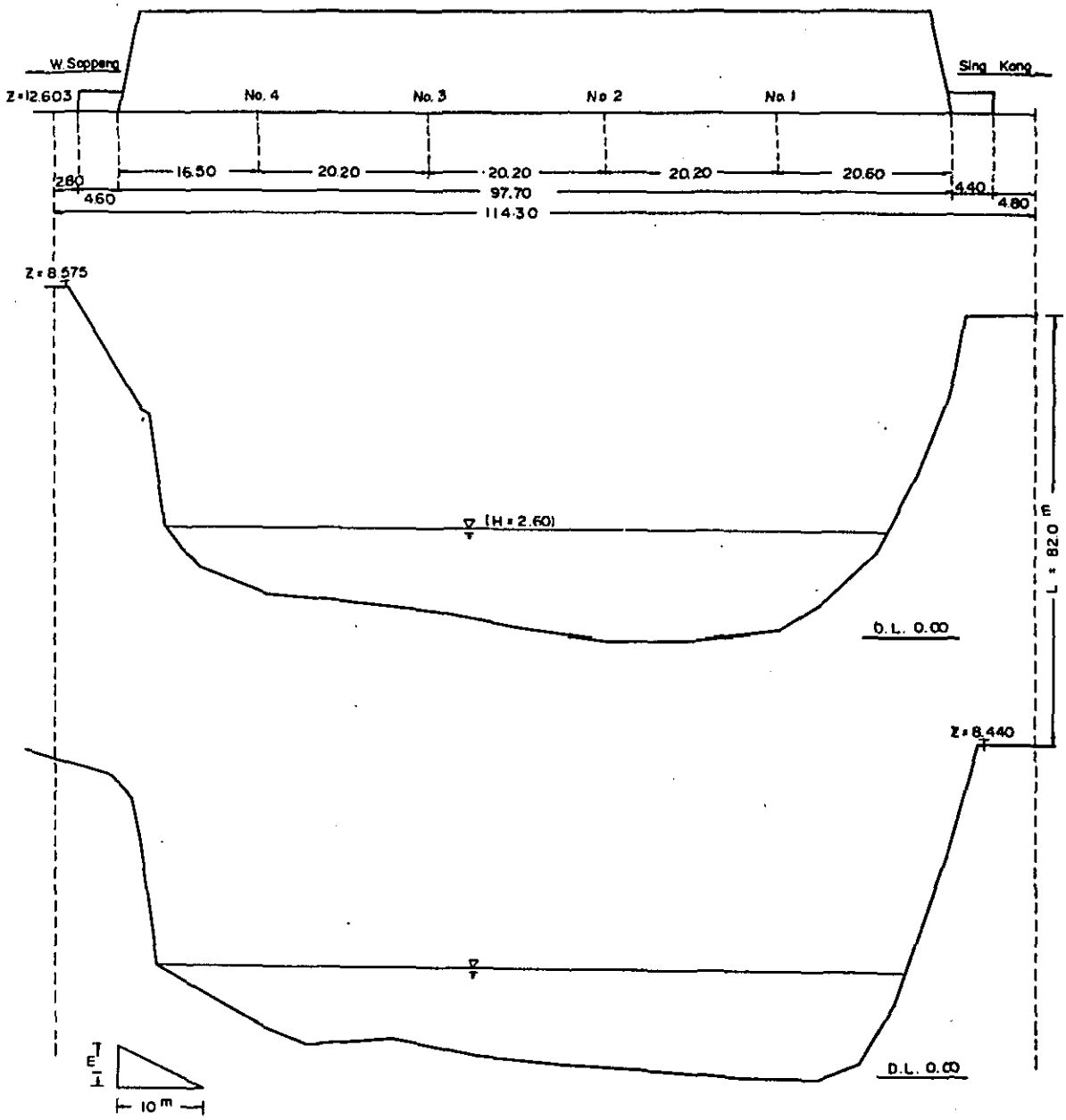


Fig. 6 - 4 CROSS SECTION AT DISCHARGE OBSERVATION POINT

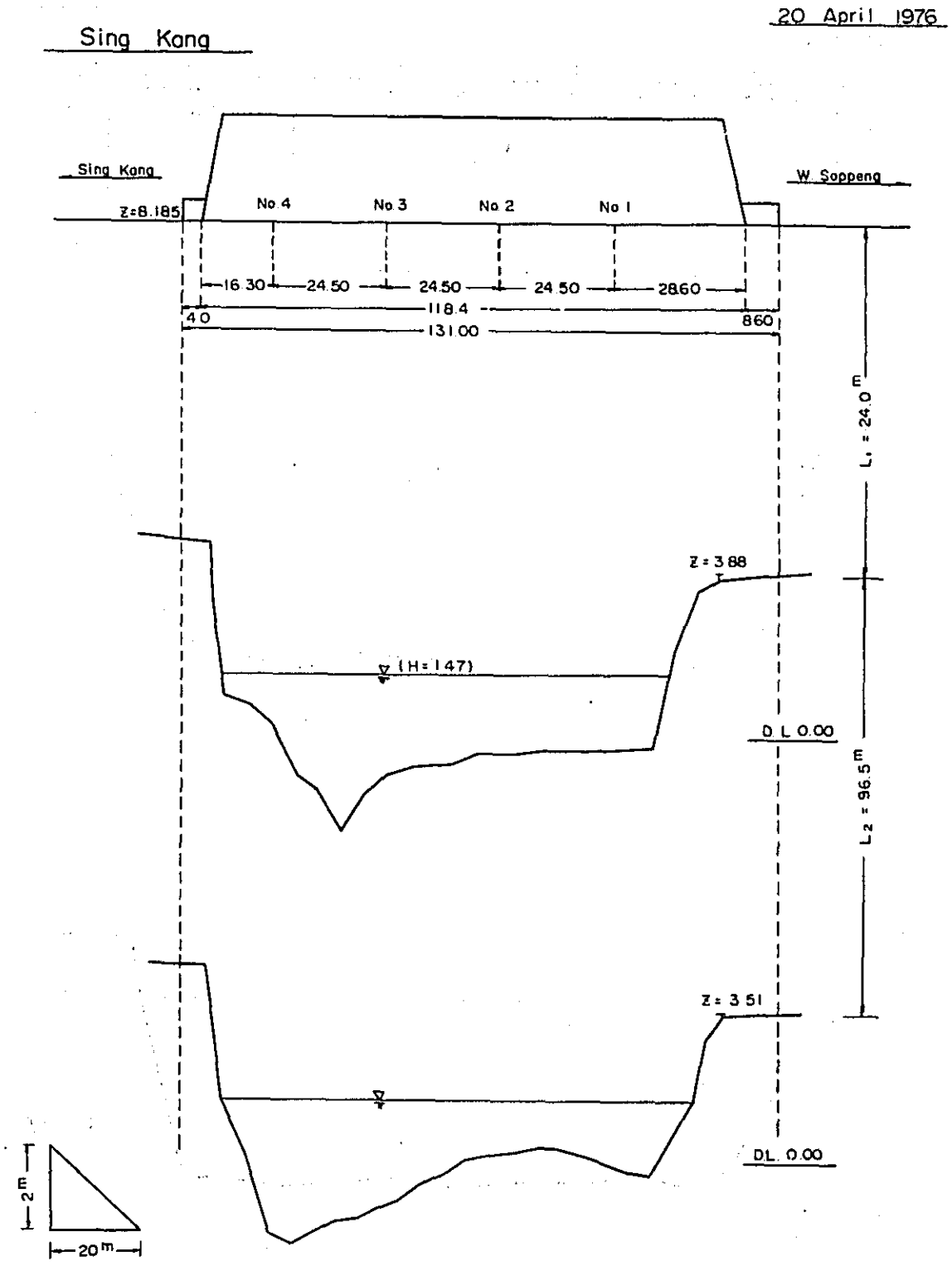


Fig. 6 - 5 CROSS SECTION AT DISCHARGE OBSERVATION POINT

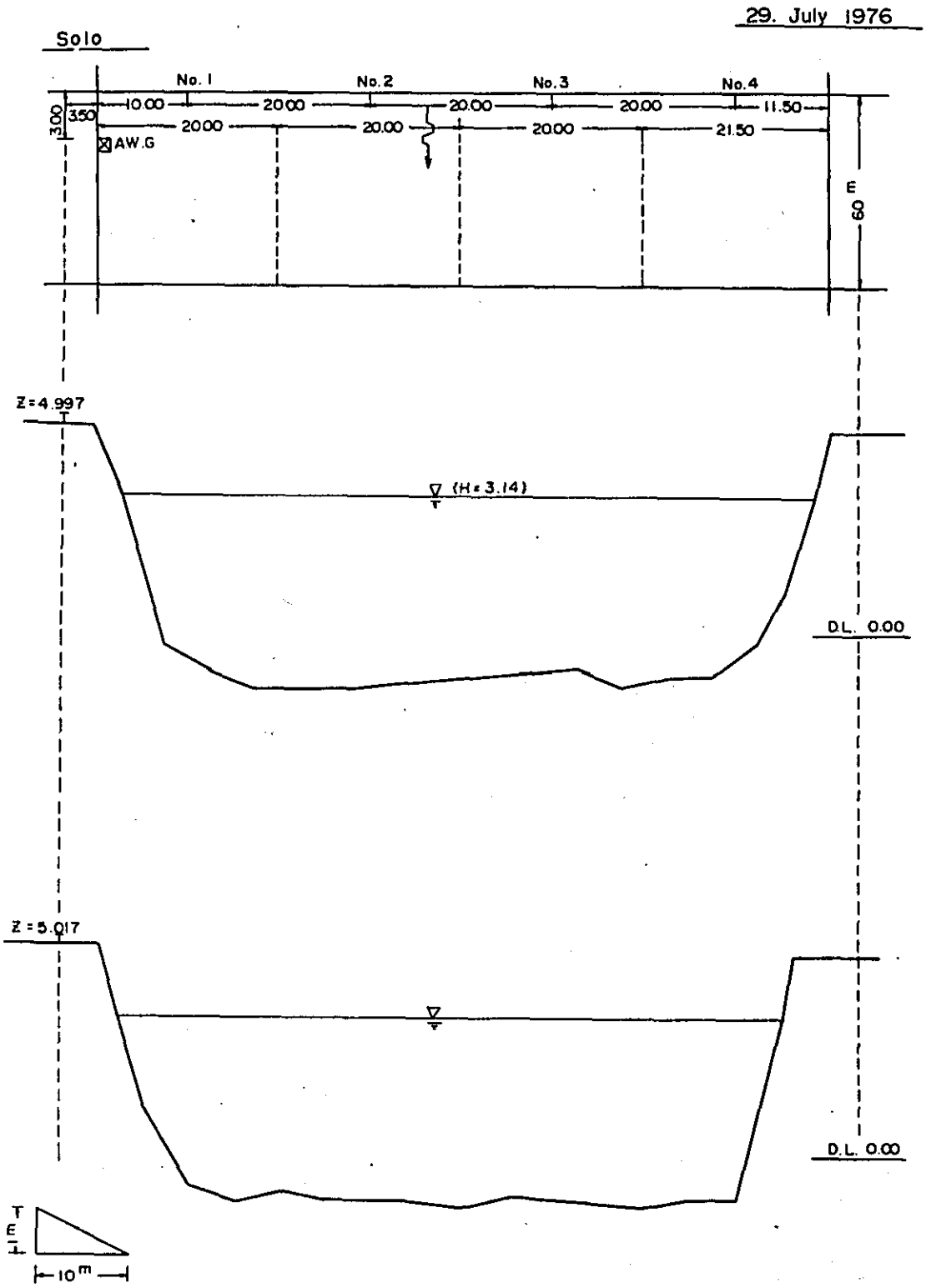
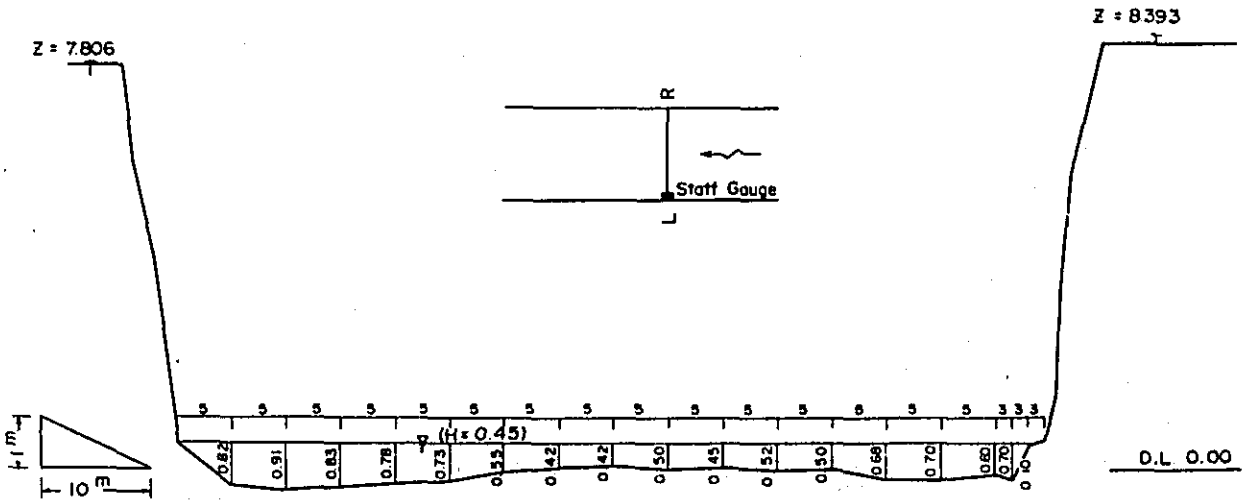


Fig. 6 - 6 CROSS SECTION AT DISCHARGE OBSERVATION POINT

26. July 1976

Lakibong



6. Aug. 1976

Bila

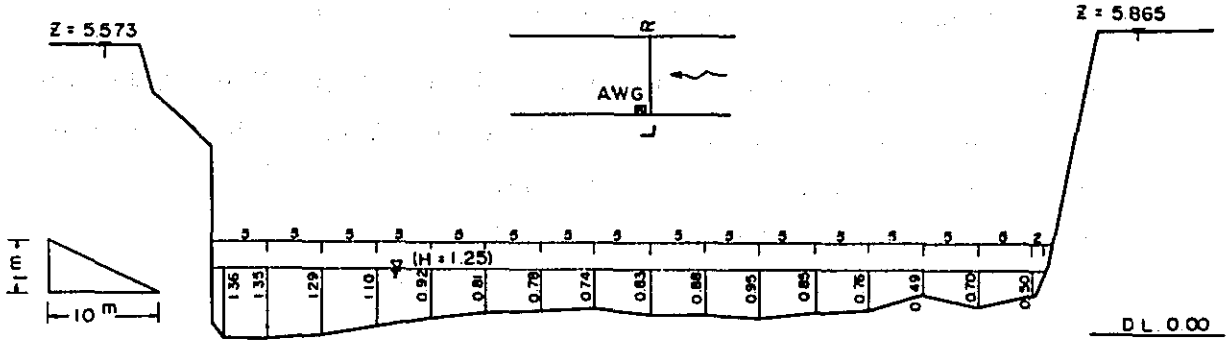
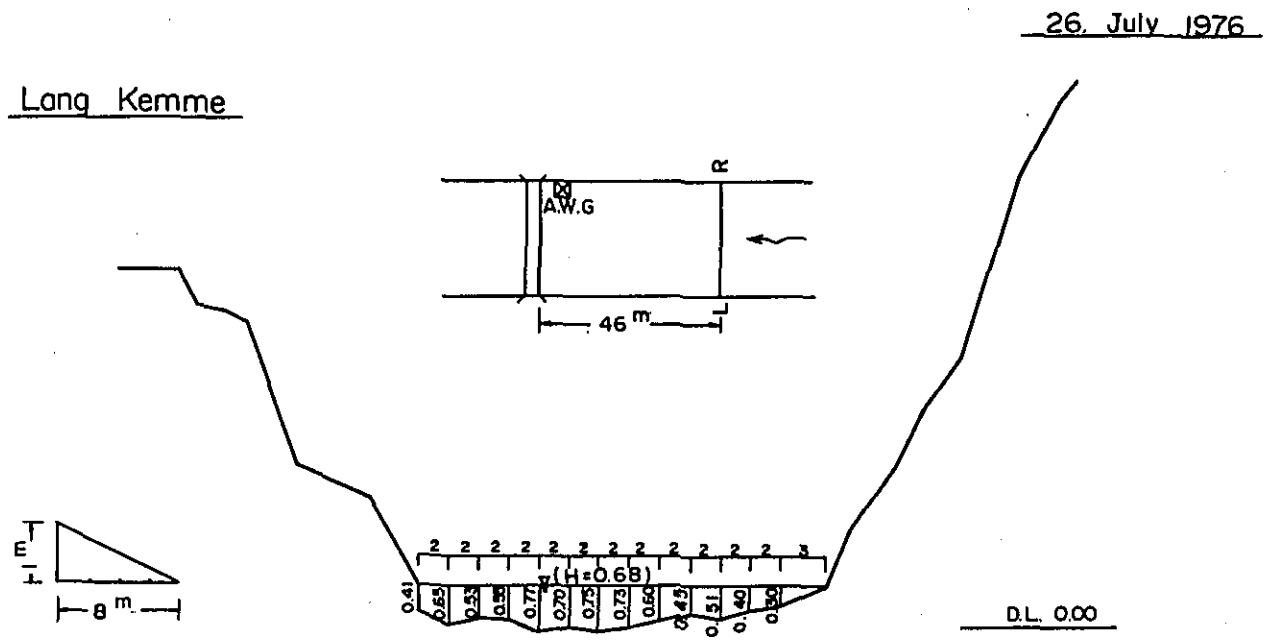


Fig. 6-7 CROSS SECTION AT DISCHARGE OBSERVATION POINT



* Accoding to the findings of our recent reconnaissance, an appropriate maintenance of the apparatus is recommended especially at Solo station, where the apparatus is almost out of order because of an excessive silted deposit.

* Read-off the staff gauges was found difficult at Tempe, Bajoe (Pallette) and Buru Cenrana because of rusted gauge. Especially at Buru Cenrana, the water-stage was often found far below point zero of the staff gauge.

  (cf. REFERENCE MATERIALS, Photograph No.5, No.6)

Fig. 7 RELATIONSHIP BETWEEN DROUGHT AND CORRECTIVE COEFFICIENT OF BAMBOO FLOAT

NO.	1	2	3	4	5
H (m)	H < 0.7	0.7 ~ 1.3	1.3 ~ 2.6	2.6 ~ 5.2	5.2 < H
D (m)	Surface Float	0.5	1.0	2.0	4.0
α	0.85	0.88	0.91	0.94	0.96

H: Water Depth, D : Drought of Float, α : Coefficient

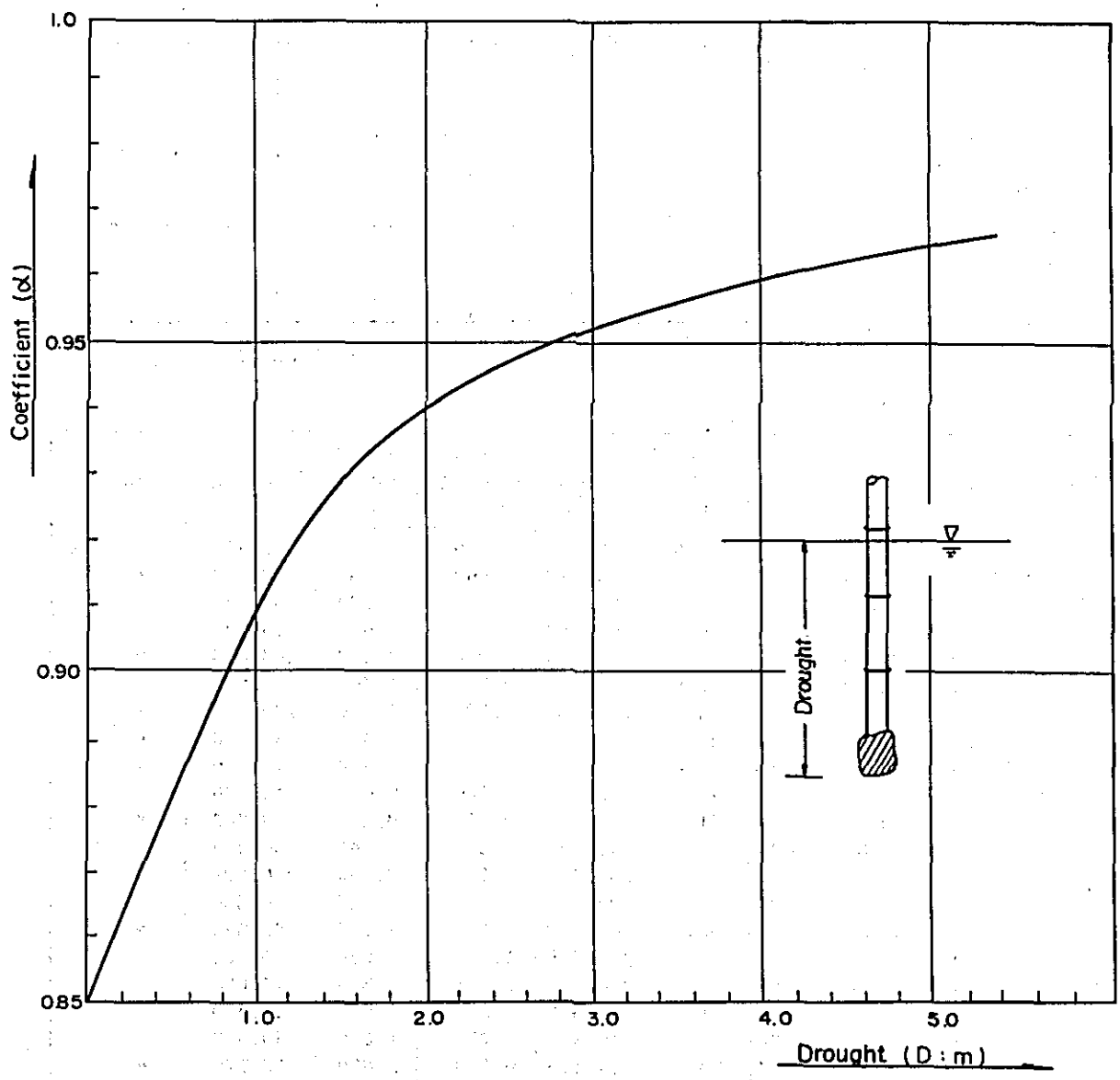
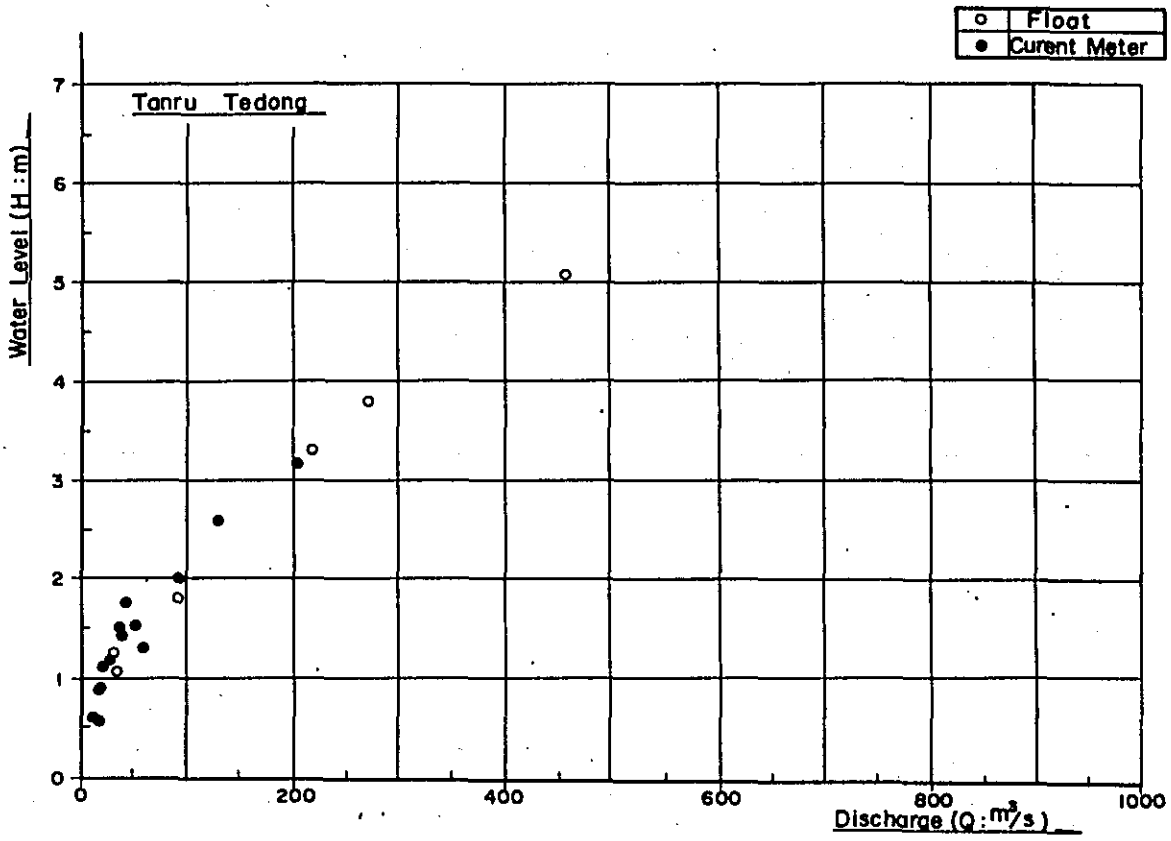
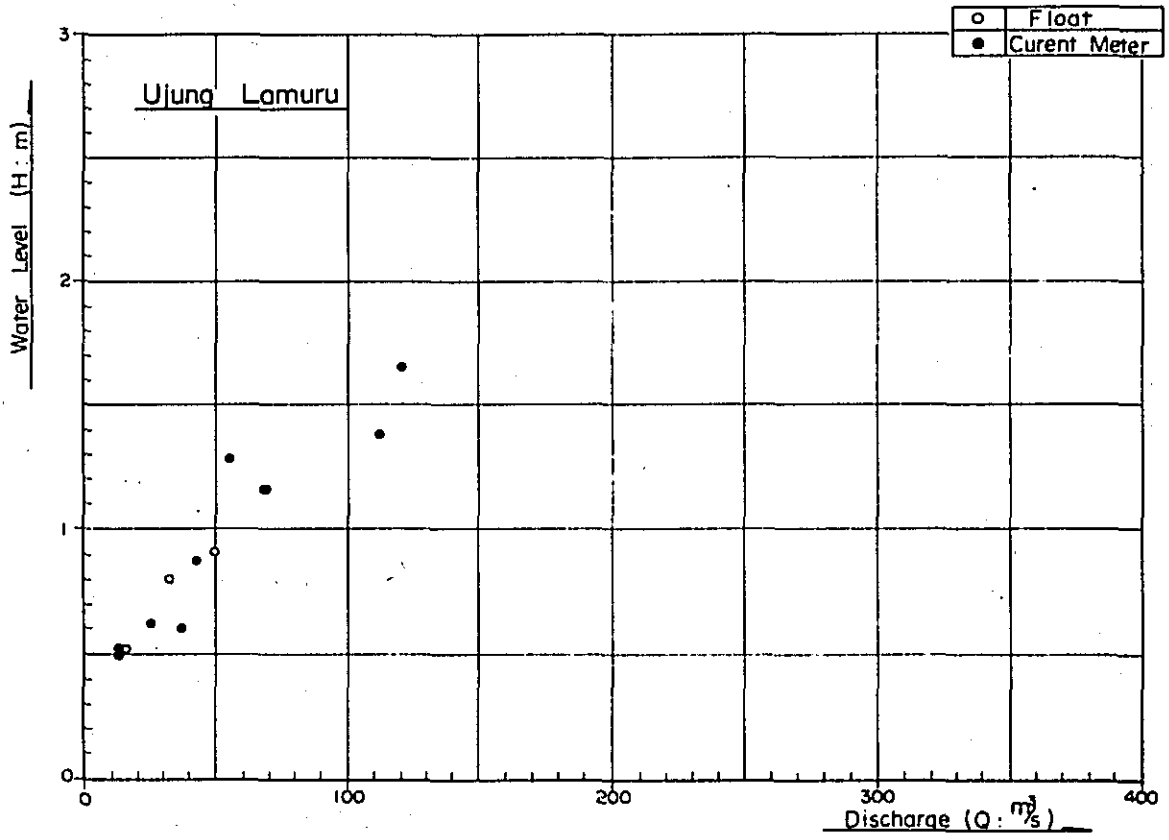


Fig. 8-1 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	21. 7.1974	16:45 - 17:50	73.0	60.560	0.860	1.540	52.315	● P3SA
2	9. 1.1975	13:50 - 14:20	43.0	26.070	1.000	1.180	28.760	● "
3	19. 3.1975	7:40 - 8:50	65.0	60.600	0.780	1.280	57.920	● "
4	13. 6.1975	17:00 - 17:45	70.0	97.260	0.920	2.060	90.307	● "
5	14. 7.1975	16:25 - 18:20	61.5	198.100	0.980	3.140	203.850	● "
6	3. 9.1975	11:30 - 12:45	55.0	42.350	0.778	1.400	36.935	● "
7	25. 9.1975	8:00 - 9:45	72.0	127.350	0.920	2.560	125.495	● "
8	20.10.1975	12:45 - 13:30	57.5	44.465	0.700	1.480	37.090	● "
9	21.10.1975	17:30 - 18:25	47.0	21.780	0.900	0.900	19.660	● "
10	28.12.1975	9:00 - 9:45	40.0	16.590	0.760	0.610	12.570	● "
11	2. 2.1976	11:45 - 12:00	41.0	12.790	0.773	0.570	10.766	● "
12	19. 4.1976	13:35 - 14:49		48.130	0.632	1.245	30.450	○ "
13	8. 5.1976	13:30 - 14:10		239.520	1.127	3.800	270.028	○ "
14	10. 5.1976	9:45 - 10:30		100.450	0.901	1.820	90.560	○ "
15	10. 5.1976	11:30 - 12:05	59.0	68.350	0.619	1.740	42.330	● "
16	12. 6.1976	17:20 - 18:12		319.730	1.424	5.050	455.423	○ "
17	13. 6.1976	11:00 - 12:00		210.996	1.028	3.300	217.038	○ "
18	24. 7.1976	15:00 - 15:50	31.5	31.550	0.623	1.080	21.369	● "
19	24. 7.1976	16:00 - 16:30		40.375	0.739	1.060	30.393	○ "
20	6. 8.1976	11:30 - 12:10	30.5	24.420	0.589	0.890	16.772	● "

Fig. 8-2 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	18. 7.1975	14:55 - 16:00	68.0	242.450	0.430	1.380	112.660	● P3SA
2	14. 9.1975	12:40 - 13:50	46.0	200.230	0.264	1.160	69.790	● "
3	29. 9.1975	9:15 - 10:10	54.5	284.970	0.117	0.620	24.360	● "
4	22.10.1975	9:15 - 10:10	47.0	179.910	0.288	1.160	69.120	● "
5	5.12.1975	13:45 - 14:45	30.0	143.250	0.390	1.280	55.830	● "
6	26.12.1975	14:30 - 15:15	28.5	134.510	0.330	0.870	43.175	● "
7	3. 2.1976	10:15 - 11:30	47.0	159.490	0.685	1.650	121.224	● "
8	13. 5.1976	10:00 - 11:30		132.405	0.377	0.910	49.950	○ "
9	17. 6.1976	10:30 - 11:30		122.050	0.262	0.800	32.061	○ "
10	23. 4.1976	14:00 - 14:35		114.800	0.328	0.600	37.624	● "
11	28. 7.1976	9:40 - 10:55	70.0	107.525	0.107	0.520	12.336	● "
12	28. 7.1976	11:10 - 13:50		102.850	0.142	0.520	14.914	○ "
13	7. 8.1976	12:00 - 14:00	65.5	121.410	0.119	0.520	15.447	● "
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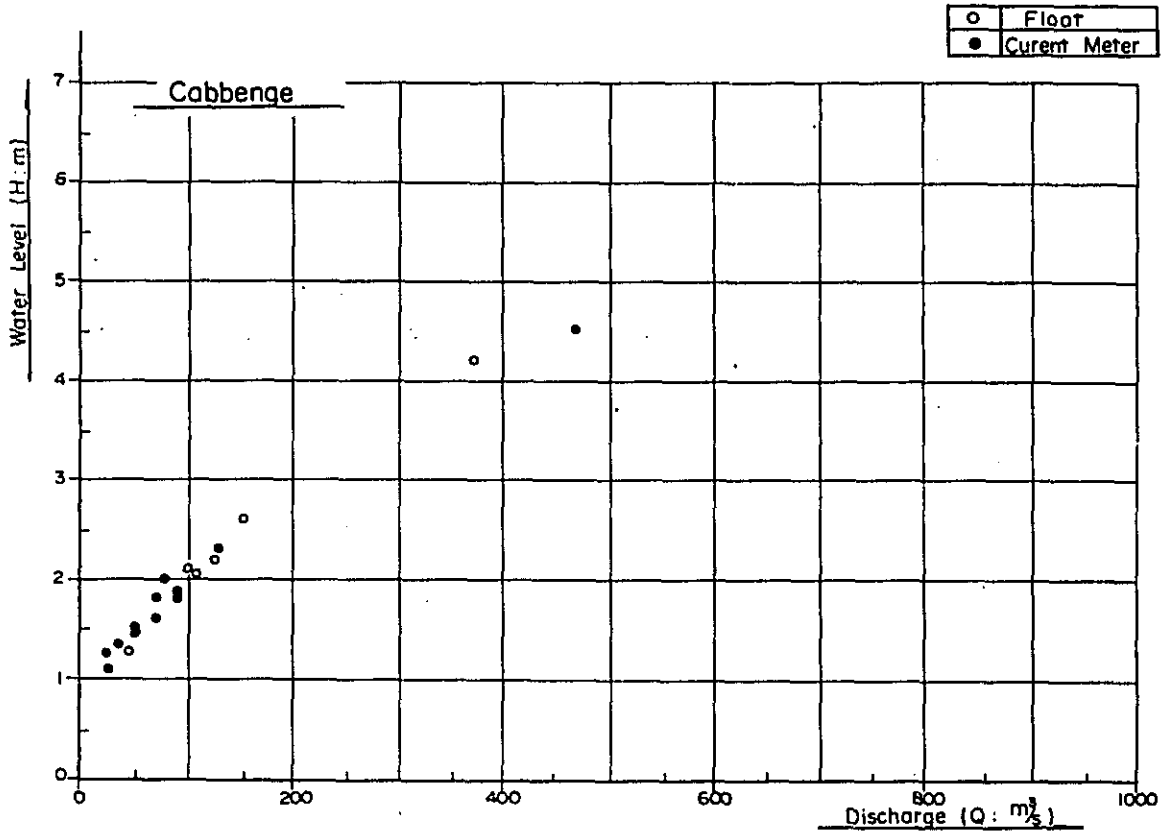
Fig. 8-3 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	27.11.1974	165'	82.0	85.400	0.600	1.520	50.900	● DPMA
2	20. 1.1975	95'	86.0	121.000	0.750	1.850	91.400	● "
3	3. 3.1975	130'	83.8	151.000	0.860	2.330	130.000	● "
4	16. 6.1975	175'	85.0	363.000	1.297	4.520	471.000	● "
5	26. 8.1975	70'	47.0	67.900	0.550	1.340	37.000	● "
6	9.10.1975	80'	83.0	104.000	0.690	1.830	71.900	● "
7	22.11.1975	75'	85.0	75.200	0.690	1.440	52.200	● "
8	30.12.1975	60'	74.5	95.000	0.753	1.610	72.000	● "
9	9. 3.1976	80'	84.5	112.000	0.811	1.800	90.800	● "
10	22. 4.1976	11:25 - 11:55		65.680	0.711	1.270	46.752	○ P3SA
11	6. 5.1976	15:00 - 16:00		311.960	1.200	4.200	374.350	○ "
12	9. 5.1976	11:00 - 12:30		129.145	0.778	2.100	100.513	○ "
13	11. 5.1976	——		154.560	0.701	2.040	108.418	○ "
14	12. 6.1976	12:00 - 13:00		136.762	0.931	2.190	127.367	○ "
15	13. 6.1976	15:00 - 16:00		171.367	0.894	2.600	153.829	○ "
16	10. 5.1976	16:40 - 17:40	89.0	131.130	0.603	2.010	79.045	● "
17	22. 4.1976	14:00 - 14:30	78.0	67.600	0.353	1.260	23.839	● "
18	6. 8.1976	15:20 - 15:55	85.0	52.400	0.506	1.080	27.725	● "
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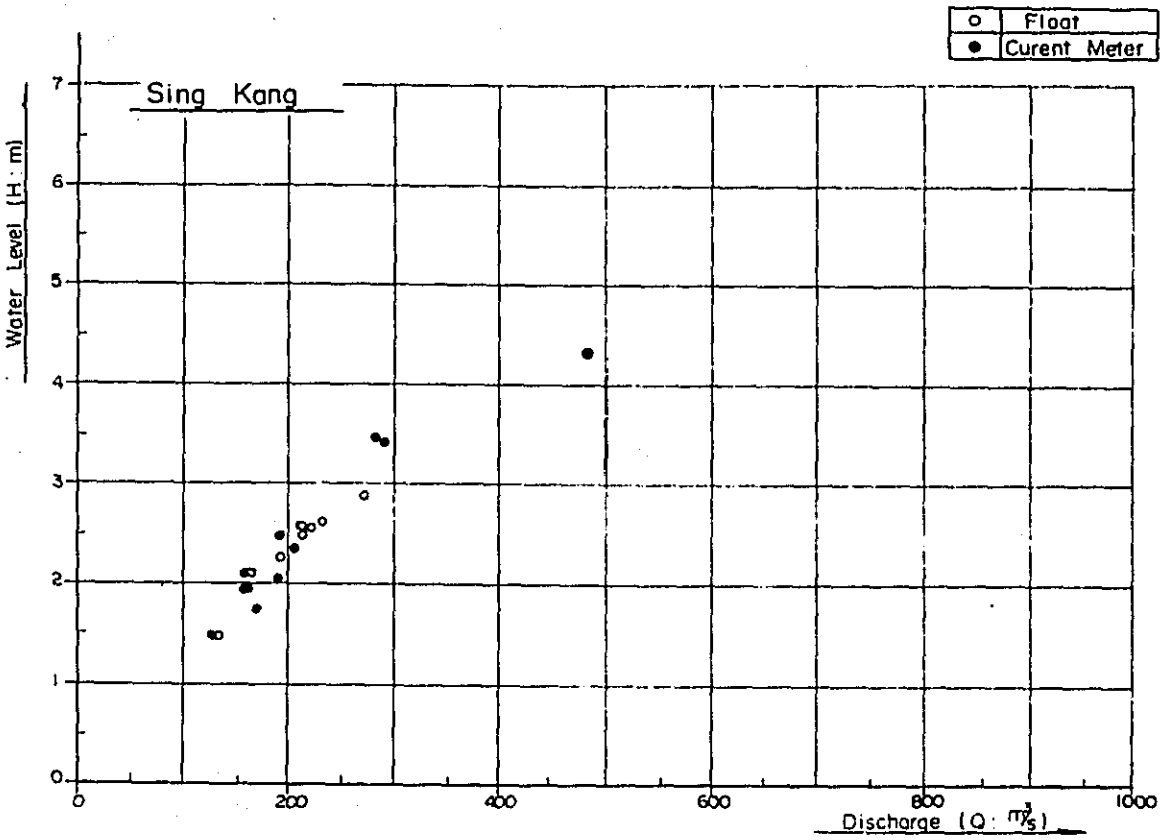
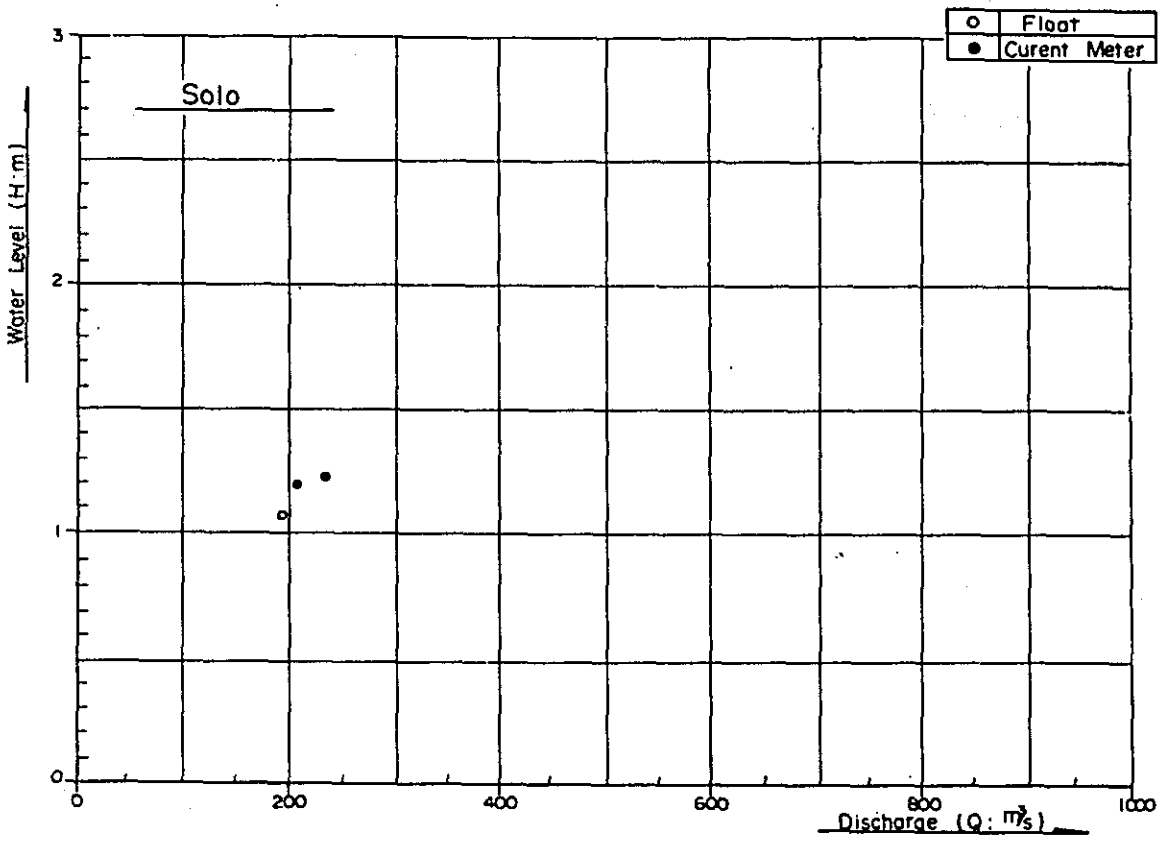
Fig. 8-4 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	29.11.1974	220'	101.0	268.000	0.590	1.900	158.000	● DPMA
2	20. 1.1975	87'	103.0	236.000	0.740	1.790	174.000	● "
3	1. 3.1975	142'	102.0	223.000	0.750	1.920	169.000	● "
4	16. 6.1975	75'	112.0	483.000	0.990	4.320	478.000	● "
5	28. 8.1975	95'	99.0	356.700	0.840	3.400	299.000	● "
6	5.10.1975	135'	105.0	320.500	0.870	3.440	285.000	● "
7	23.11.1975	95'	100.0	264.000	0.790	2.360	207.000	● "
8	30.12.1975	100'	99.5	232.000	0.831	2.050	193.000	● "
9	9. 3.1976	105'	96.0	179.000	0.728	1.490	130.000	● "
10	20. 4.1976	11:13 - 11:45		183.243	0.697	1.470	127.795	○ P3SA
11	8. 5.1976	10:00 - 12:10		332.425	0.841	2.860	279.799	○ "
12	11. 6.1976	10:15 - 11:00		269.720	0.731	2.280	197.399	○ "
13	13. 6.1976	18:00 - 19:00		291.600	0.805	2.590	234.889	○ "
14	15. 6.1976	9:20 - 10:30		295.725	0.752	2.530	222.539	○ "
15	24. 7.1976	8:30 - 10:00	94.0	273.020	0.702	2.550	205.490	● "
16	24. 7.1976	10:30 - 11:40		262.625	0.781	2.550	210.693	○ "
17	27. 7.1976	10:30 - 12:25		287.250	0.728	2.450	210.529	○ "
18	27. 7.1976	13:00 - 14:20	92.0	259.975	0.698	2.450	191.085	● "
19	5. 8.1976	15:10 - 16:00	92.0	238.400	0.642	2.070	163.532	● "
20	5. 8.1976	16:20 - 17:25		247.689	0.671	2.070	167.820	○ "

Fig. 8-5 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	29. 7.1976	8:20 - 9:00	76.0	297.530	0.736	1.220	236.786	● P3SA
2	29 7.1976	10:40 - 11:10		277.682	0.688	1.070	194.870	○ "
3	5. 8.1976	10:30 - 11:10	75.0	282.230	0.663	1.195	208 219	● "
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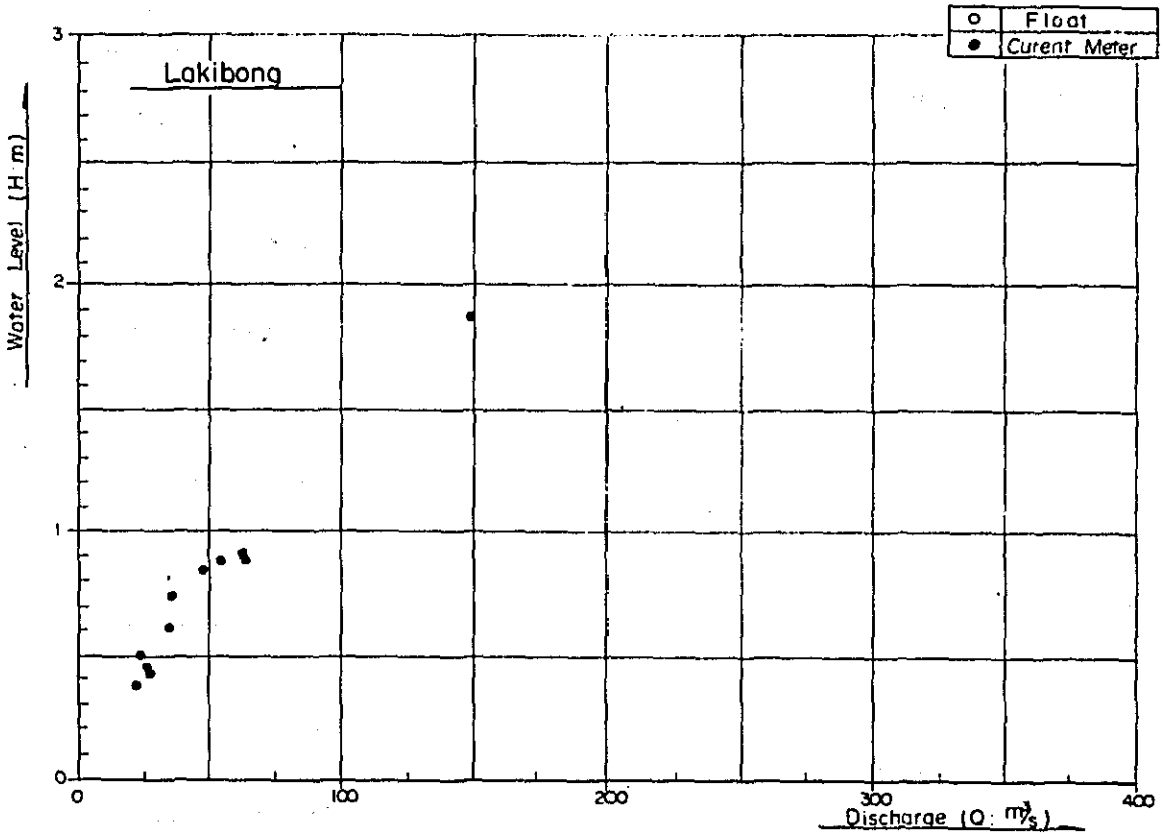
Fig. 8-6 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	17. 7.1975	13:00 - 14:00	84.0	71.680	0.600	2.780	46.749	• P3SA
2	5. 9.1975	11:30 - 12:55	81.0	69.290	0.511	0.730	37.849	• "
3	26. 9.1975	14:00 - 16:30	89.0	164.890	0.813	1.950	149.660	• PMA
4	19 10.1975	10:30 - 11:35	87.0	54.470	0.560	0.500	22.610	• "
5	23.11.1975	8:15 - 9:30	88.0	90.780	0.690	0.890	62.260	• "
6	27.12.1975	9:30 - 10:20	88.0	86.960	0.710	0.900	61.960	• P3SA
7	1. 2.1976	8:10 - 9:25	81.0	58.790	0.573	0.610	34.571	• "
8	3. 3.1976	10:00 - 11:10	85.0	80.300	0.135	0.840	44.819	• "
9	30. 3.1976	8:30 - 9:45	86.0	89.900	0.630	0.870	56.461	• "
10	26. 7.1976	11:30 - 12:30	83.0	48 150	0.430	0.450	24.547	• "
11	28 7.1976	14:40 - 15:50	82.5	50.463	0.450	0.380	22.017	• "
12	7. 8.1976	9:10 - 9:50	82.5	43.900	0.568	0.420	25.884	• "
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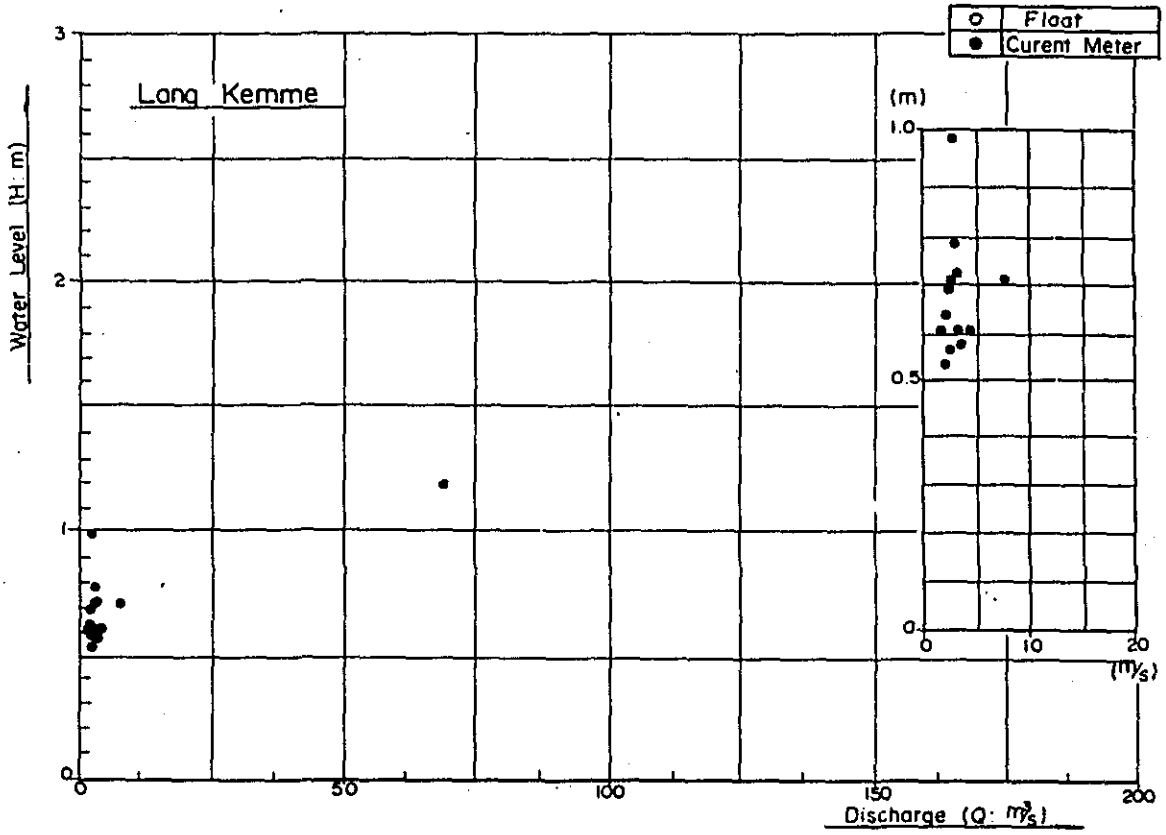
Fig. 8-7 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	23. 5.1974	10:15 - 12:00	37.0	18.890	0.160	0.710	3.020	• P3SA
2	13 1.1975	10:30 - 12:00	36.0	61.140	1.140	1.180	69.360	• "
3	14. 6.1975	9:00 - 10:00	18.0	9.600	0.440	0.600	4.190	• "
4	17. 7.1975	8:05 - 9:05	25.0	12.030	0.190	0.700	2.360	• "
5	5. 9 1975	14:05 - 15:15	22.5	11.840	0.236	0.600	3.321	• "
6	27 9.1975	8:15 - 9:15	23.0	14.710	0.113	0.630	2.020	• "
7	19.10.1975	14:30 - 15:20	23.0	10.745	0.161	0.530	2.050	• "
8	5.12.1975	16:40 - 18:00	35.5	34.500	0.660	0.980	2.700	• "
9	26.12 1975	16:30 - 17:30	22.0	14.300	0 540	0.700	7.700	• "
10	1. 2.1976	10:45 - 11:30	22.5	11.740	0.267	0.560	2 599	• "
11	3. 3.1976	12:00 - 12:45	21 5	12.030	0.276	0.570	3.551	• "
12	29. 3.1976	16:00 - 17:00	28.0	30.030	0.105	0.770	2.860	• "
13	26. 7.1976	13:00 - 13:50	23.0	13.770	0.171	0.680	2.116	• "
14	7. 8.1976	10:10 - 10:40	17.5	9.775	0.129	0.600	1.480	• "
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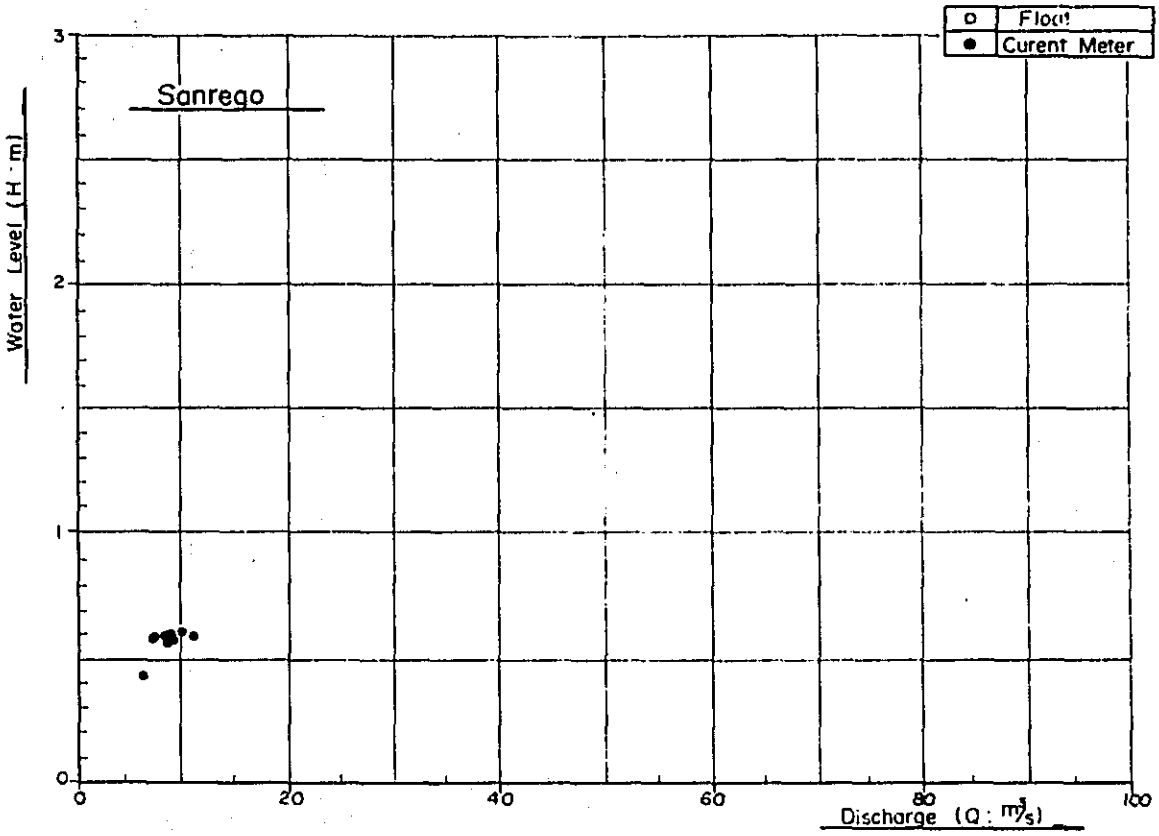
Fig. 8-8 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	15. 9.1973	13:35 - 14:15	28.0	14.520	0.390	0.420	6.100	● DPU
2	21.11.1973	10:25 - 11:30	25.0	21.750	0.400	0.580	9.000	● "
3	22. 7.1974	16:30 - 17:45	30.0	20.800	0.470	0.600	9.780	● P3SA
4	11. 1.1975	8:55 - 10:30	21.0	21.010	0.440	0.580	11.000	● "
5	2. 9.1975	17:15 - 18:00	33.0	9.440	0.620	—	6.980	● "
6	28. 9.1975	8:50 - 10:10	26.0	13.220	0.428	0.580	7.370	● "
7	21.10.1975	15:30 - 17:00	27.0	14.190	0.550	0.560	8.950	● "
8	7.12.1975		26.5	13.800	0.640	0.590	8.790	● "
9	29.12.1975	16:00 - 17.25	27.0	14.610	0.610	0.560	8.940	● "
10	30. 1.1976	16:00 - 17:30	26.0	13.040	0.450	0.570	7.021	● "
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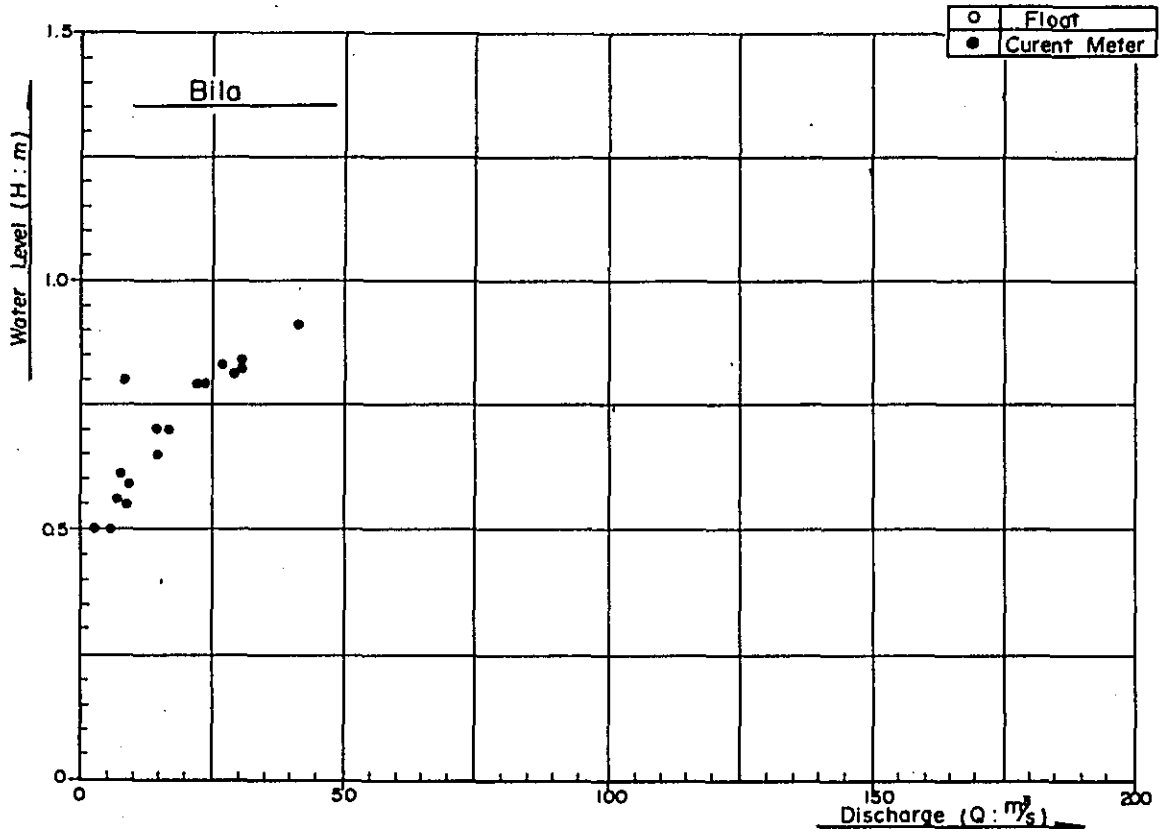
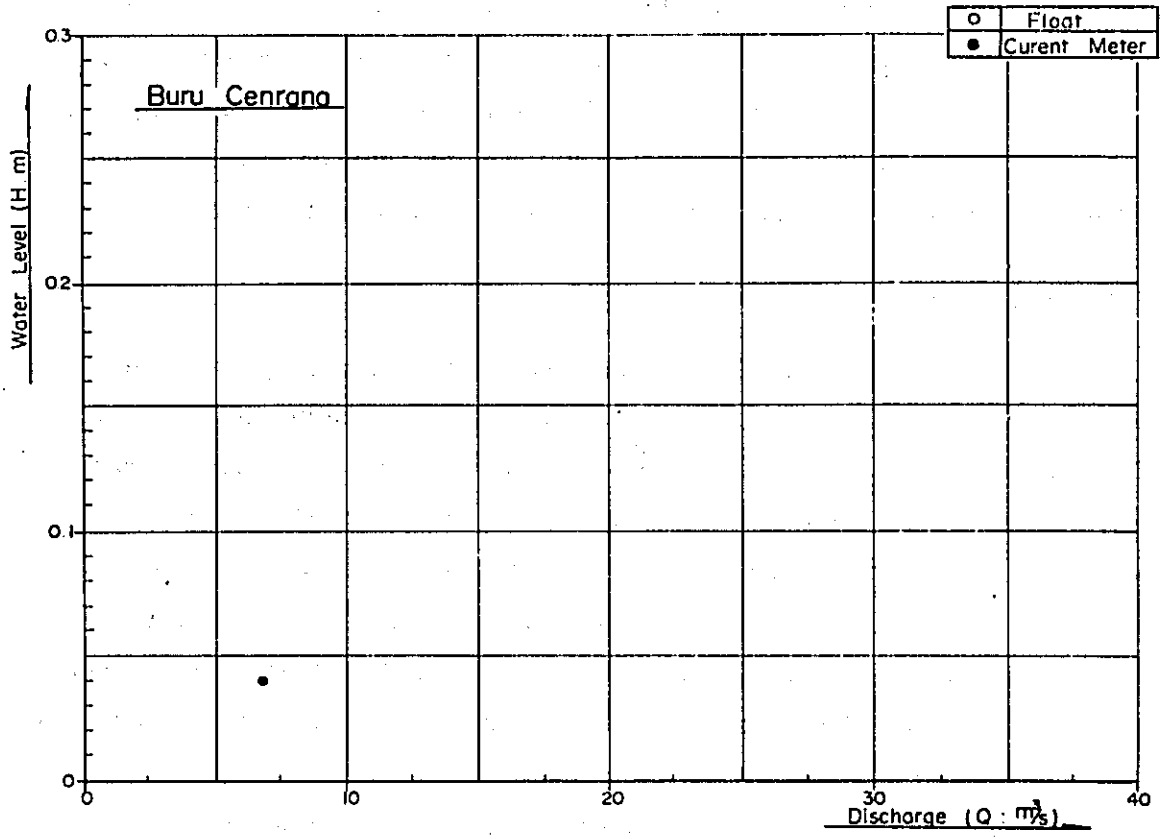
Fig. 8-9 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	iver Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	13. 9.1973	16:00 - 17:15	84.0	71.990	0.540	0.910	41.830	• DPU
2	4.11.1973	10:10 - 11:05	84.0	62.800	0.440	0.820	30.810	• "
3	22. 5.1974	13:15 - 15:00	84.0	64.620	0.399	0.810	29.180	• P3SA
4	9. 1.1975	10:30 - 11:35	63.0	49.170	0.140	0.610	7.720	• "
5	19. 3.1975	13:00 - 14:05	79.0	62.550	0.160	0.790	22.310	• "
6	13. 6.1975	14:15 - 15:00	86.5	70.000	0.370	0.840	30.610	• "
7	15. 7.1975	11:00 - 12:00	86.0	66.780	0.340	0.830	27.170	• "
8	3. 9.1975	14:00 - 15:30	87.0	52.190	0.223	0.700	14.320	• "
9	25. 9.1975	11:25 - 12:30	84.0	60.220	0.334	0.790	23.790	• "
10	20.10.1975	10:00 - 11:15	87.0	58.250	0.260	0.700	16.950	• "
11	21.11.1975	14:00 - 16:50	67.0	47.980	0.190	0.590	9.080	• "
12	28.12.1975	11:00 - 11:45	63.0	45.480	0.130	0.500	5.920	• "
13	2. 2.1976	9:10 - 9:45	54.0	36.600	0.056	0.500	2.813	• "
14	4. 3.1976	8:30 - 9:30	62.0	43.740	2.515	0.560	7.059	• "
15	31. 3.1976	12:00 - 12:45	75.0	60.820	0.131	0.800	8.255	• "
16	25. 7.1976	15:00 - 16:00	75.0	73.715	0.193	0.650	14.808	• "
17	6. 8.1976	9:30 - 10:10	74.5	66.875	0.128	0.550	8.930	• "
18								
19								
20								

Fig. 8-10 OBSERVATION DATA OF WATER STAGE AND DISCHARGE



No.	Date	Time	River Width (m)	Cross Section (m^2)	Water Velocity (m)	Water Level (m)	Discharge (m^3/s)	Remarks
1	26. 7.1976	11:00 - 12:00	31.5	9.03	0.626	0.04	6.881	● P3SA
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3. Data Arrangement and Some Analysis

On the basis of the collected hydrological data as mentioned in the foregoing, this section presents such results as basic data, collected and pigeonholed on the spot, to mention a few here, monthly rainfall correlation, hourly rainfall distribution, water-stage correleation among observation stations, probable daily rainfall and calculation of "Manning" roughness coefficient based on observation data.

3.1 Monthly Rainfall Correlation

Monthly Rainfall Correlation among observation stations plays an important part in the analysis of the rainfall characteristics of the basin concerned. It sometimes happens that there are no observation data due to raingauge trouble and other reasons. This type of accidents take place at the observation stations located an important position in the objective basin, it becomes necessary to substitute the rainfall data of this station with that of the most correlative station. Out of the raingauge stations, such as Takalala, Watan Soppeng, Sing Kang(2), Palaguna, Tanru Tedong(2), Maradda, Watan Pone, Ujung Lamuru (1), etc. where data are relatively complete are picked up, and monthly rainfall correlation among observation stations mentioned above are prepared as shown in Fig.9. General tendency of correlation may be observed in the chart, however, a degree of the accuracy is not too high. Especially, as tendency of plot is obviously scatter with increasing in volume of rainfall, it is recommended to perform further detailed studies of the matter taking causes of rainfall and topographical factors into consideration.

3.2 Hourly Rainfall Distribution

To grasp hourly distribution pattern of rainfall, through rainfall data from five automatic raingauge stations, such as Burucenrana, Sing Kang, Cabbenge, Ujung Lamuru and Camba, ratio between total rainfall ($\sum_{t=1}^{n} r_t$) and hourly rainfall (r_t), and accumulation percentage of hourly rainfall ($\sum_{t=1}^{n} Pi$) are computed in regard to flood groups as shown in Table 7, and the results obtained are as shown in Table 10 and Fig.10. Only single rainfall which is above $\sum_{t=1}^{n} r_t$ = 25 mm is considered in the study, and rainfalls separated by six hours from off-time of one rainfall to on-time of the immediate next is regarded as an

individual rainfall. According to Fig.10, rainfall duration of 90% of the total amount of single rainfall is mostly less than ten hours. The duration period of rainfall is divided into four patterns - 5, 10, 15 hours approx. and longer. Though period of rainfalls generally fall into the four categories as mentioned above, there seems to be some problems to solve in the standards set for a single rainfall. In the cases of rainfalls of a longer duration, a period of torrential downpour is normally limited to about three hours.

3.3 Probable Daily Rainfall

From the maximum annual daily rainfall as shown in Table 5, an excess probability of daily rainfall at Takalala, Watan Soppeng, Sing Kang and Watan Pone, was found by Thomas method, and Hazen method which are the simplest.

Thomas Method: $$Fn(Xi) = \frac{i}{(N + 1)}$$

Hazen Method: $$Fn(Xi) = \frac{(2i - 1)}{2N}$$

Where: N : Number of data.

i : Ordinal number started from the largest

The results of computation is as shown in Table 11 and Fig.11.

Table 11 Probable Daily Rainfall

1/T	Takalala		Watan Soppeng		Sing Kang		Watan Pone	
	Thomas	Hazen	Thomas	Hazen	Thomas	Hazen	Thomas	Hazen
2	83.0	83.0	87.3	87.3	79.1	79.1	102.3	102.3
5	126.3	120.3	130.8	124.9	103.6	99.9	140.3	134.4
10	157.3	146.0	161.5	150.7	119.4	112.9	165.6	155.0
20	188.6	171.3	192.2	175.9	134.1	124.8	189.8	174.2
30	207.2	186.2	210.5	190.6	142.5	131.5	203.9	185.5
50	231.2	205.1	233.8	209.3	152.9	139.8	221.4	199.2
70	248.4	218.5	250.5	222.5	160.1	145.5	233.7	208.7
80	254.0	222.8	255.9	226.7	162.4	147.3	237.6	211.7
100	264.9	231.2	266.5	235.0	166.9	150.8	245.3	217.6
150	285.3	246.8	286 2	250.4	175.0	157.1	259.4	228.3
200	300.0	258.1	300.4	261.4	180.8	161.5	269.5	236.0

Note: Thomas Plot only is shown in Fig.11 and "T" is excessive probability year.

3.4 Daily Water-stage Correlation

From the daily water-stage records as shown in Fig.2, water-stage correlation among the observation stations as shown in Fig.12 was obtained. The water-stage correlations among such stations as Tanru Tedong ~ Bila, Cabbenge ~ Patjong Kang, Sing Kang ~ Cenranae, Sing Kang ~ L.Tempe, Ujung Lamuru ~ Cabbenge, are relatively better co-ordinated, but ones among other stations are almost none or very poor showing a tendency of scattered plots in the higher ranges of water-stage.

3.5 "Manning" Roughness Coefficient

To know roughness coefficient of a river is an important factor to fully understand hydraulic characteristics of the river and there are many computation methods for the purpose. From the flow discharge observation records in the foregoing section, roughness coefficient was obtained by the most popular Manning's average flow velocity formula.

$$n = I^{1/2} R^{2/3} / V$$

where

n : Mannings's roughness coefficient.

I : Water surface gradient.

R : Hydraulic mean depth (m)

V : Mean velocity (m/s)

The results obtained are shown in Table 13 and Fig.13.

Table 12 Roughness Coefficient of Natural River Channel

Channel	Condition of Channel	Roughness Coefficient (n ; $\times 10^{-2}$) 1 2 3 4 5 6 7 8
Small Channel in Plain	No weeds and straight no cracks or deep water	
do	Same as above except a fair amount of stones and weeds	
do	No weeds but meanders with deep pools and shallows	
do	Same as above but a fair amount of stones and weeds	
do	Same as above but low water stage	
do	Considerable amount of stones	
do	Low flow velocity : weeds and deep pools	
Channel in Mountain Area	River bed covered with small and some large stones	
do	Cobble stone of more of larger stones	
Large Channel	Normal section without large cobble stones and shrubs	
do	Irregular and rough section	

In regard to roughness coefficient, it is generally interpreted in figures based on an experience rating as shown in Table 12. Values of roughness coefficient (n) obtained from our actual observations by means of inverse calculations also range between 0.02 and 0.07. With small number of actual observation values obtained only at low-water channels, it is not practical to draw a hasty conclusions but it may safely be assumed, taking findings of our recent reconnaissance, that values of rough coefficient at Cabbenge, Tanru Tedong and Bila are between 0.025 and 0.03, and at Ujung Lamuru and Lang Kemme should show a slightly higher values.

3.6 Proposal for Hydrological Analysis

This hydrological deta book is to be prepared for the purpose mentioned below.

i) To calculate the design discharge of each river system.

ii) To calculate the low water discharge of each river system.

iii) To investigate run-off mechanics between water-stage of the Lake Tempe and run-off discharge from the river system around the Lake Tempe.

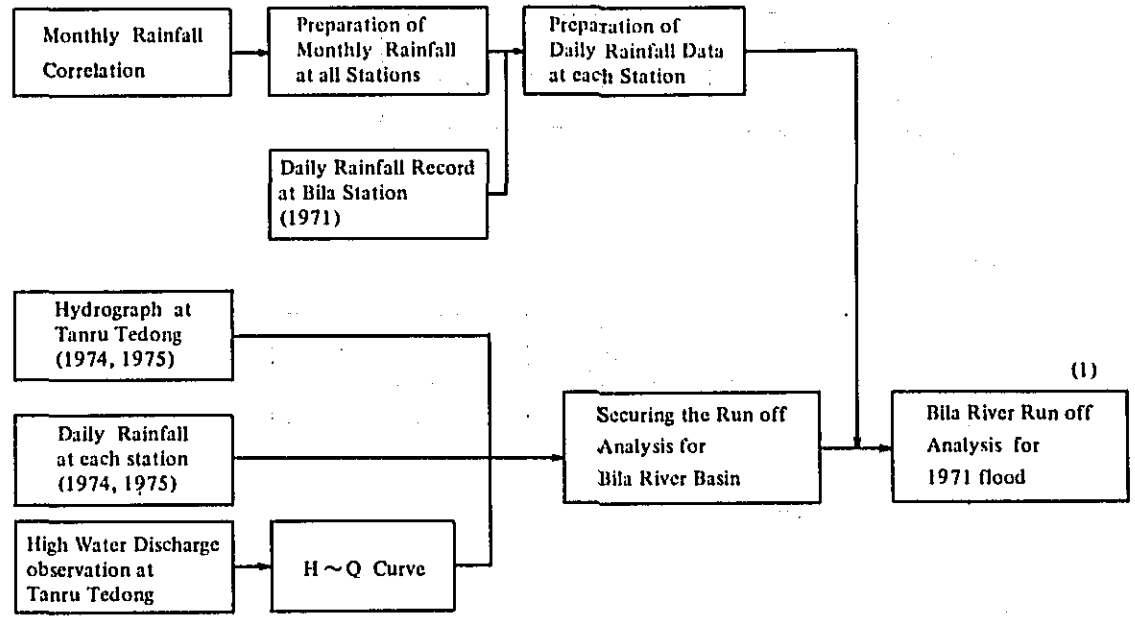
It goes without saying that conception for run-off mechanics would be more secure one as hydrological data is arranged more completely henceforth, however it may be possible to analyse the correlative run-off mechanics between the Lake Tempe water-stage fluctuation and run-off discharge from the existing data by using an electronic computer. The proposal flow-chart for hydrological analysis are mentioned bellow, and the purpose of this analysis is to calculate run-off discharge which flow into the Lake Tempe from the Walanae River basin and the Bila River basin, run-off discharge from the Cenranae River basin which flow out from the Lake Tempe, and also to grasp the Lake Tempe water-stage fluctuation more completely from hydrological observation data.

If calculation results of the Lake Tempe water-stage fluctuation is approximately correspond to actual water-stage fluctuation record from 1969 to 1972, it would be proved that the run-off mechanics of the basin is hydrologically secure, and also it would be available for making the water resources development planning of this area.

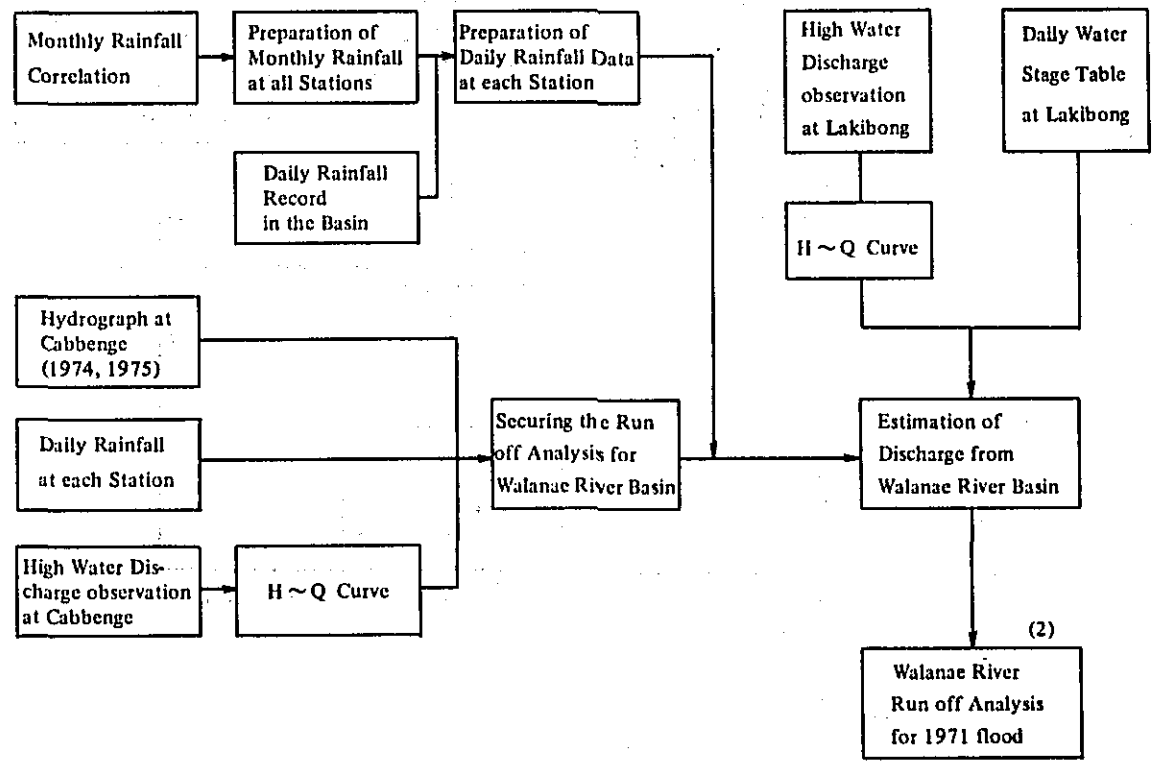
GENERAL FLOW CHART for HYDROLOGICAL ANALYSIS

Example of 1971 Flood

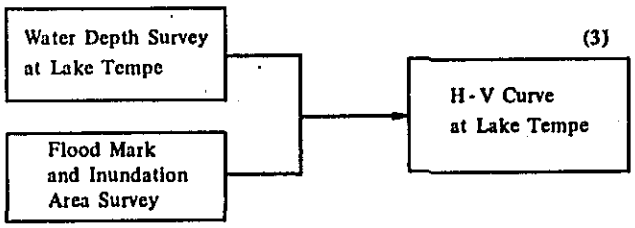
The First Step : Bila River Basin



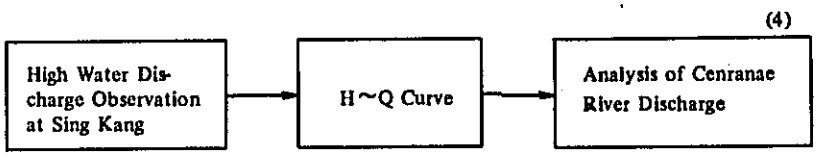
The Second Step : Walanae River Basin



The Third Step : Lake Tempe



The Fourth Step : Cenranae River



The Fifth Step : Composite Analysis

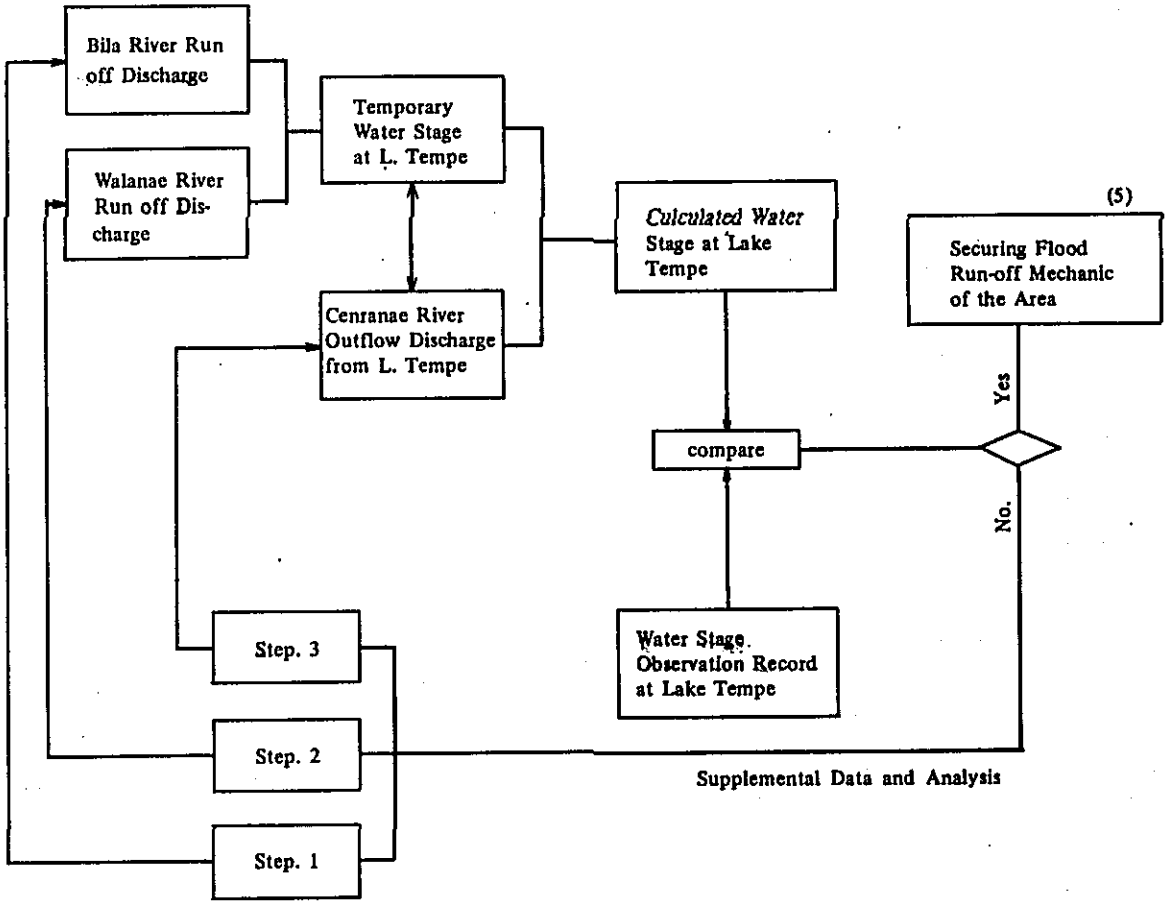


Fig. 9 - 1 MONTHLY RAINFALL CORRELATION

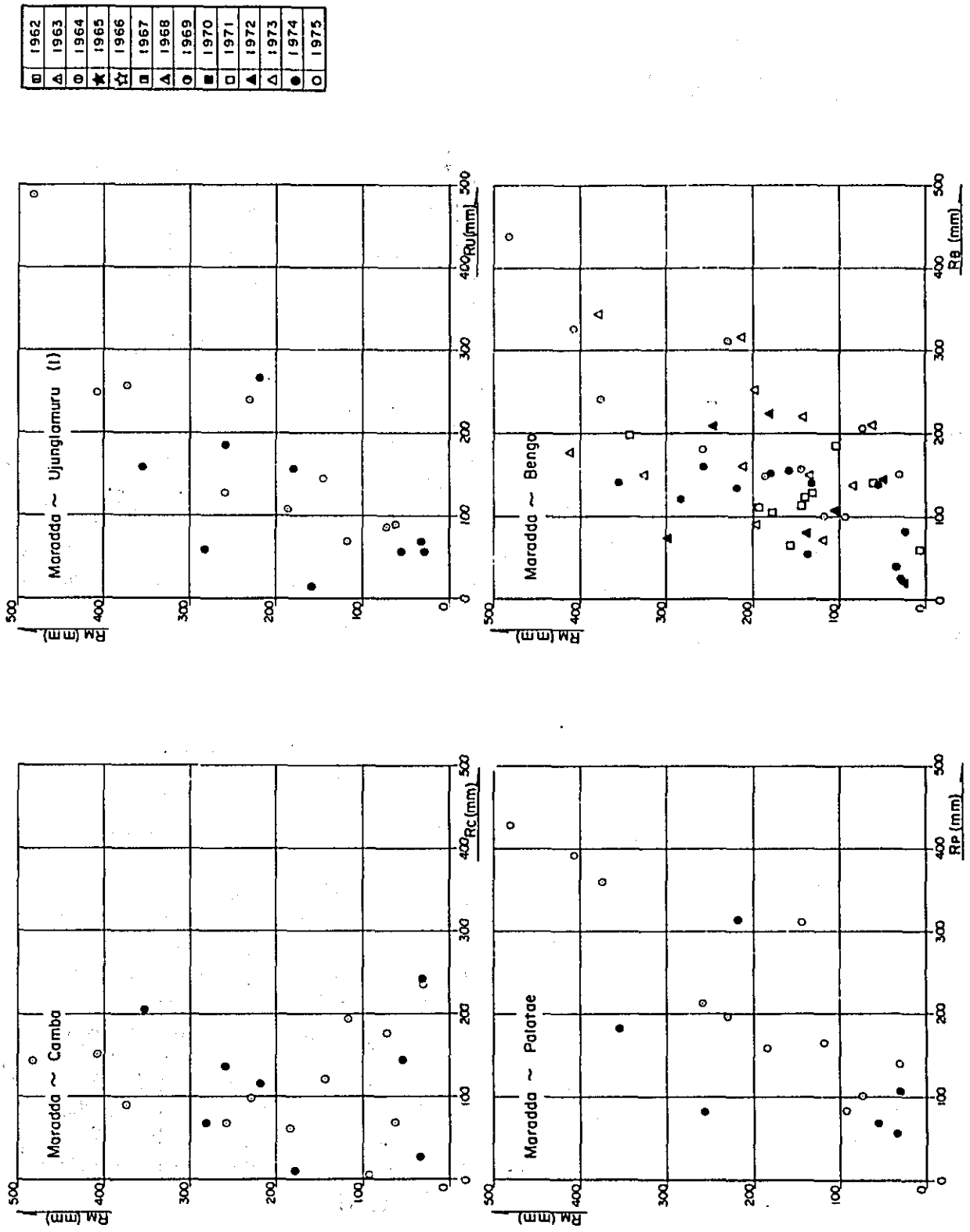


Fig. 9-2 MONTHLY RAINFALL CORRELATION

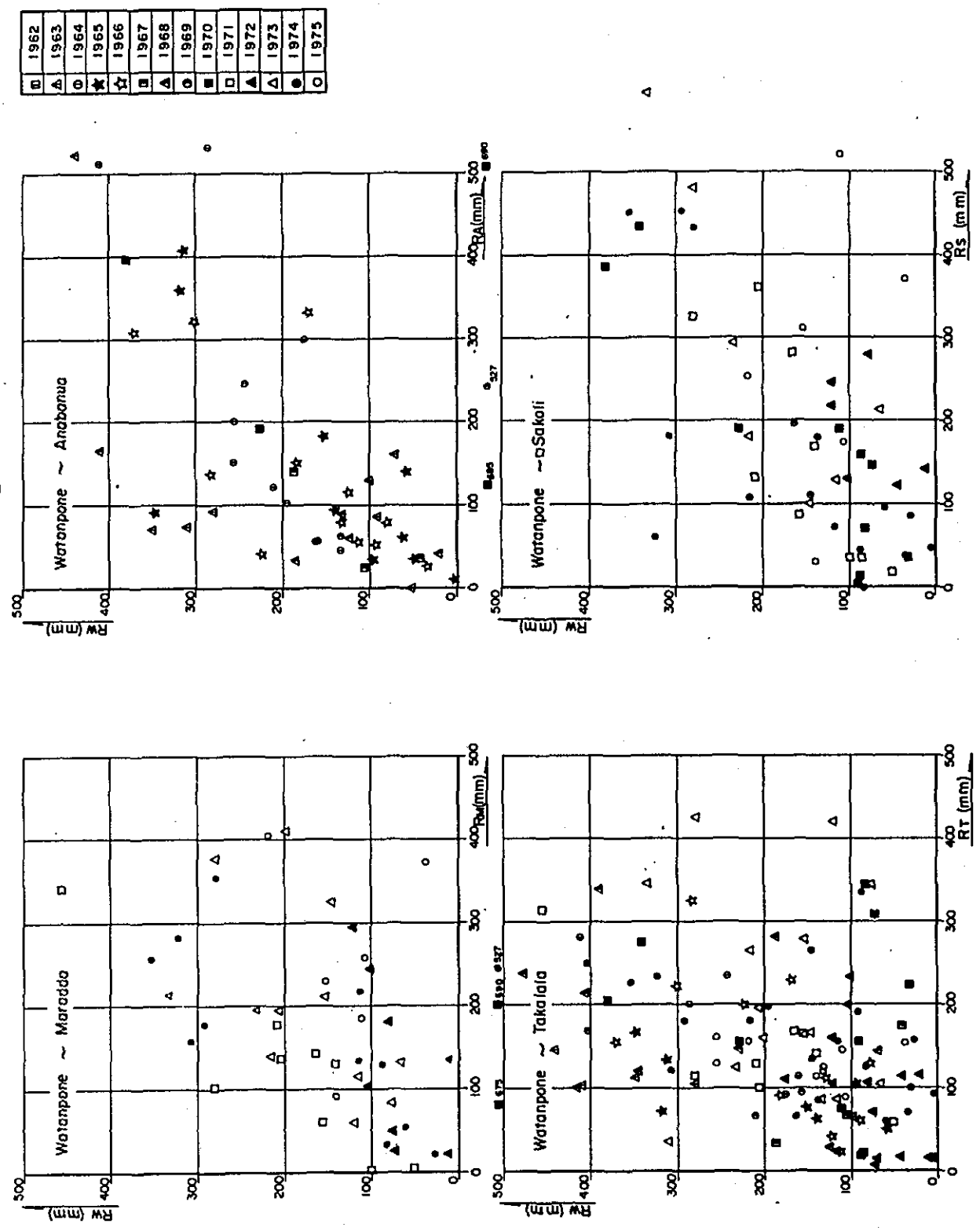


Fig. 9-3 MONTHLY RAINFALL CORRELATION

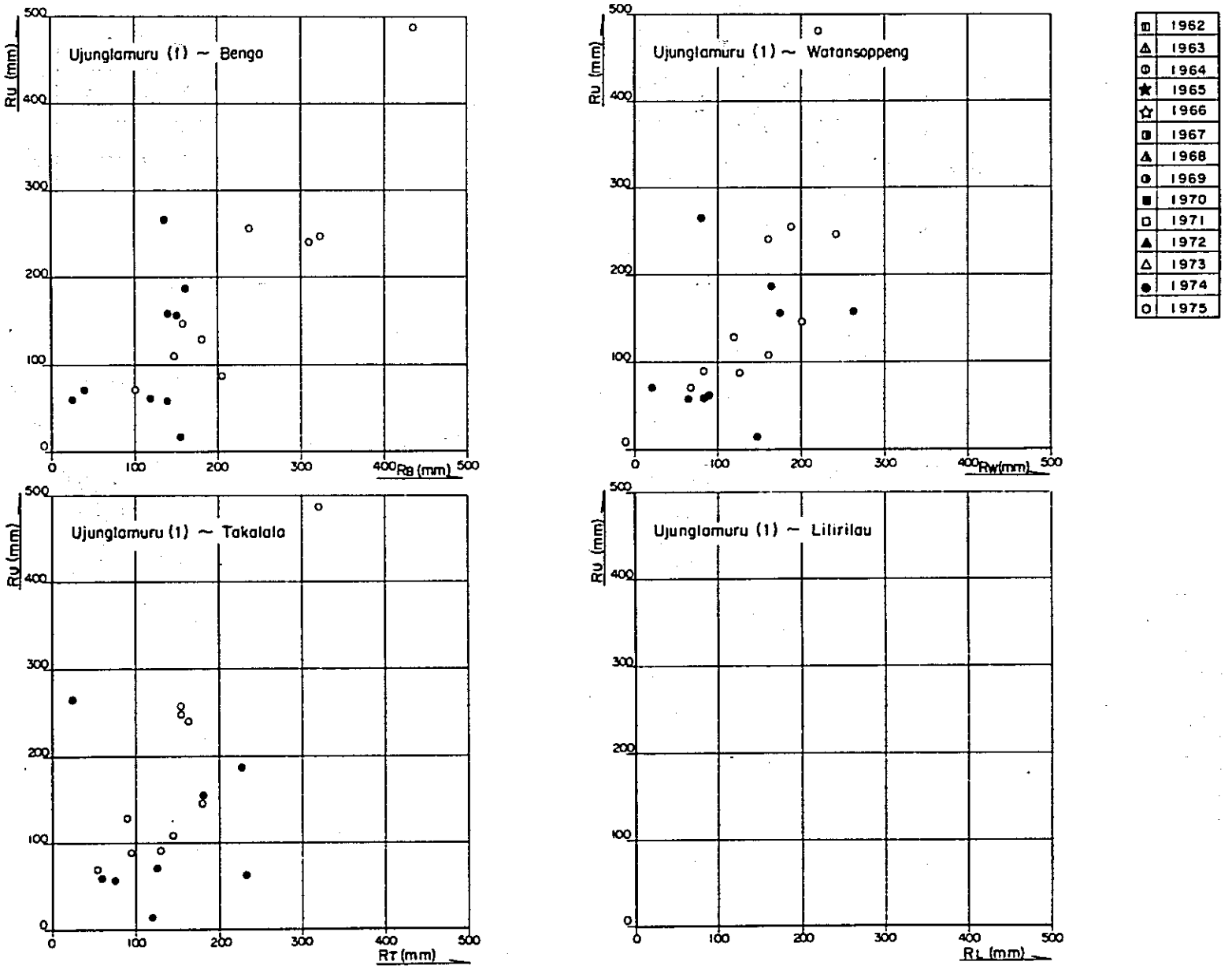


Fig. 9-4 MONTHLY RAINFALL CORRELATION

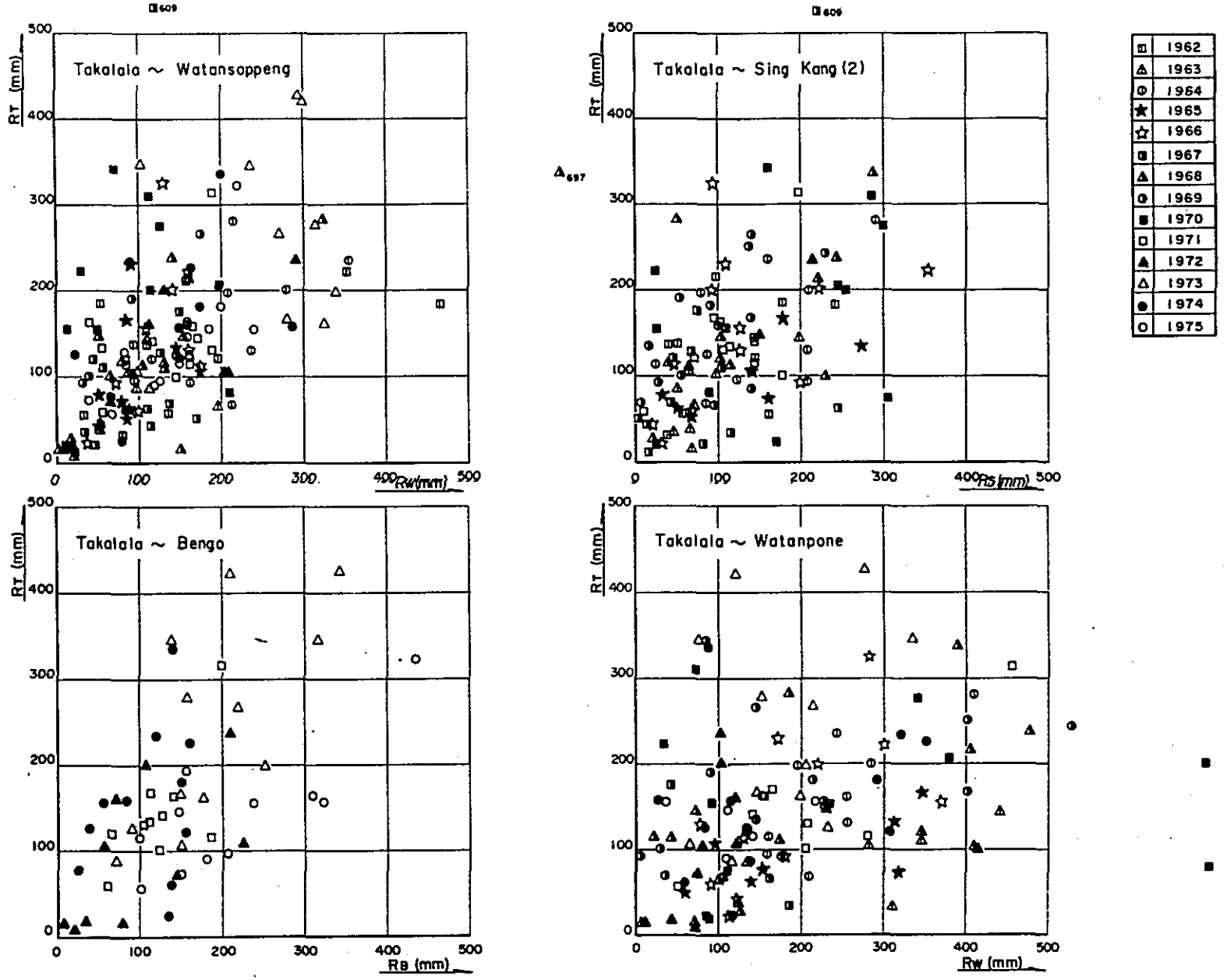


Fig. 9-5 MONTHLY RAINFALL CORRELATION

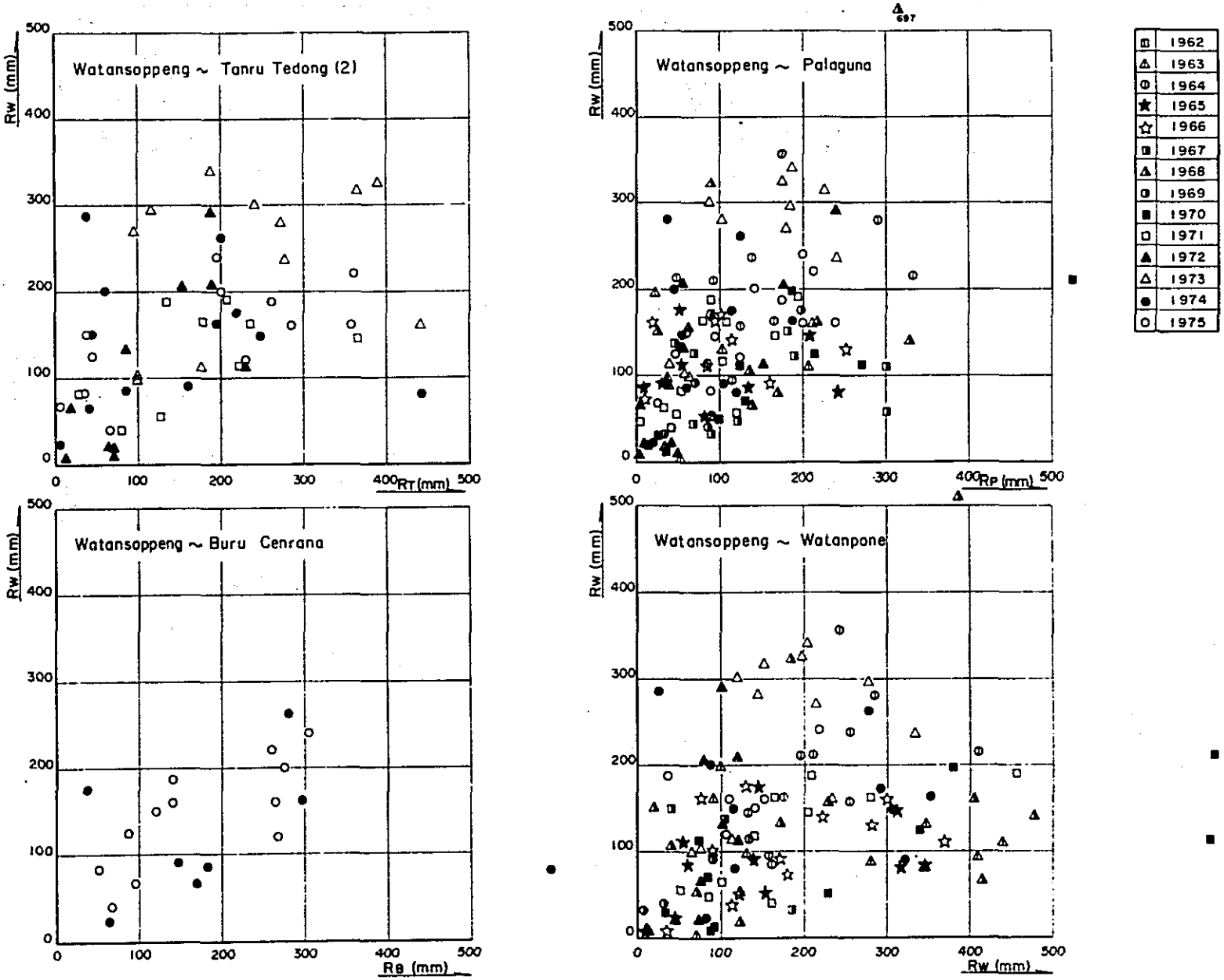


Fig. 9-6 MONTHLY RAINFALL CORRELATION

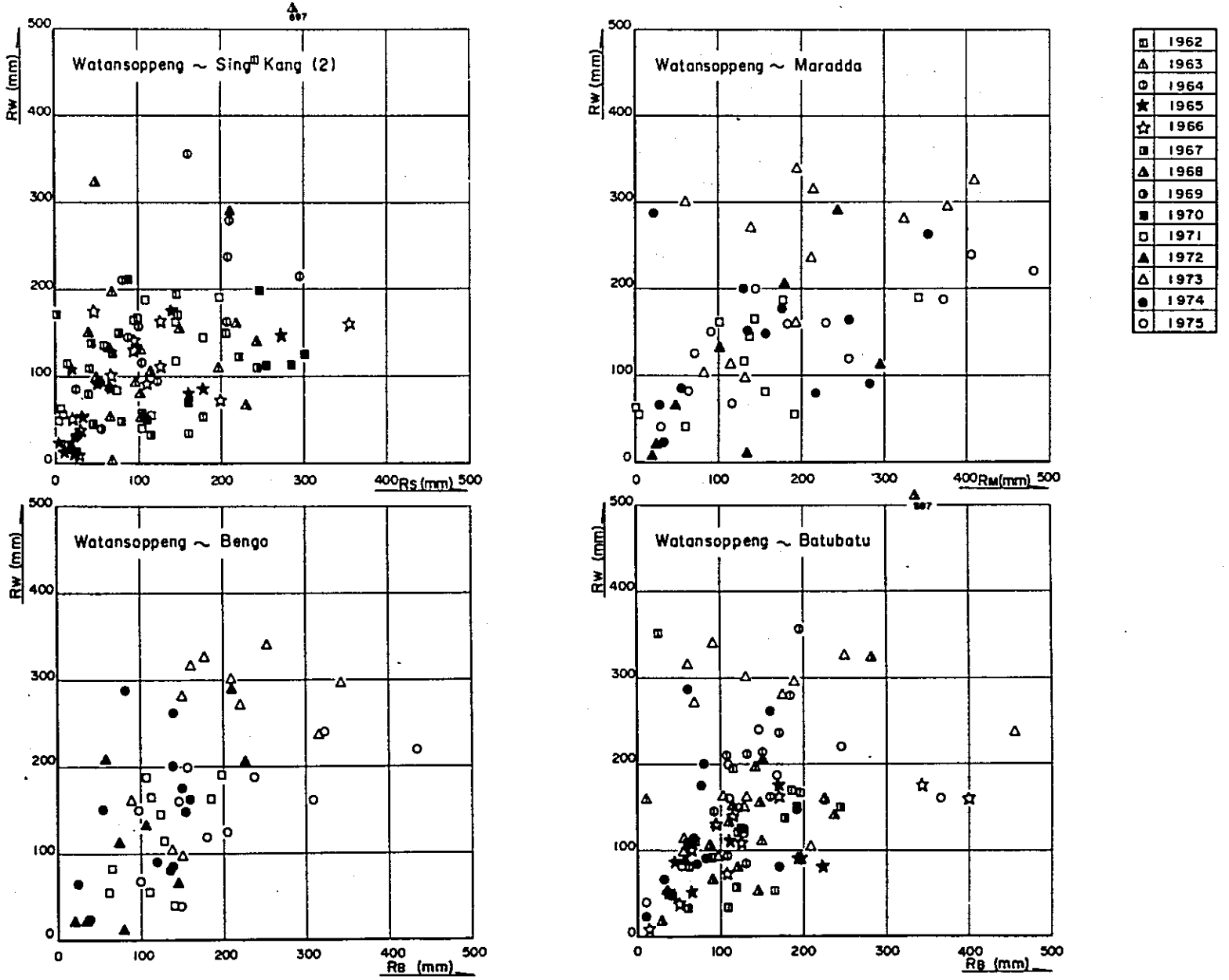


Fig. 9-7 MONTHLY RAINFALL CORRELATION

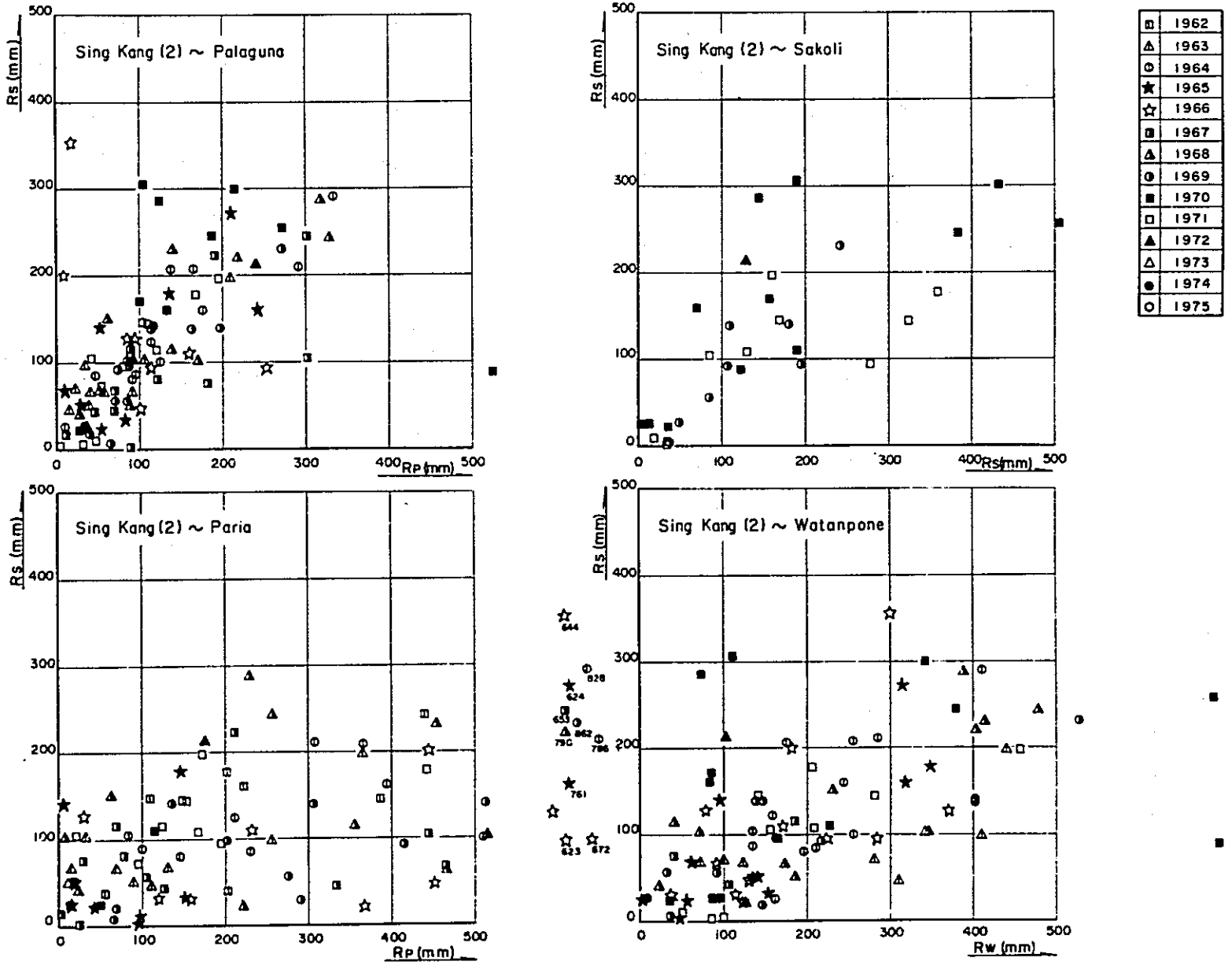


Fig. 9-8 MONTHLY RAINFALL CORRELATION

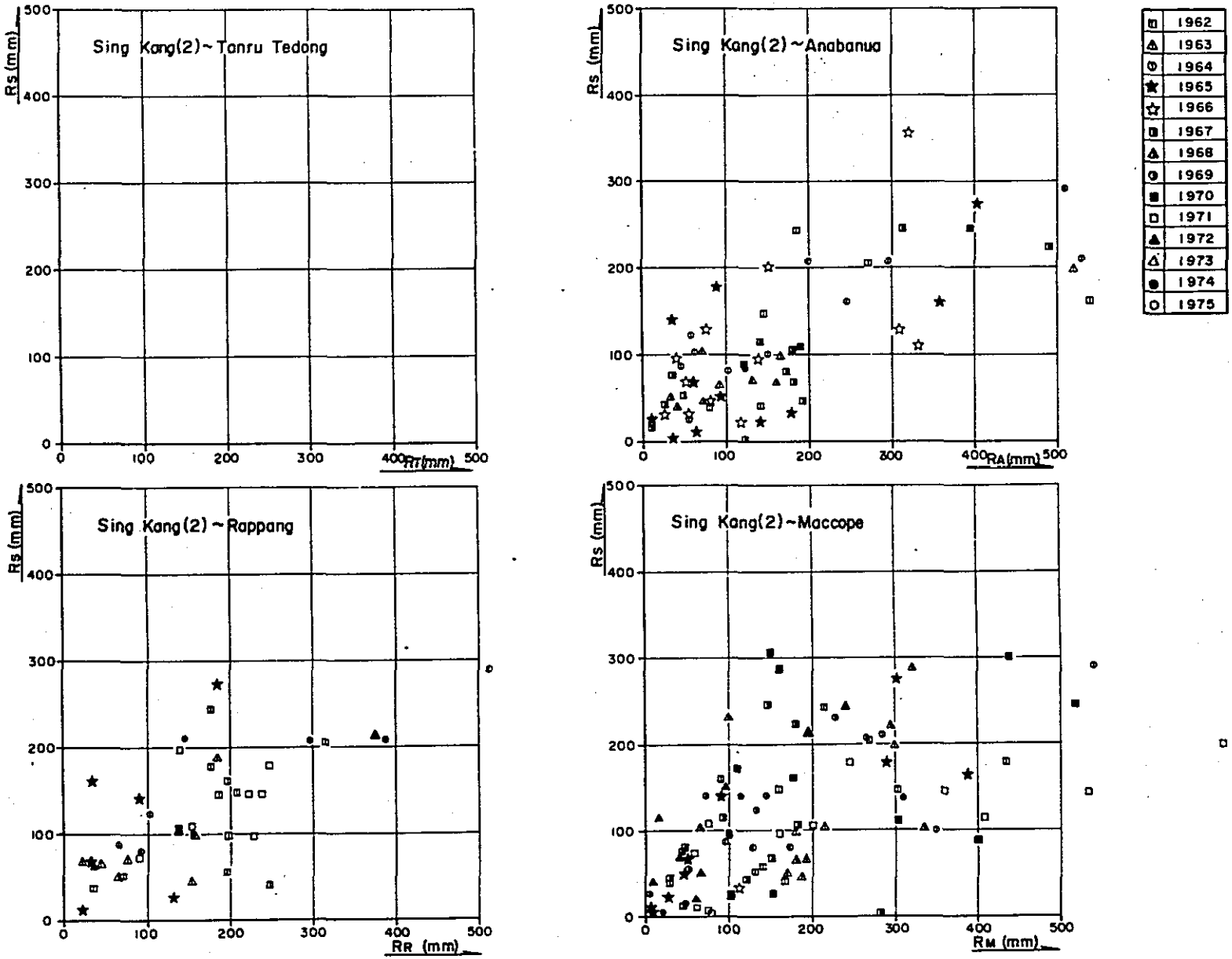


Fig. 9 - 9 MONTHLY RAINFALL CORRELATION

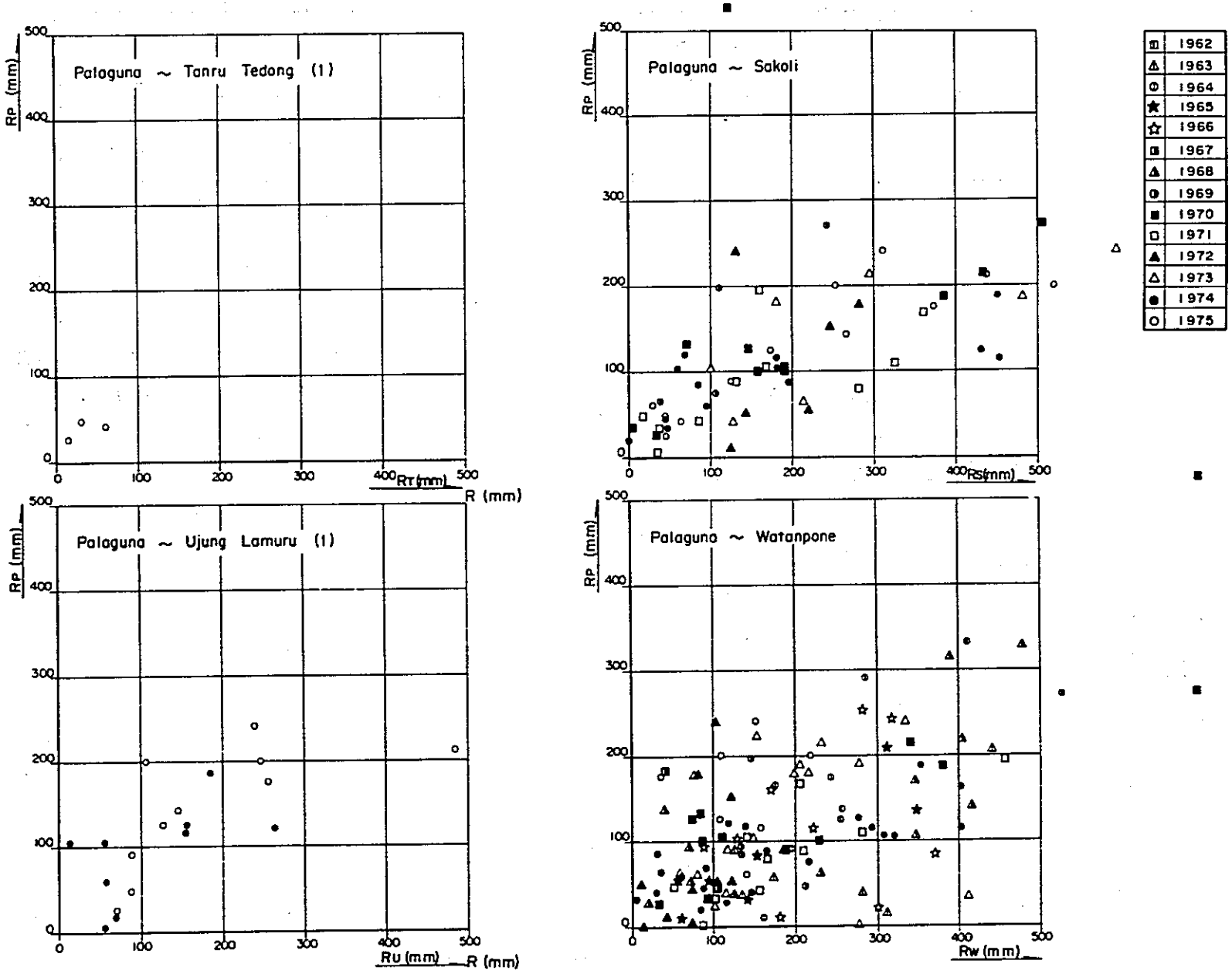


Fig. 9 - 10 MONTHLY RAINFALL CORRELATION

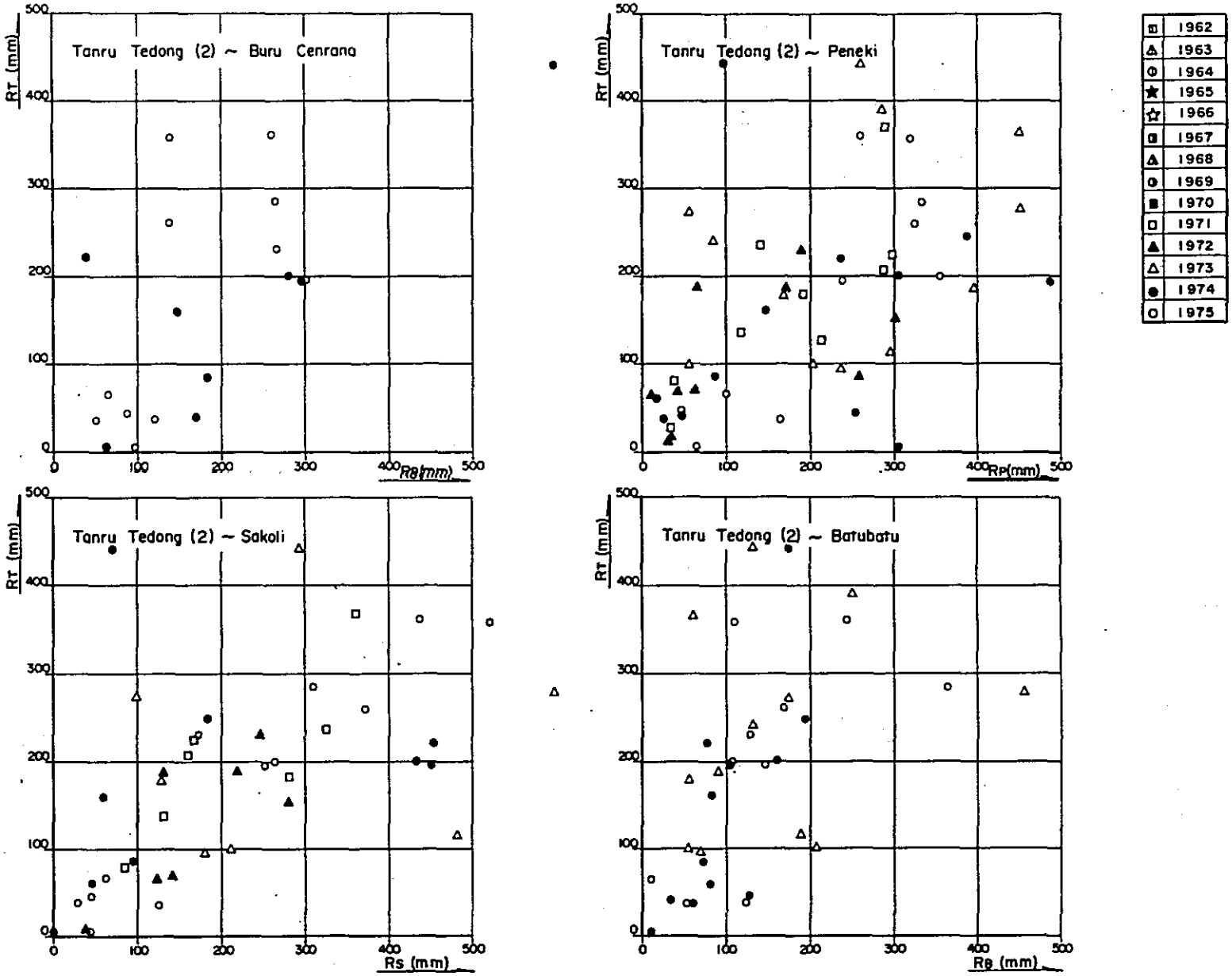


Fig. 9 - 11 MONTHLY RAINFALL CORRELATION

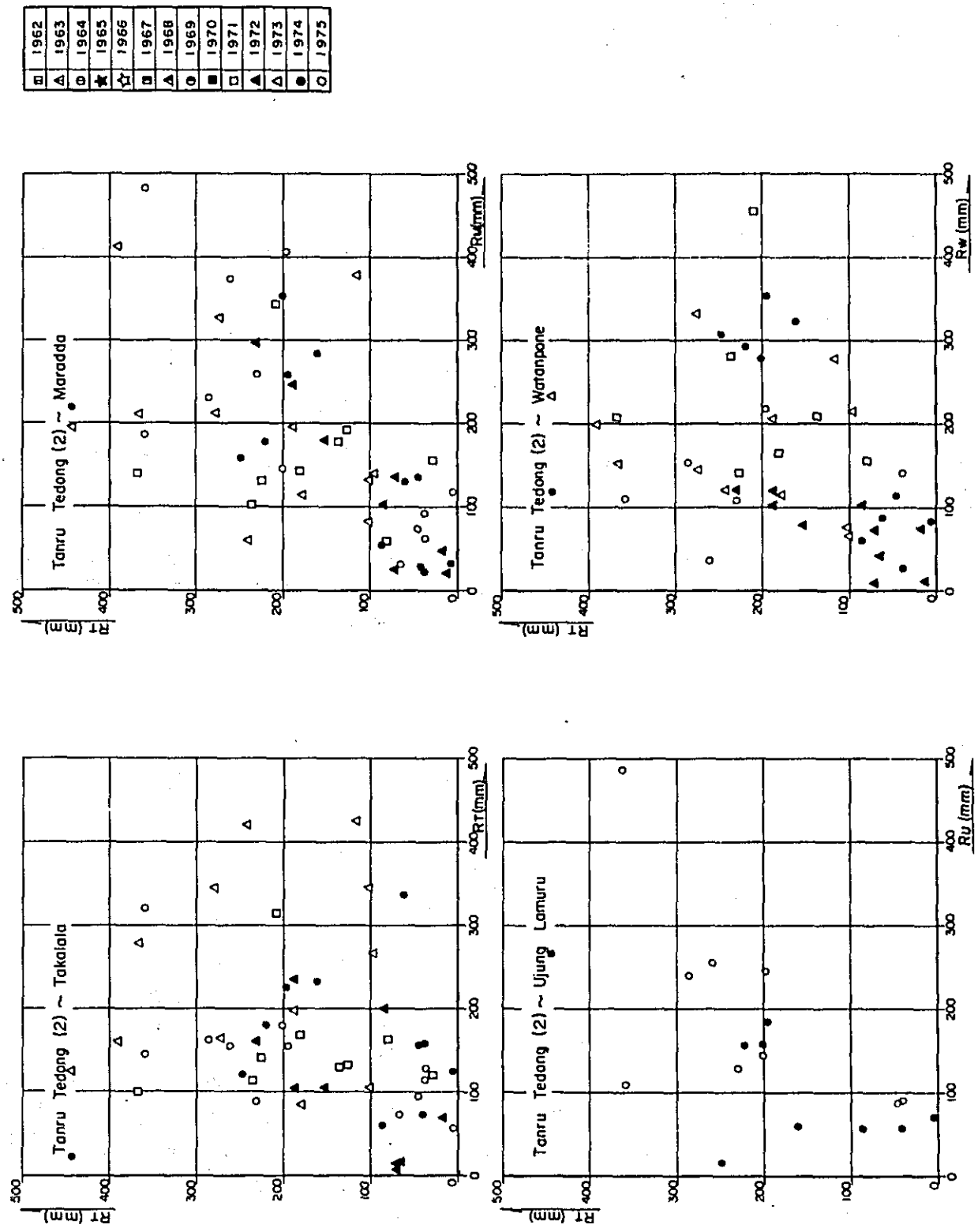


Fig. 9 - 12 MONTHLY RAINFALL CORRELATION

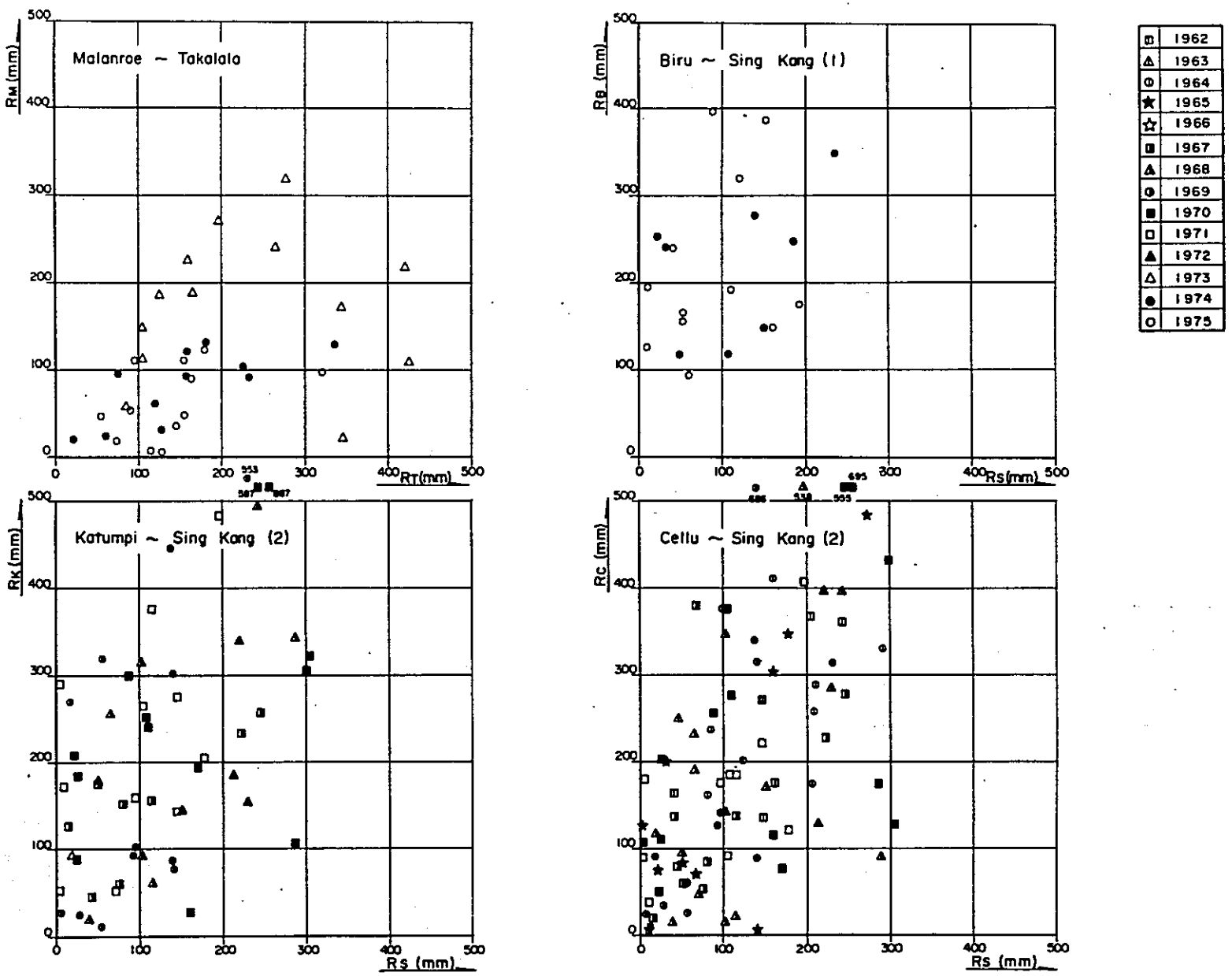


Fig. 9-13 MONTHLY RAINFALL CORRELATION

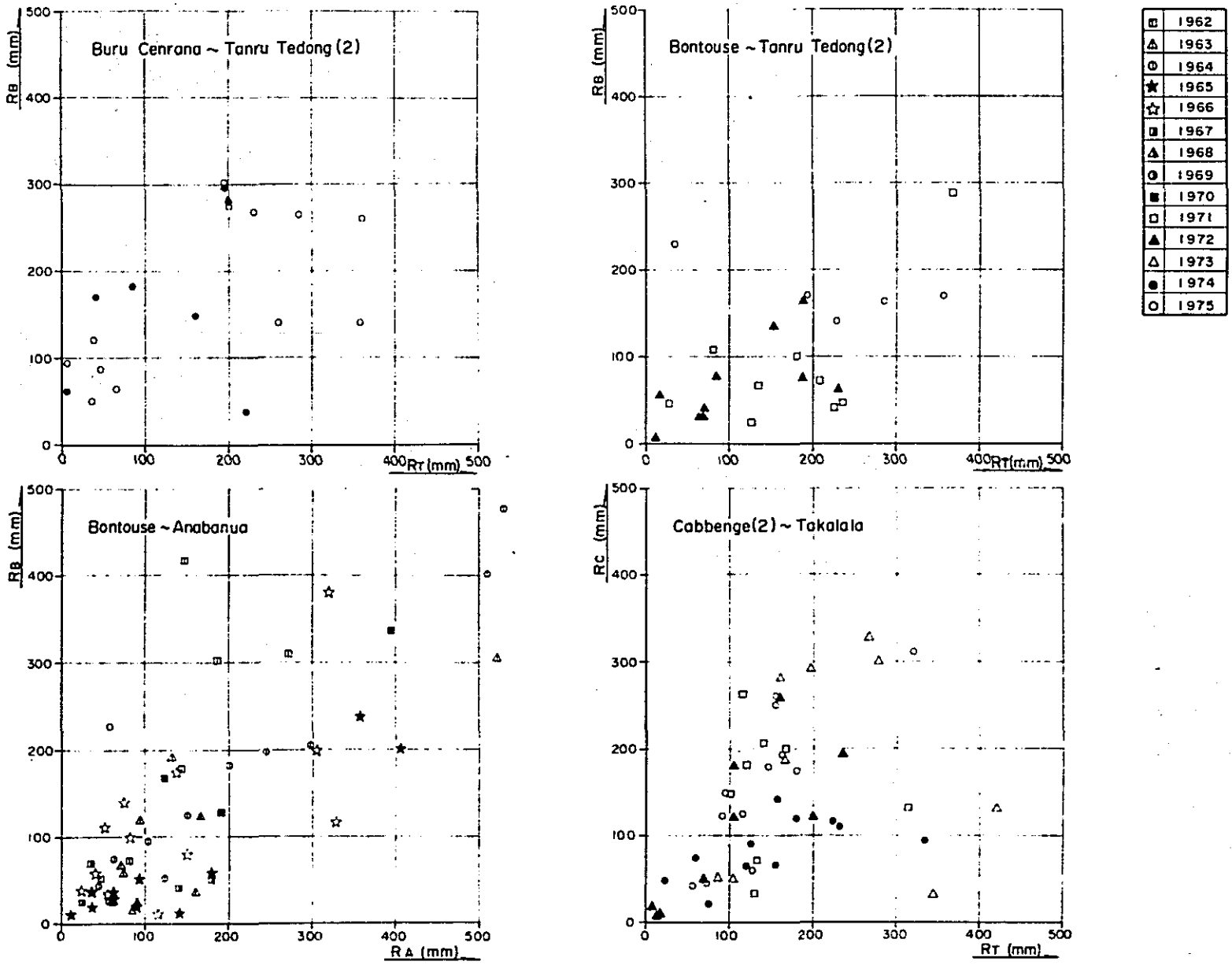


Fig. 9 - 14 MONTHILY RAINFALL CORRELATION

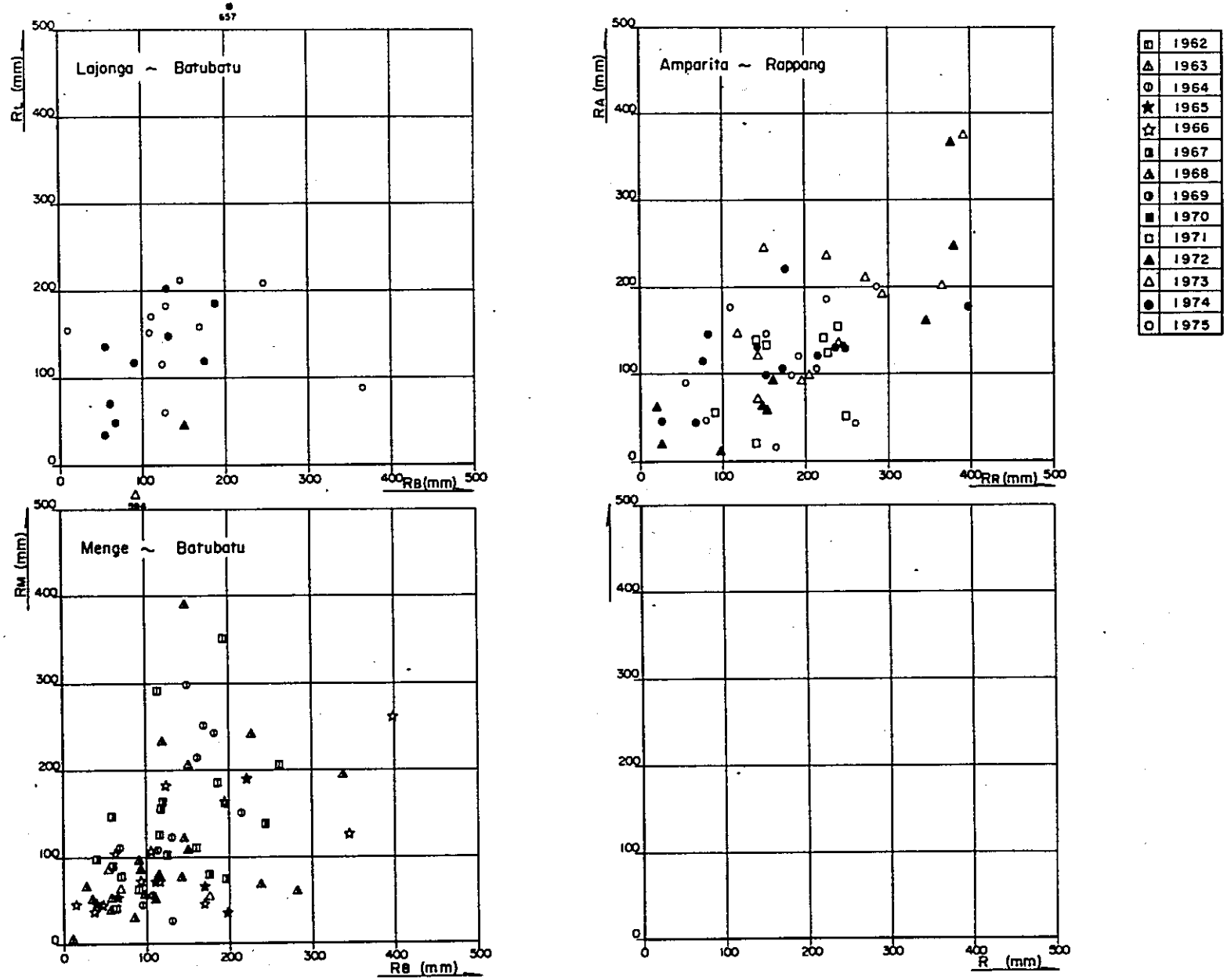


Fig. 10 HOURLY RAINFALL DISTRIBUTION

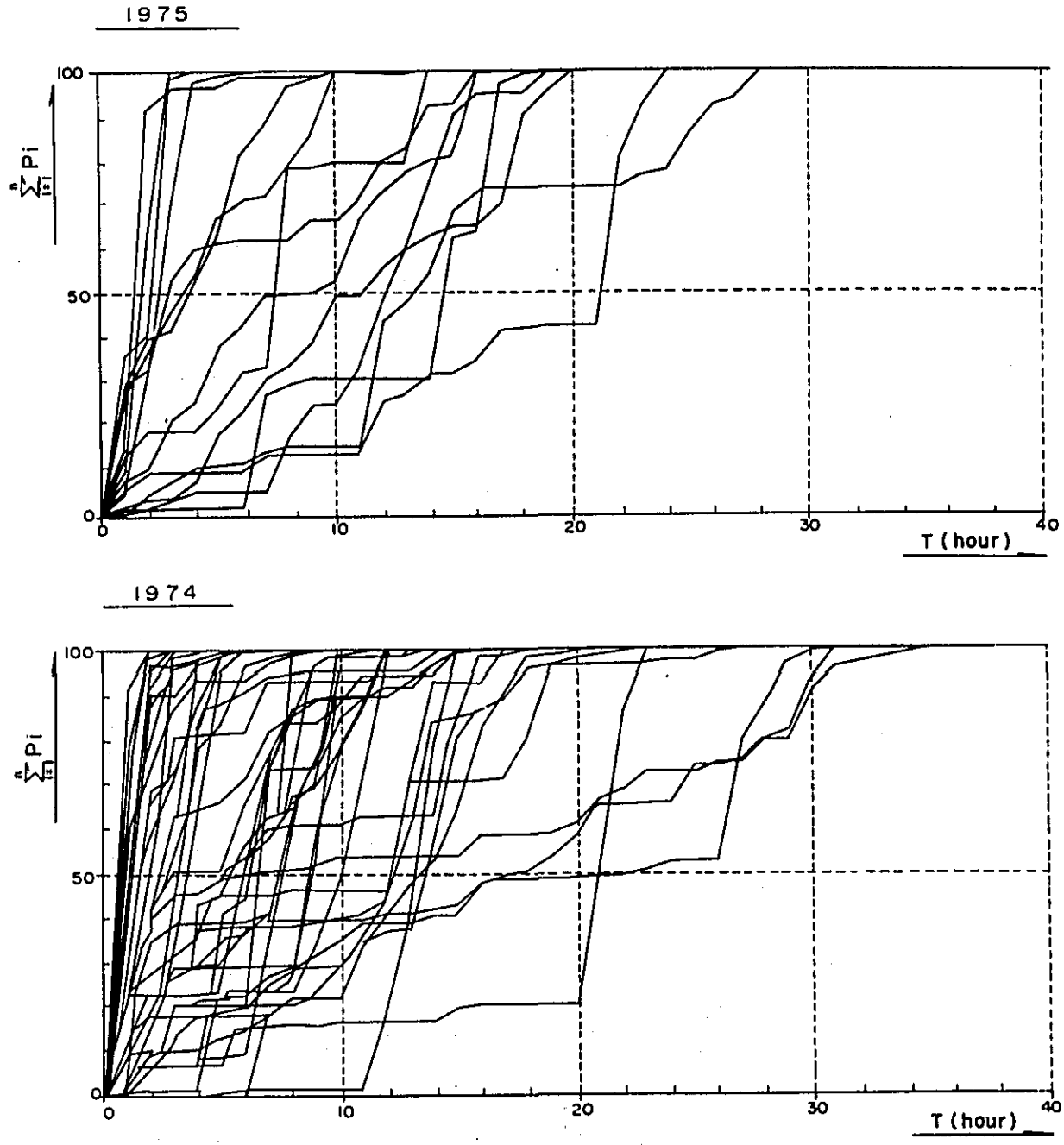


Table 10-1 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly Rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr)																							Remarks
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	
①	1975 7.19 - 7.20	Buru-Cenrana	①	13.0	5.0	4.0	4.0	7.0	1.5	0.5	3.0	-	0.5	-	-	10.0	-	0.1										48.6	
			②	26.8	10.3	8.2	8.2	14.4	3.1	1.0	6.2	-	1.0	-	-	20.6	-	0.2										100	
			③	26.8	37.1	45.3	53.5	67.9	71.0	72.0	78.2	-	79.2	-	-	99.8	-	100											
①	1975 7.21 - 7.22	Buru-Cenrana	①	9.5	1.0	11.5	9.0	0.6	-	0.3																		31.9	
			②	29.8	3.1	36.1	28.2	1.9	-	0.9																		100	
			③	29.8	32.9	69.0	97.2	99.1	-	100																			
①	1975 7.21 - 7.22	Camba	①	2.3	14.5	8.7	3.5	0.9	0.4	-	-	2.0	0.1	2.3	4.3	1.8	4.2	0.2	3.4	0.2								48.8	
			②	4.7	29.7	17.9	7.2	1.8	0.8	-	-	4.1	0.2	4.7	8.8	3.7	8.6	0.4	7.0	0.4								100	
			③	4.7	34.4	52.3	59.5	61.3	62.1	-	-	66.2	66.4	71.1	79.9	83.6	92.2	92.6	99.6	100									
①	1975 7.23 - 7.24	Buru-Cenrana	①	7.0	34.0	2.2	-	-	1.1	-	-	-	0.3	-	-	-	0.3											44.9	
			②	15.6	75.7	4.9	-	-	2.5	-	-	-	0.65	-	-	-	0.65											100	
			③	15.6	91.3	96.2	-	-	98.7	-	-	-	99.35	-	-	-	100												
①	1975. 7.29	Camba	①	2.7	12.8	9.2																						24.7	
			②	10.9	51.8	37.3																						100	
			③	10.9	62.7	100																							
②	1975 6.12 - 6.13	Buru-Cenrana	①	8.5	3.0	0.6	3.0	3.5	5.0	2.0	2 5	0.5	0.5															29.1	
			②	29.2	10.3	2.1	10.3	12.0	17.2	6.9	8.6	1.7	1.7															100	
			③	29.2	39.5	41.6	51.9	63.9	81.1	88.0	96.6	98.3	100																
②	1975 6.14 - 6.15	Ujung Lamuru	①	2.4	1.6	0.2	-	-	-	1.5	0.2	-	-	-	5.1	0.8	1.9	-	1.4	2.8	0.2	0.2	-	0.1	16.2	5.2	3.6	43.4	
			②	5.5	3.7	0.45	-	-	-	3.5	0.45	-	-	-	11.8	1.8	4.4	-	3.2	6.5	0.45	0.45	-	0.2	37.3	12.0	8.3	100	
			③	5.5	9.2	9.65	-	-	-	13.15	13.6	-	-	-	25.4	27.2	31.6	-	34.8	41.3	41.75	42.2	-	42.4	79.7	91.7	100		
②	1975 6.15 - 6.16	Camba	①	0.1	0.3	0.5	0.5	-	-	0.1	3.4	1.8	0.2	2.2	4.2	3.0	1.0	0.6	-	1.4	5.5	1.5	1.3					27.6	
			②	0.4	1.1	1.8	1.8	-	-	0.4	12.3	6.5	0.7	7.9	15.2	11.0	3.6	2.2	-	5.1	19.9	5.4	4.7					100	
			③	0.4	1.5	3.3	5.1	-	-	5.5	17.8	24.3	25.0	32.9	48.1	59.1	62.7	64.9	-	70.0	89.9	95.3	100						
②	1975. 6.17	Buru-Cenrana	①	4.0	1.5	-	-	1.5	2.2	0.5	13.0	2.0	4.2															28.9	
			②	13.8	5.2	-	-	5.2	7.6	1.7	45.0	6.95	14.55															100	
			③	13.8	19.0	-	-	24.2	31.8	33.5	78.5	85.45	100																
③	1975 5.26 - 5.27	Ujung Lamuru	①	10.5	1.5	16.8	0.5																					29.3	
			②	35.8	5.1	57.3	1.8																					100	
			③	35.8	40.9	98.2	100																						
③	1975. 5.28	Ujung Lamuru	①	1.3	1.2	0.1	2.4	7.6	3.2	4.8	2.3	3.3	7.2	-	4.1	2.9	11.4	9.0	3.4	0.2	-	3.2	0.2					67.8	
			②	1.9	1.8	0.2	3.5	11.2	4.7	7.1	3.4	4.9	10.6	-	6.0	4.3	16.8	13.3	5.0	0.3	-	4.7	0.3					100	
			③	1.9	3.7	3.9	7.4	18.6	23.3	30.4	33.8	38.7	49.3	-	55.3	59.6	76.4	89.7	94.7	95.0	-	99.7	100						
③	1975. 5.28	Camba	①	2.9	0.9	4.1	1.4	4.5	1.7	2.6	-	0.2	0.9	5.2	2.1	1.7	0.9	0.4	6.9	-	-	-	-	-	0.1			36.5	
			②	7.9	2.5	11.2	3.8	12.3	4.7	7.1	-	0.5	2.5	14.2	5.8	4.7	2.5	1.1	18.9	-	-	-	-	-	0.3			100	
			③	7.9	10.4	21.6	25.4	37.7	42.4	48.5	-	50.0	52.5	66.7	72.5	77.2	79.7	80.8	99.7	-	-	-	-	-	100				
④	1975. 5.5	Sing Kang	①	0.5	-	-	-	-	-	7.1	0.6	0.4	-	-	-	-	-	8.9	0.4	9.5	0.4	0.2						28.0	
			②	1.8	-	-	-	-	-	25.4	2.1	1.4	-	-	-	-	-	31.8	1.4	33.9	1.4	0.8						100	
			③	1.8	-	-	-	-	-	27.2	29.3	30.7	-	-	-	-	-	62.5	63.9	97.8	99.2	100							

Table 10-2 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly Rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr)																							Remarks
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	
④	1975 5.4 - 5.5	Ujung Lamuru	① ② ③	0.2 0.6 0.6	1.3 3.9 4.5	0.9 2.7 7.2	1.2 3.6 10.8	0.2 0.6 11.4	0.1 0.3 11.7	0.9 2.7 14.4	0.4 1.2 15.6	- - -	- - -	- - -	9.3 27.6 43.2	1.6 4.8 48.0	2.3 6.8 54.8	4.4 13.1 67.9	1.5 4.4 72.3	0.3 0.9 73.2	- - -	- - -	0.2 0.6 73.8	- - -	- - -	0.8 2.4 76.2	0.5 1.5 77.7		
			① ② ③	2.7 8.0 85.7	2.2 6.5 92.2	0.6 1.8 94.0	2.0 6.0 100																				33.6 100	
⑤	1974 9.28 - 9.29	Ujung Lamuru	① ② ③	17.5 29.1 29.1	23.6 39.3 68.4	2.0 3.3 71.7	9.0 15.0 86.7	0.6 1.0 87.7	1.5 2.5 90.2	2.1 3.5 93.7	0.7 1.2 94.5	0.1 0.2 95.1	- - -	- - -	- - -	- - -	3.0 4.9 100										60.1 100	
⑥	1974. 9.6	Buru-Cenrana	① ② ③	8.1 9.0 9.0	0.5 0.5 9.5	1.7 1.9 11.4	1.2 1.3 12.7	1.4 1.6 14.3	1.1 1.2 15.5	- - -	0.4 0.5 16.0	- - -	0.3 0.3 16.3	- - -	- - -	- - -	- - -	3.0 3.3 19.6	0.5 0.6 20.2	- - -	- - -	- - -	- - -	29.4 32.6 52.8	30.0 33.2 86.0	12.3 13.6 99.6	0.4 0.4 100	90.3 100	
⑥	1974. 9.5	Ujung Lamuru	① ② ③	0.4 1.0 1.0	1.4 3.3 4.3	- - -	3.6 8.6 12.9	14.2 33.8 46.7	4.0 9.5 56.2	8.3 19.8 76.0	3.2 7.6 83.6	- - -	1.6 3.8 87.4	2.8 6.6 94.0	- - -	- - -	- - -	2.5 6.0 100										42.0 100	
⑥	1974. 9.8	Buru-Cenrana	① ② ③	31.2 74.6 74.6	10.6 25.4 100																							41.8 100	
⑥	1974 9.9 - 9.10	Buru-Cenrana	① ② ③	20.9 22.8 22.8	- - -	- - -	- - -	0.5 0.5 23.3	- - -	- - -	- - -	9.8 10.7 34.0	13.3 14.5 48.5	20.2 22.0 70.5	23.4 25.6 96.1	2.7 3.1 99.2	0.7 0.8 100											91.5 100	
⑥	1974 9.7 - 9.9	Sing Kang	① ② ③	0.3 1.0 1.0	0.2 0.6 1.6	5.3 17.2 18.8	4.6 15.0 33.8	0.1 0.3 34.1	- - -	- - -	- - -	0.1 0.3 34.4	0.4 1.3 35.7	0.2 0.6 36.3	0.9 2.9 39.2	7.5 24.4 63.6	- - -	- - -	- - -	0.1 0.3 63.9	2.6 8.5 72.4	3.2 10.4 82.8	4.5 14.6 97.4	0.3 1.0 98.4	0.3 1.0 99.4	0.2 0.6 100		30.8 100	
⑥	1974 9.7 - 9.9	Sing Kang	① ② ③	0.5 2.2 2.2	5.3 22.9 25.1	0.3 1.3 26.4	0.6 2.6 29.0	0.1 0.4 29.4	1.8 7.8 37.2	0.9 3.9 41.1	6.0 26.0 67.1	0.6 2.6 69.7	1.8 7.8 77.5	2.2 9.5 87.0	2.9 12.6 99.6	0.1 0.4 100											23.1 100	
⑥	1974 9.10 - 9.11	Ujung Lamuru	① ② ③	3.8 14.0 14.0	1.1 4.0 18.0	- - -	- - -	- - -	- - -	- - -	0.4 1.5 19.5	11.0 40.4 59.9	4.6 16.9 76.8	2.8 10.3 87.1	2.8 10.3 97.4	0.7 2.6 100											27.2 100	
⑥	1974 9.11 - 9.12	Ujung Lamuru	① ② ③	8.4 23.8 23.8	1.3 3.7 27.5	1.3 3.7 31.2	1.6 4.5 35.7	- - -	0.2 0.6 36.3	0.5 1.4 37.7	12.2 34.6 72.3	9.6 27.2 99.5	0.1 0.25 99.75	0.1 0.25 100													35.3 100	
⑥	1974. 9.12	Buru-Cenrana	① ② ③	1.4 2.4 2.4	23.3 49.8 52.2	21.7 46.4 98.6	0.4 0.8 99.4	0.3 0.6 100																			47.1 100	
⑥	1974 9.11 - 9.12	Camba	① ② ③	4.3 9.0 9.0	1.0 2.1 11.1	0.8 1.7 12.8	12.5 26.0 38.8	4.9 10.2 49.0	3.0 6.2 55.2	3.4 7.1 62.3	0.9 1.9 64.2	5.5 11.4 75.6	11.2 23.2 98.8	- - 	- - 	- - 	0.6 1.2 100											48.1 100	

Table 10-3 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr)																								Remarks
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	
⑥	1974 9.12 - 9.14	Buru-Cenrana	①	8.9	0.2	-	-	-	21.2	20.8	-	-	-	-	1.4	0.2	1.6	0.8	6.8	1.4	-	-	-	0.4	0.3	1.4	2.5		
			②	6.8	0.2	-	-	-	16.3	16.0	-	-	-	-	1.1	0.2	1.2	0.6	5.2	1.1	-	-	-	0.3	0.2	1.1	1.9		
			③	6.8	7.0	-	-	-	23.3	39.3	-	-	-	-	40.4	40.6	41.8	42.4	47.6	48.7	-	-	-	49.0	49.2	50.3	52.2		
			①	0.4	-	35.6	10.6	11.5	4.0	-	-	-	-	-	0.1													130.1
			②	0.3	-	27.4	8.1	8.8	3.1	-	-	-	-	-	0.1													100
			③	52.5	-	79.9	88.0	96.8	99.9	-	-	-	-	-	100													
⑥	1974 9.14 - 9.15	Buru-Cenrama	①	0.3	6.0	2.5	-	-	-	-	-	1.5	2.4	2.4	0.9	0.4	8.3	10.3	2.9	1.0	4.2	-	0.5					43.6	
			②	0.7	13.8	5.7	-	-	-	-	-	3.4	5.5	5.5	2.1	0.9	19.0	23.6	6.7	2.3	9.6	-	1.2					100	
			③	0.7	14.5	20.2	-	-	-	-	-	23.6	29.1	34.6	36.7	37.6	56.6	80.2	86.9	89.2	98.8	-	100						
⑥	1974 9.13 - 9.14	Camba	①	1.9	3.9	7.9	16.6	6.0	0.1	-	-	-	0.1	-	-	-	-	0.1										36.6	
			②	5.2	10.7	21.6	45.4	16.4	0.3	-	-	-	0.2	-	-	-	-	0.2										100	
			③	5.2	15.9	37.5	82.9	99.3	99.6	-	-	-	99.8	-	-	-	-	100											
⑦	1974 8.7 - 8.8	Ujung Lamuru	①	2.2	9.3	1.3	9.4	1.6	3.6	0.5	0.3	0.2	-	-	-	-	0.1											28.5	
			②	7.7	32.6	4.6	33.0	5.6	12.6	1.8	1.1	0.7	-	-	-	-	0.3											100	
			③	7.7	40.3	44.9	77.9	83.5	96.1	97.9	99.0	99.7	-	-	-	-	100												
⑧	1974 7.14 - 7.15	Buru-Cenrana	①	0.1	1.4	1.0	1.0	14.5	6.2	8.0	5.0	5.5	1.5															44.2	
			②	0.2	3.2	2.3	2.3	32.8	14.0	18.1	11.3	12.4	3.4															100	
			③	0.2	3.4	5.7	8.0	40.8	54.8	72.9	84.2	96.6	100																
⑧	1974 7.16 - 7.17	Buru-Cenrana	①	1.0	1.0	6.0	6.5	18.5	3.0	4.0	0.4	0.3	-	1.2	-	-	-	18.0	6.0	-	1.0							66.9	
			②	1.5	1.5	8.9	9.8	27.7	4.5	6.0	0.6	0.4	-	1.8	-	-	-	26.9	8.9	-	1.5							100	
			③	1.5	3.0	11.9	21.7	49.4	53.9	59.9	60.5	60.9	-	62.7	-	-	-	89.6	98.5	-	100								
⑧	1974. 7.17	Sing Kang	①	1.0	3.0	1.2	3.0	1.4	-	2.0	0.9	-	0.2	3.0	3.7	6.7	10.3	0.4	6.2	0.2	0.2							43.4	
			②	2.3	6.9	2.8	6.9	3.2	-	4.6	2.1	-	0.5	6.9	8.5	15.4	23.7	0.9	14.3	0.5	0.5							100	
			③	2.3	9.2	12.0	18.9	22.1	-	26.7	28.8	-	29.3	36.2	44.7	60.1	83.8	84.7	99.0	99.5	100								
⑧	1974. 7.17	Ujung Lamuru	①	14.8	11.4	14.0	0.7	1.5	3.4	6.2	2.5	2.1	0.8	-	-	2.0	2.7	1.9	-	-	-	-	0.1					64.1	
			②	23.0	17.8	22.0	1.1	2.3	5.3	9.7	3.9	3.3	1.2	-	-	3.1	4.2	3.0	-	-	-	-	0.1					100	
			③	23.0	40.8	62.8	63.9	66.2	71.5	81.2	85.1	88.4	89.6	-	-	92.7	96.9	99.9	-	-	-	-	100						
⑧	1974 7.15 - 7.16	Sing Kang	①	2.4	9.7	11.6	0.3	-	0.1	3.5	-	-	-	-	0.4	1.6												29.6	
			②	8.1	32.8	39.2	1.0	-	0.3	11.8	-	-	-	-	1.4	5.4												100	
			③	8.1	40.9	80.1	81.1	-	81.4	93.2	-	-	-	-	94.6	100													
⑧	1974. 7.20	Sing Kang	①	1.6	-	4.4	0.3	0.1	-	15.1	0.1	-	3.3	1.2	3.4													29.5	
			②	5.4	-	14.9	1.0	0.3	-	51.2	0.3	-	11.3	4.1	11.5													100	
			③	5.4	-	20.3	21.3	21.6	-	72.8	73.1	-	84.4	88.5	100														
⑨	1974 6.18 - 6.20	Camba	①	0.4	14.8	2.4	0.2	1.3	0.3	0.3	-	0.5	0.7	-	-	-	-	-	1.9	-	-	-	0.9	1.7	-	0.1			
			②	1.0	37.9	6.1	0.5	3.3	0.8	0.8	-	1.3	1.8	-	-	-	-	-	4.9	-	-	-	2.3	4.3	-	0.2			
			③	1.0	38.9	45.0	45.5	48.8	49.6	50.4	-	51.7	53.5	-	-	-	-	-	58.4	-	-	-	60.7	65.0	-	65.2			
			①	3.4	-	0.5	1.8	0.7	4.7	2.5																		39.1	
			②	8.7	-	1.3	4.6	1.8	12.0	6.4																		100	
			③	73.9	-	75.2	79.8	81.6	93.6	100																			

Table 10-4 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly Rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	Remarks
⑨	1974. 6.20	Buru-Cenrana	①	9.5	9.0	2.0	0.2	-	-	1.3	31.0	0.5														53.5	
			②	17.8	16.8	3.7	0.4	-	-	2.4	57.9	1.0														100	
			③	17.8	34.6	38.3	38.7	-	-	41.1	99.0	100															
⑨	1974 6.24 - 6.25	Buru-Cenrana	①	2.2	10.0	2.6	-	-	4.4	3.0	3.0	0.7	-	0.1	0.7	-	1.5	0.8	0.2								29.2	
			②	7.5	34.2	8.9	-	-	15.1	10 3	10.3	2.4	-	0.3	2.4	-	5.1	2.7	0.8								100	
			③	7.5	41.7	50.6	-	-	65.7	76.0	86.3	88.7	-	89.0	91.4	-	96.5	99.2	100									
⑨	1974 6.26 - 6.27	Sing Kang	①	0.7	1.9	3.0	2.0	0.3	0.7	2.1	1.4	1.6	1.1	1.7	0.1	-	0.8	-	3.0	0.6	0.5	1.5	1.9	3.6	0.8	1.8	0.1		
			②	1.6	4.4	7.0	4.7	0.7	1.6	4.9	3.3	3.7	2.6	4.0	0.2	-	1.9	-	7.0	1.4	1.2	3.5	4.4	8.4	1.9	4.2	0.2		
			③	1.6	6.0	13.0	17.7	18.4	20.0	24.9	28.2	31.9	34.5	38.5	38.7	-	40.6	-	47.6	49.0	50.2	53.7	58.1	66.5	68.4	72.6	72.8		
			①	-	0.8	-	2.3	-	4.6	2.3	0.3	0.5	0.4	0.6													43.0	
			②	-	1.9	-	5.3	-	10.7	5.3	0.7	1.2	0.9	1.4													100	
			③	-	74.5	-	79.8	-	90.5	95.8	96.5	97.7	98.6	100														
⑩	1974 5.15 - 5.16	Ujung Lamuru	①	0.2	22.7	2.6	9.0																			34.5	
			②	0.6	65.8	7.5	26.1																			100	
			③	0.6	66.4	73.9	100																				
⑫	1974 12.24 - 12.25	Buru-Cenrana	①	11.0	1.5	28.0	35.5	36.0	6.2																	118.2	
			②	9.3	1.3	23.7	30.0	30.5	5.2																	100	
			③	9.3	10.6	34.3	64.3	94.8	100																		
⑫	1974 12.27 - 12.28	Camba	①	0.4	3.0	1.5	0.3	1.2	0.8	1.6	1.9	-	-	5.7	3.1	3.3	2.7	6.2	8.4	3.8	2.8	0.4	-	-	-	0.1	0.4		
			②	0.8	6.1	3.1	0.6	2.5	1.6	3.3	3.9	-	-	11.6	6.3	6.7	5.5	12.7	17.2	7.8	5.7	0.8	-	-	-	0.2	0.8		
			③	0.8	6.9	10.0	10.6	13.1	14.7	18.0	21.9	-	-	33.5	39.8	46.5	52.0	64.7	81.9	89.7	95.4	96.2	-	-	-	96.4	97.2		
			①	0.1	0.2	0.7	0.4																			48.8	
			②	0.2	0.4	1.4	0.8																			100	
			③	97.4	97.8	99.2	100																				
⑫	1974. 12.30	Camba	①	3.5	20.0	5.2	7.0	4.1	0.6																	40.4	
			②	8.7	49.5	12.9	17.3	10.1	1.5																	100	
			③	8.7	58.2	71.1	88.4	98.5	100																		
⑭	1974. 12.1	Buru-Cenrama	①	0.9	18.5	4.0	0.3	0.7																		24.4	
			②	3.7	75.8	16.4	1.2	2.9																		100	
			③	3.7	79.5	95.9	97.1	100																			
⑮	1974. 11.6	Camba	①	24.5	10.8																					35.3	
			②	69.4	30.6																					100	
			③	69.4	100																						
⑮	1974. 11.9	Buru-Cenrana	①	28.7	17.5	5.5	3.3	-	-	1.7	1.0	0.5	0.2													58.4	
			②	49.1	30.0	9.4	5.7	-	-	2.9	1.7	0.9	0.3													100	
			③	49.1	79.1	88.5	94.2	-	-	97.1	98.8	99.7	100														
⑮	1974. 11.9	Sing Kang	①	9.2	16.4	-	2.0	0.9																		28.5	
			②	32.3	57.5	-	7.0	3.2																		100	
			③	32.3	89.8	-	96.8	100																			

Table 10-5 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly Rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	Remarks
⑭	1974. 11.9	Cabbenge	①	6.6	16.9	-	0.4	0.4	-	-	-	-	0.1														24.4
			②	27.0	69.3	-	1.6	1.6	-	-	-	-	0.5														100
			③	27.0	96.3	-	97.9	99.5	-	-	-	-	100														
⑮	1974. 11.9	Camba	①	10.2	11.0	2.1																					23.3
			②	43.8	47.2	9.0																					100
			③	43.8	91.0	100																					
⑮	1974. 11.14	Sing Kang	①	4.7	4.9	0.2	25.0	7.0	0.3	0.2																	42.3
			②	11.1	11.6	0.5	59.1	16.5	0.7	0.5																	100
			③	11.1	22.7	23.2	82.3	98.8	99.5	100																	
⑮	1974. 11.14	Buru-Cenrana	①	30.0	3.0																						33.0
			②	91.0	9.0																						100
			③	91.0	100																						
⑯	1974 10.13 - 10.14	Ujung Lamuru	①	0.7	0.1	-	14.1	0.8	-	-.	0.4	-	-	-	-	7.6	8.7	-	-	2.5							34.9
			②	2.0	0.3	-	40.4	2.3	-	-	1.1	-	-	-	-	21.8	24.9	-	-	7.2							100
			③	2.0	2.3	-	42.7	45.0	-	-	46.1	-	-	-	-	67.9	92.8	-	-	100							
⑯	1974. 10.16	Buru-Cenrana	①	20.5	5.0	12.5	29.0	1.5																			68.5
			②	29.9	7.3	18.2	42.3	2.3																			100
			③	29.9	37.2	55.4	97.7	100																			
⑯	1974. 10.16	Ujung Lamuru	①	9.4	14.5	1.2	0.1																				25.2
			②	37.3	57.5	4.8	0.4																				100
			③	37.3	94.8	99.6	100																				
⑯	1974 10.17 - 10.18	Buru-Cenrana	①	15.0	12.0	2.5	1.2	0.2																			30.9
			②	48.5	38.8	8.1	3.9	0.7																			100
			③	48.5	87.3	95.4	99.3	100																			
⑯	1974 10.17 - 10.18	Sing Kang	①	2.8	5.9	11.2	0.3																				20.2
			②	13.9	29.2	55.4	1.5																				100
			③	13.9	43.1	98.5	100																				
⑯	1974 10.17 - 10.18	Ujung Lamuru	①	0.4	2.1	0.1	0.4	-	0.4	9.7	10.3	3.9	7.0	2.1													36.4
			②	1.1	5.8	0.3	1.1	-	1.1	26.6	28.3	10.7	19.2	5.8													100
			③	1.1	6.9	7.2	8.3	-	9.4	36.0	64.3	75.0	94.2	100													
⑯	1974 10.17 - 10.18	Camba	①	0.3	0.3	0.1	-	12.3	12.2	2.0	3.6	2.3	13.9														47.0
			②	0.6	0.6	0.2	-	26.2	26.0	4.3	7.7	4.9	29.5														100
			③	0.6	1.2	1.4	-	27.6	53.6	57.9	65.6	70.5	100														
⑯	1974 10.18 - 10.19	Buru-Cenrana	①	1.7	5.0	5.7	-	-	-	-	-	10.5	19.0	0.7													42.6
			②	4.0	11.7	13.4	-	-	-	-	-	24.6	44.6	1.7													100
			③	4.0	15.7	29.1	-	-	-	-	-	53.7	98.3	100													
⑯	1974 10.18 - 10.19	Sing Kang	①	0.1	-	-	-	-	-	4.9	1.7	7.8	5.0	5.1	0.2												24.8
			②	0.4	-	-	-	-	-	19.7	6.8	31.5	20.2	20.6	0.8												100
			③	0.4	-	-	-	-	-	20.1	26.9	58.4	78.6	99.2	100												

Table 10-6 HOURLY RAINFALL DISTRIBUTION

Flood No.	Date	Observation Station		Hourly Rainfall (r) and Hourly Rainfall Distribution Ratio (r/Σr) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	Remarks
⑯	1974. 10.21	Sing Kang	①	27.4	7.9																							35.3
			②	77.6	22.4																							100
			③	77.6	100																							
⑯	1974. 10.21	Camba	①	4.0	45.0	5.6	-	0.1																				54.7
			②	7.3	82.3	10.2	-	0.2																				100
			③	7.3	89.6	99.8	-	100																				
⑯	1974. 10.23	Camba	①	4.5	23.4	0.5																						28.4
			②	15.8	82.4	1.8																						100
			③	15.8	98.2	100																						
⑰	1974 7.12 - 7.13	Buru-Cenrana	①	0.3	-	-	-	-	0.5	0.2	-	-	-	-	10.5	12.7	23.0	12.0	0.3									59.5
			②	0.5	-	-	-	-	0.8	0.3	-	-	-	-	17.6	21.3	38.7	20.2	0.6									100
			③	0.5	-	-	-	-	1.3	1.6	-	-	-	-	19.2	40.5	79.2	99.4	100									

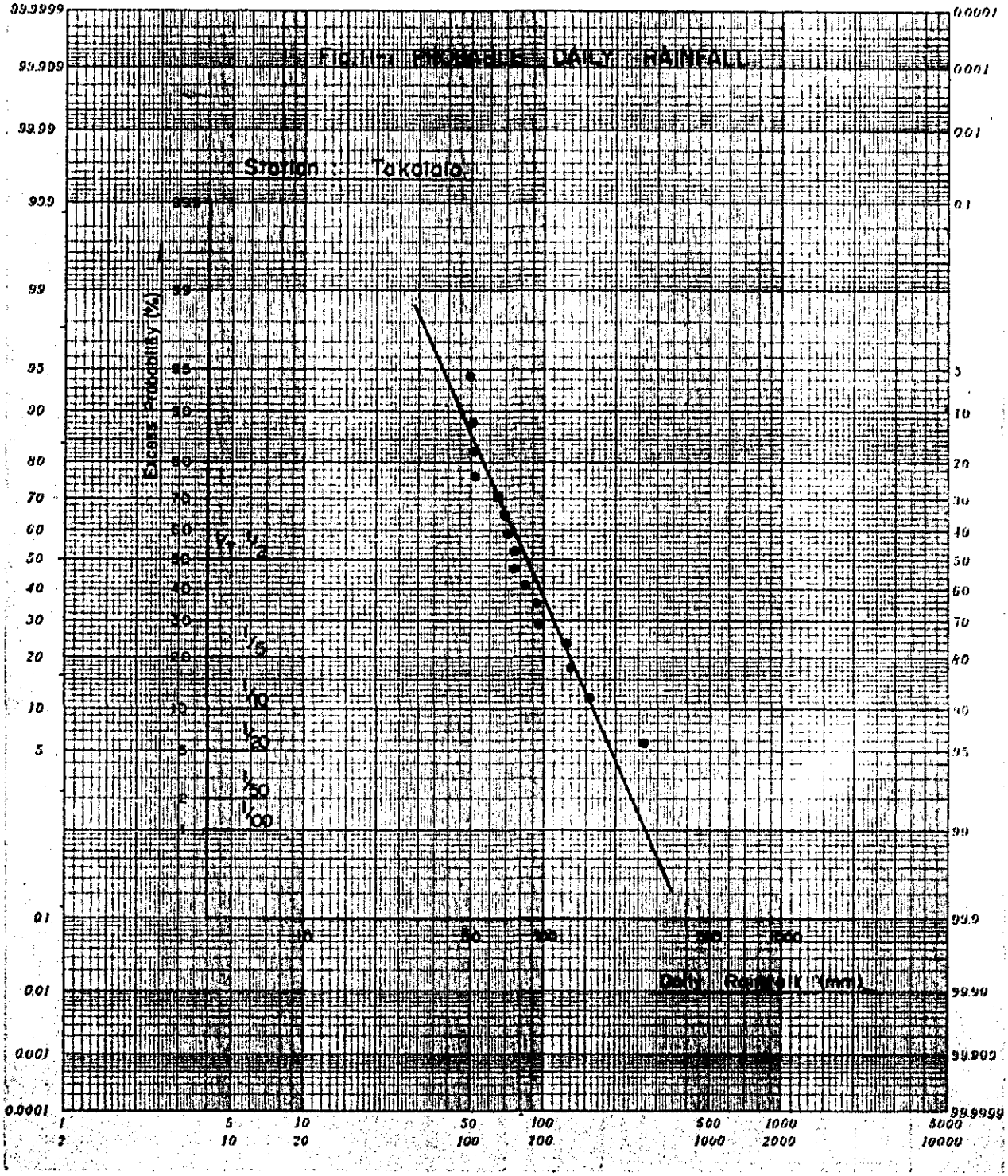
* In table 10, mark ① ② ③ are as follow,

  ① ; Hourly Rainfall (r ; mm), ② ; Percentage between Hourly Rainfall and Total Rainfall $(Pi\,(\%) = \frac{ri}{\sum_{i=1}^{n} r_i} \times 100)$

  ② ; Accumulation percentage of Hourly Rainfall $(\sum_{i=1}^{n} Pi)$

* Only Rainfall which is above 25 mm is taken into consideration as single rainfall.

* Each rainfall is separated by six hours from off-time of one rainfall to on-time of the immediate next.


Station : Takatafo
Daily Rainfall (mm)
Excess Probability (%)
99.9999
99.999
99.99
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.01
0.001
0.0001
1/2
1/5
1/10
1/20
1/50
1/100
1
2
5
10
20
50
100
200
500
1000
2000
5000
10000

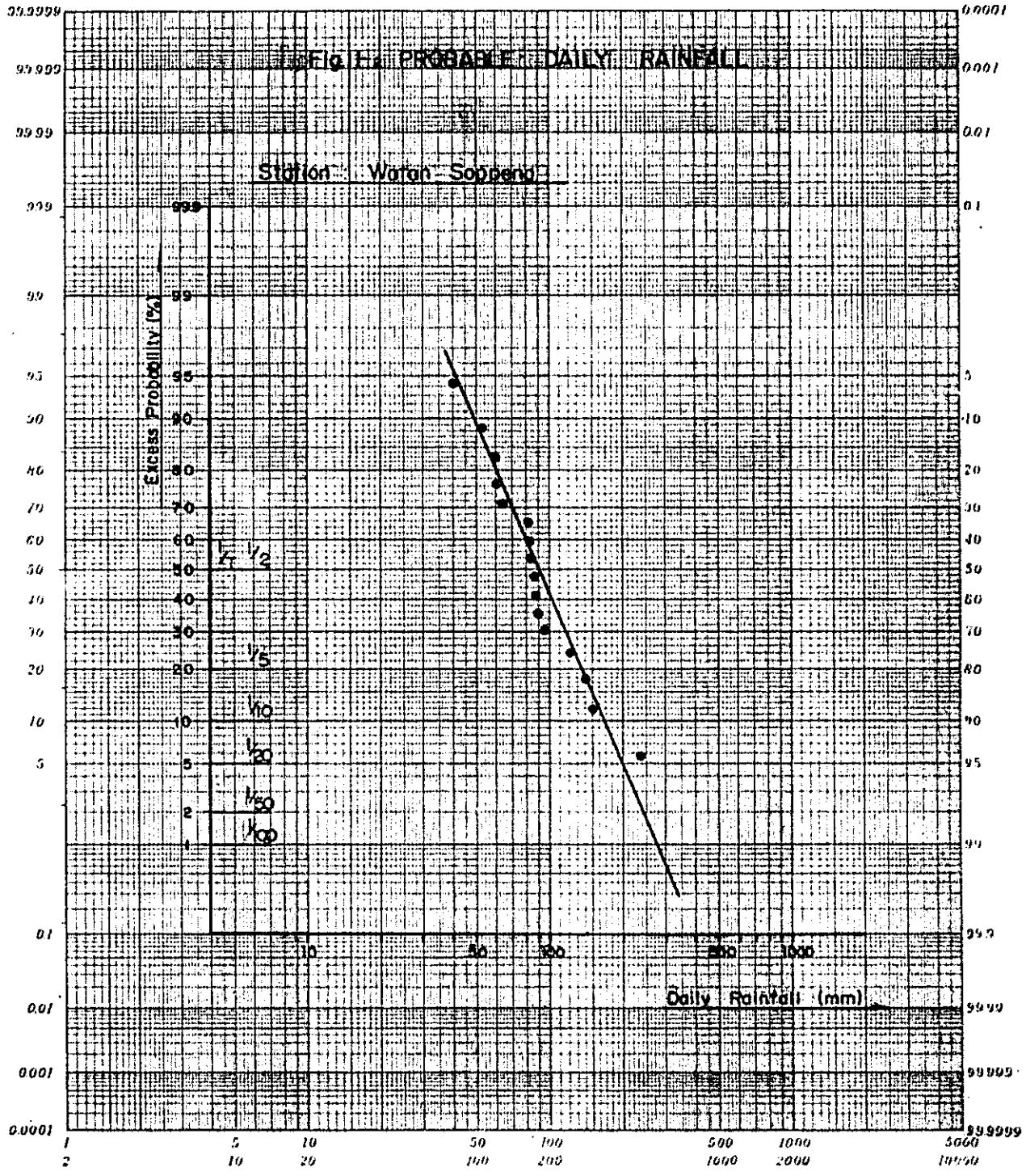
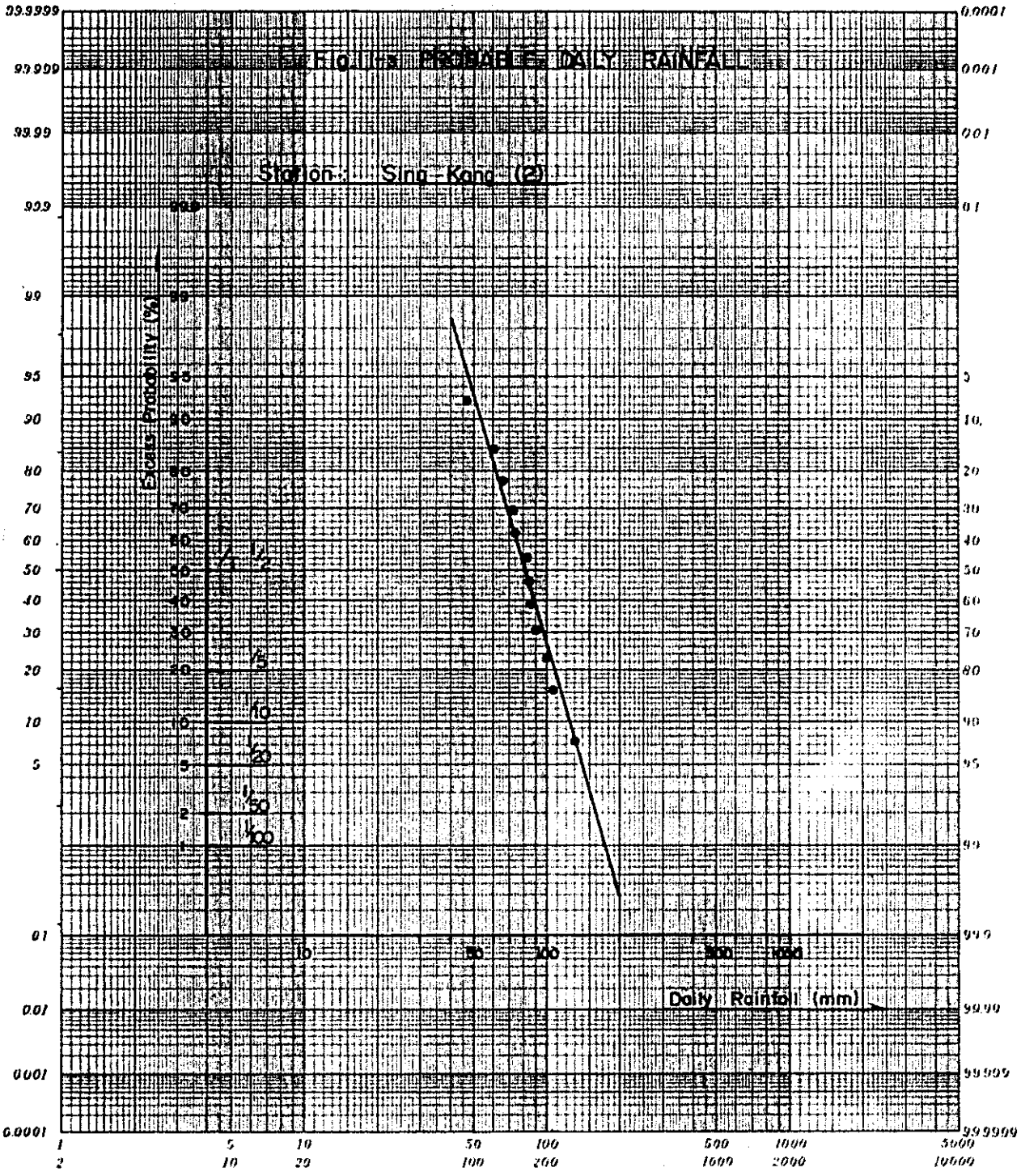


Fig. 1.2 PROBABLE DAILY RAINFALL
Station : Watan Soppeng
Excess Probability (%)
1/2
1/5
1/10
1/20
1/50
1/100
Daily Rainfall (mm)


Station: Sing-Kang (2)
Excess Probability (%)
Daily Rainfall (mm)

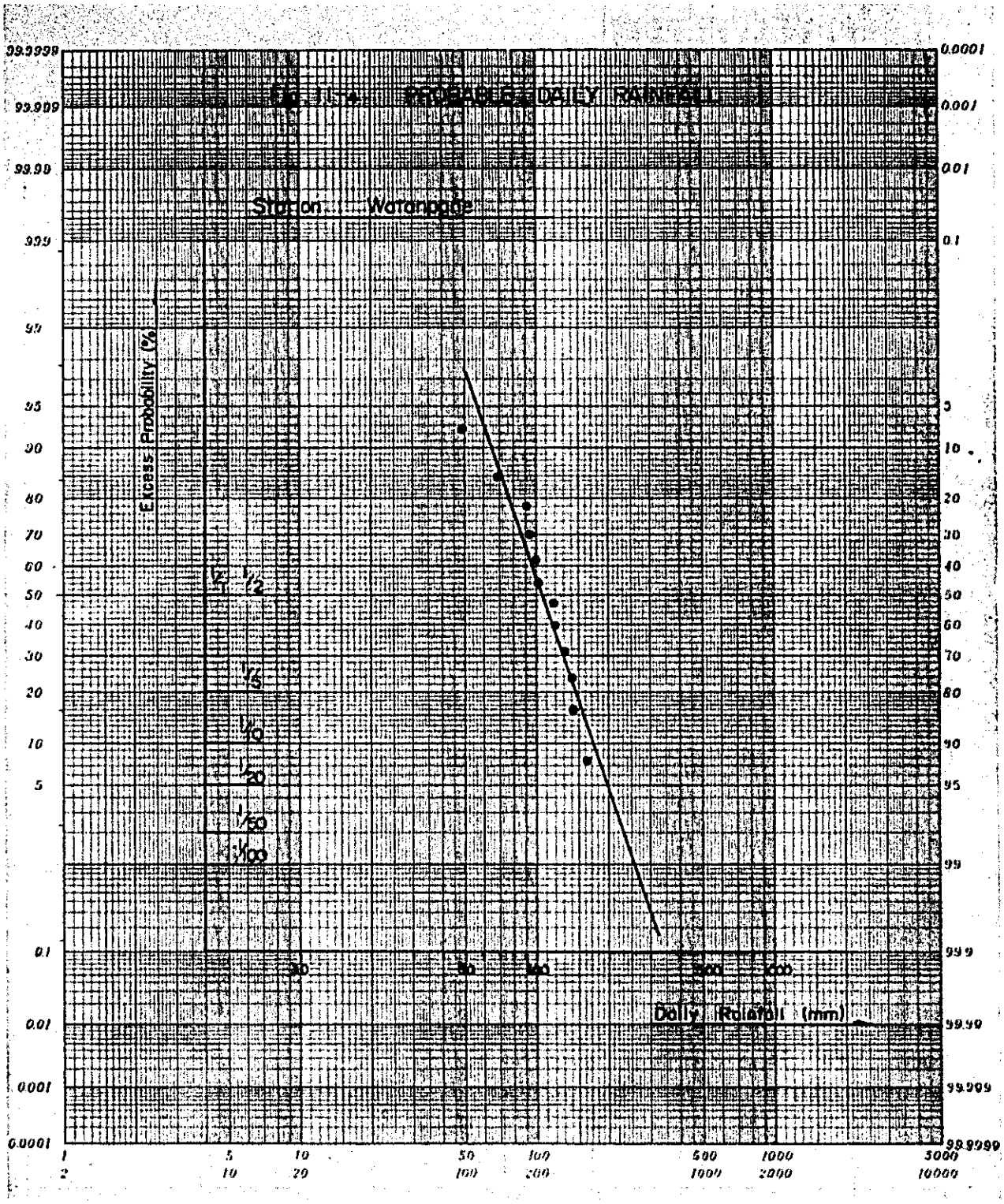

FIJI : PROBABLE DAILY RAINFALL
Station Watanpage
Excess Probability (%)
Daily Rainfall (mm)
99.9999
99.999
99.99
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
0.01
0.001
0.0001
1/2
1/5
1/10
1/20
1/50
1/100
1
2
5
10
20
50
100
200
500
1000
2000
5000
10000

Fig. 12 - 1 DAILY WATER STAGE CORRELATION

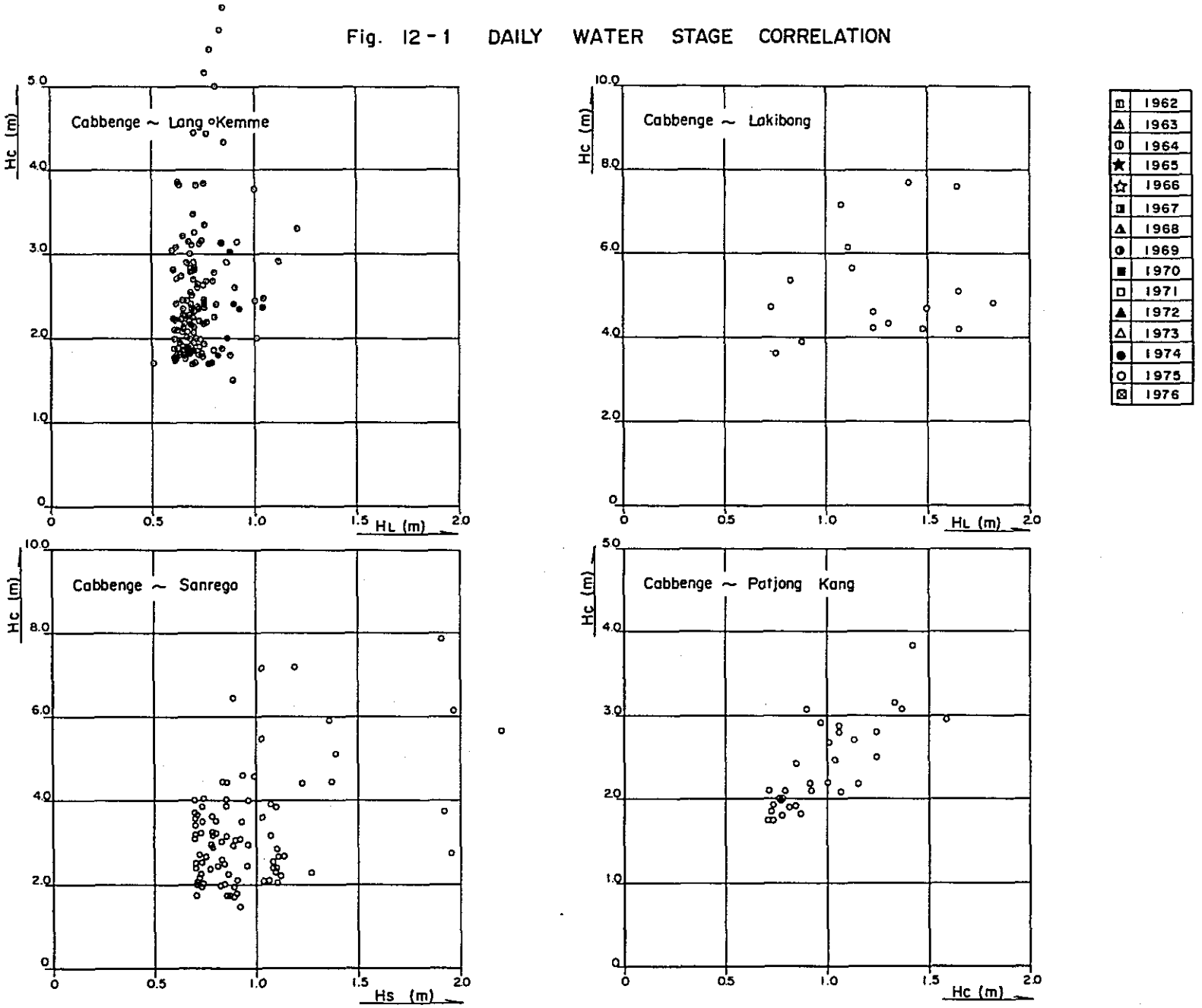


Fig. 12-2 DAILY WATER STAGE CORRELATION

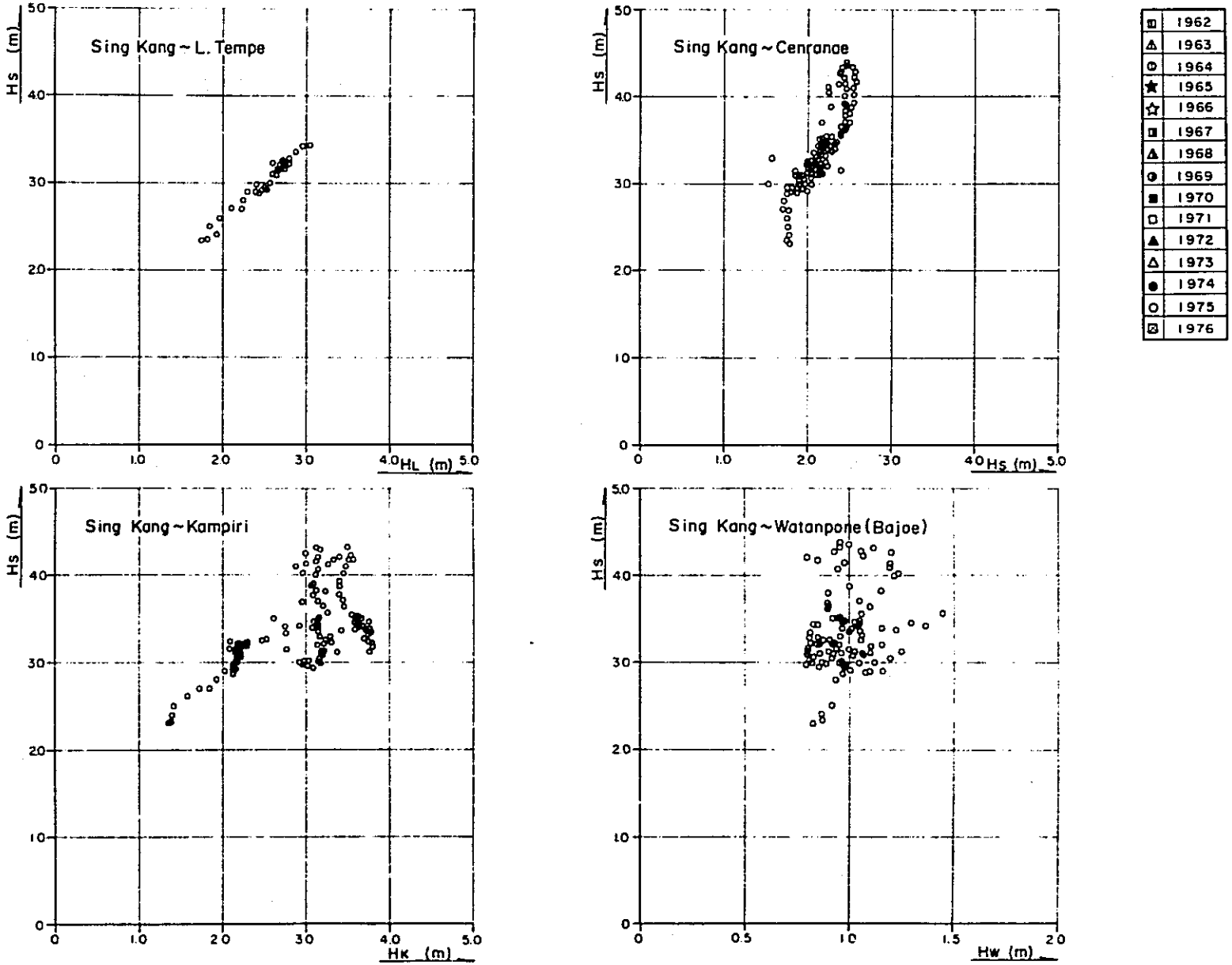


Fig. 12-3 DAILY WATER STAGE CORRELATION

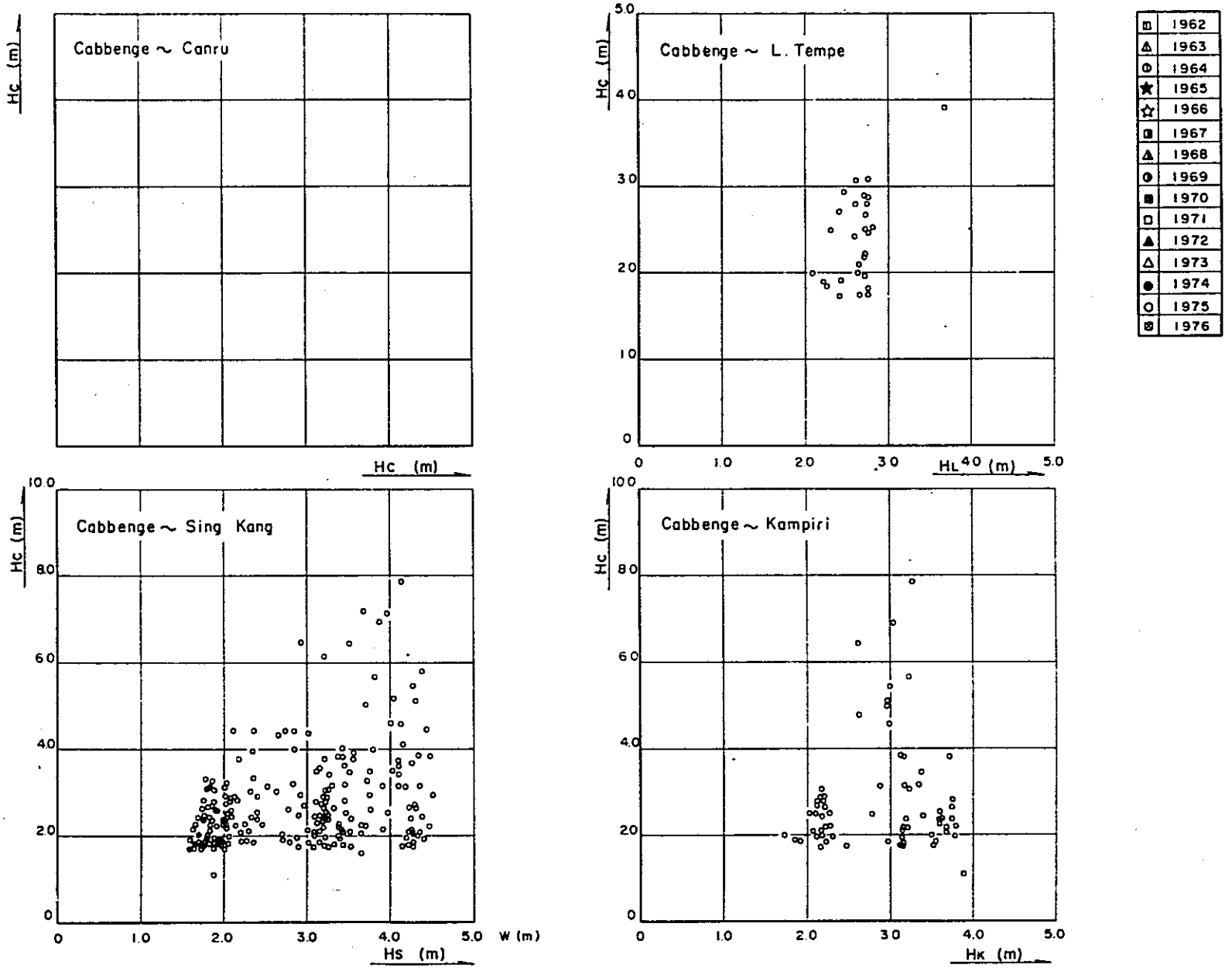


Fig. 12-4 DAILY WATER STAGE CORRELATION

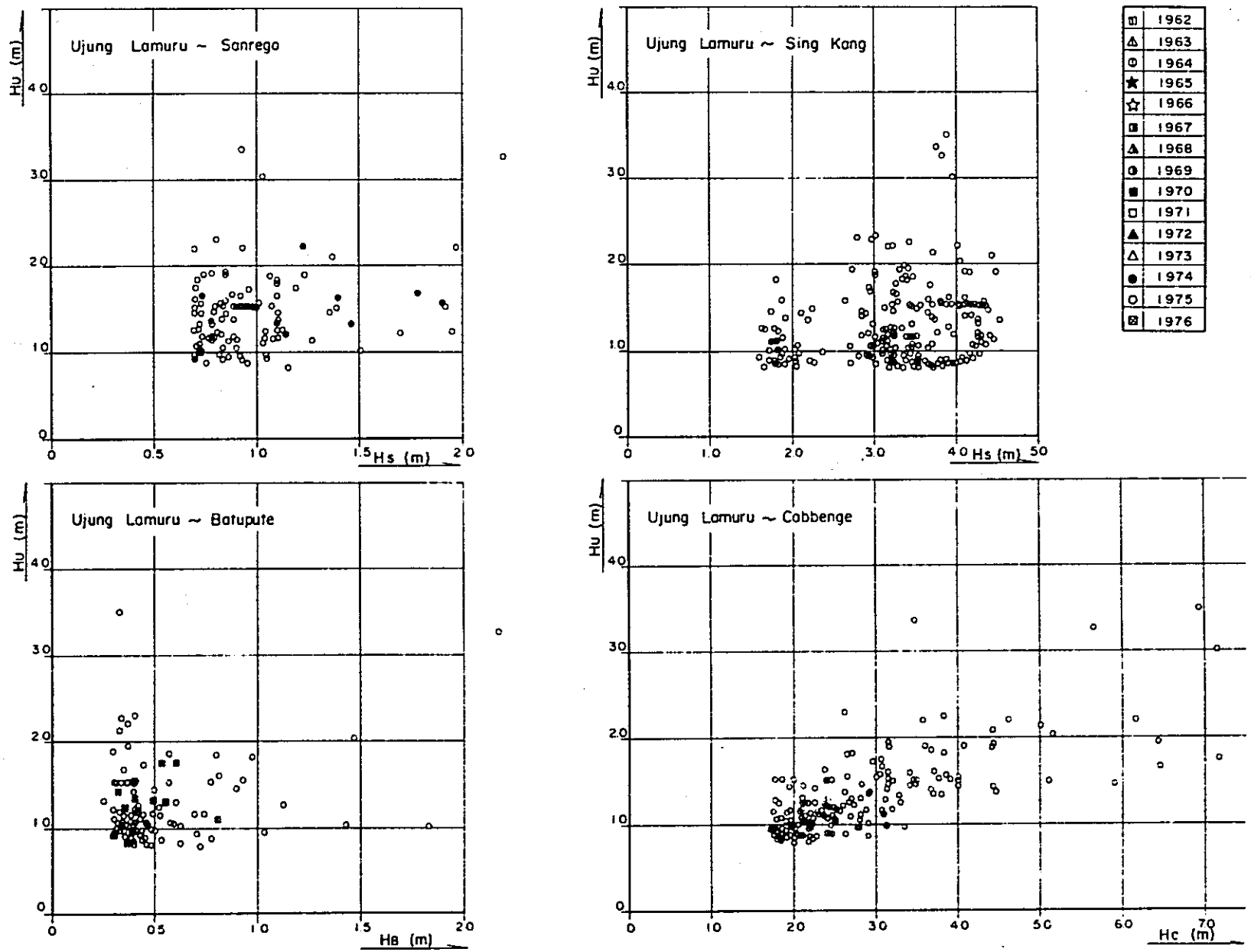


Fig. 12-5 DAILY WATER STAGE CORRELATION

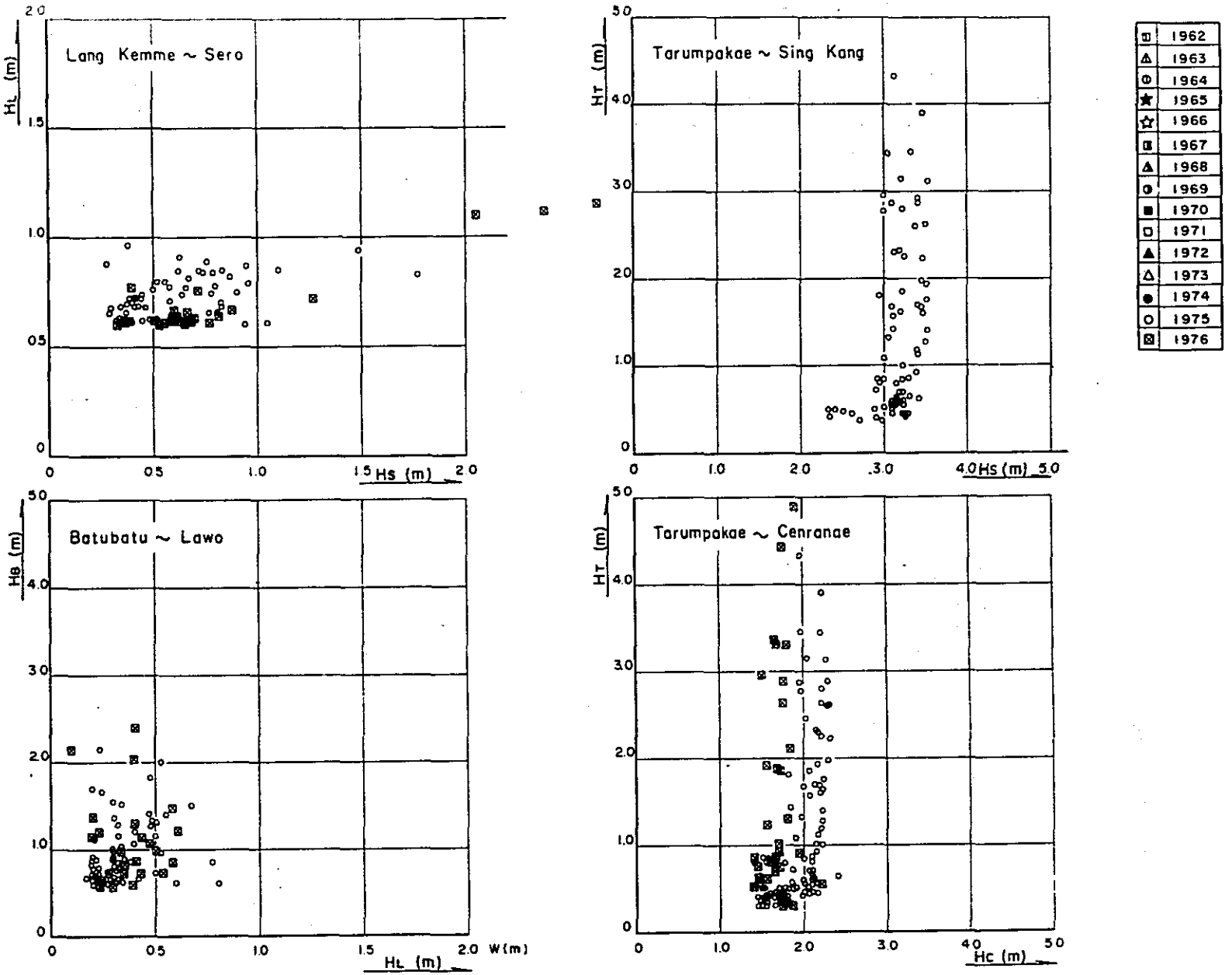


Fig. 12-6 • DAILY WATER STAGE CORRELATION

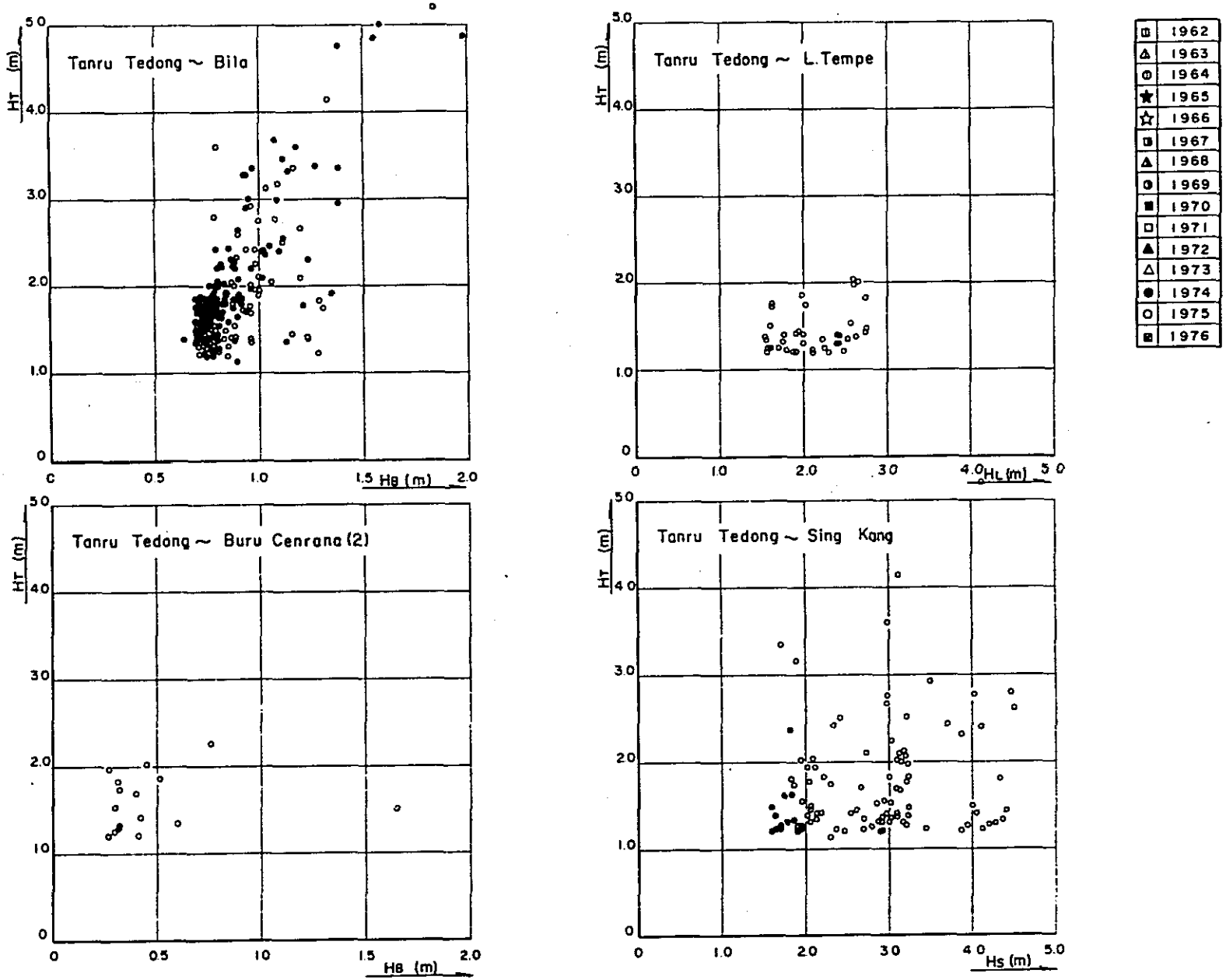
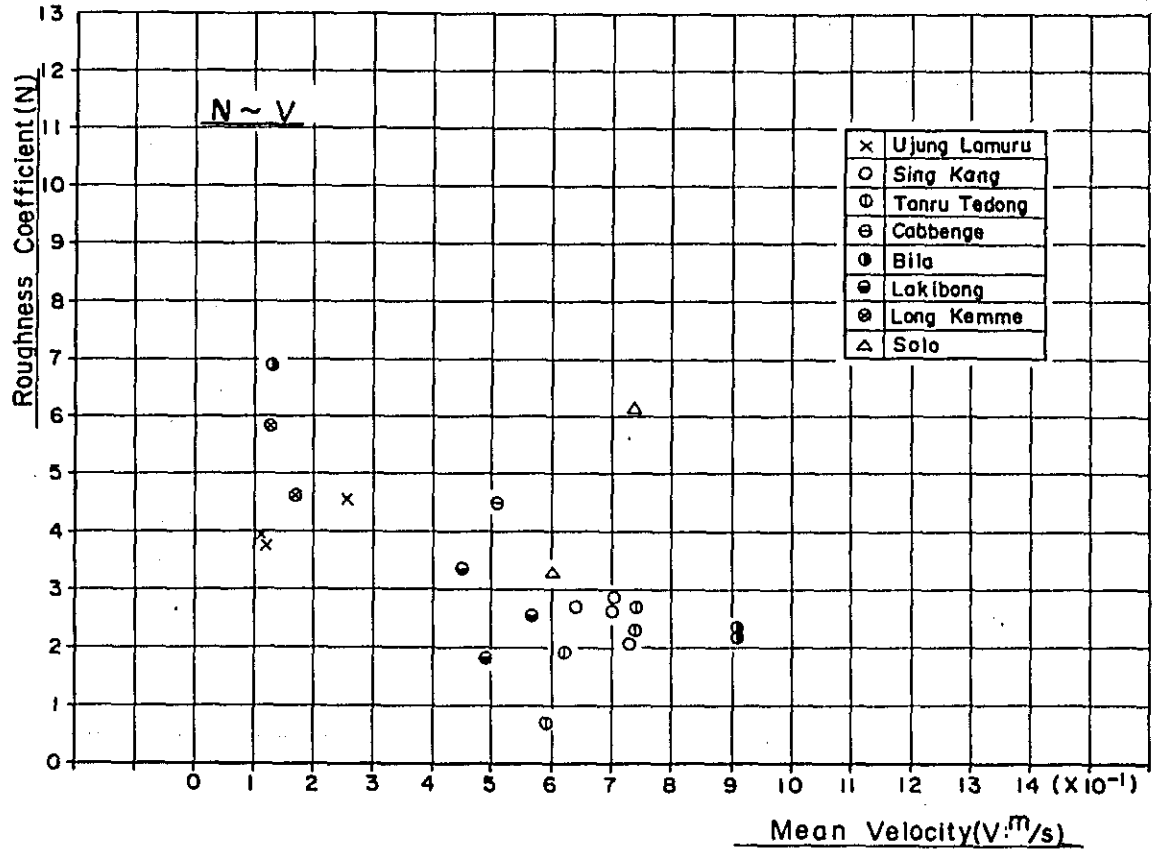


Fig. 13-1 MANNING ROUGHNESS COEFFICIENT



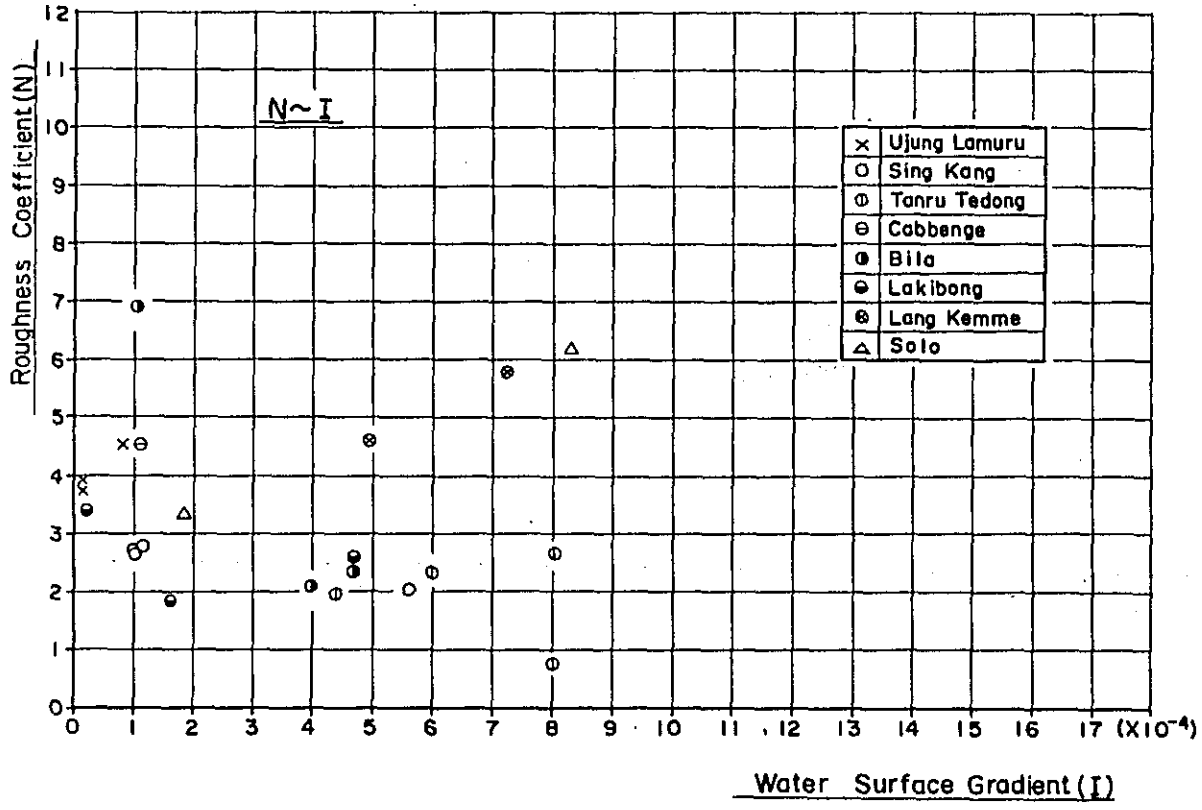
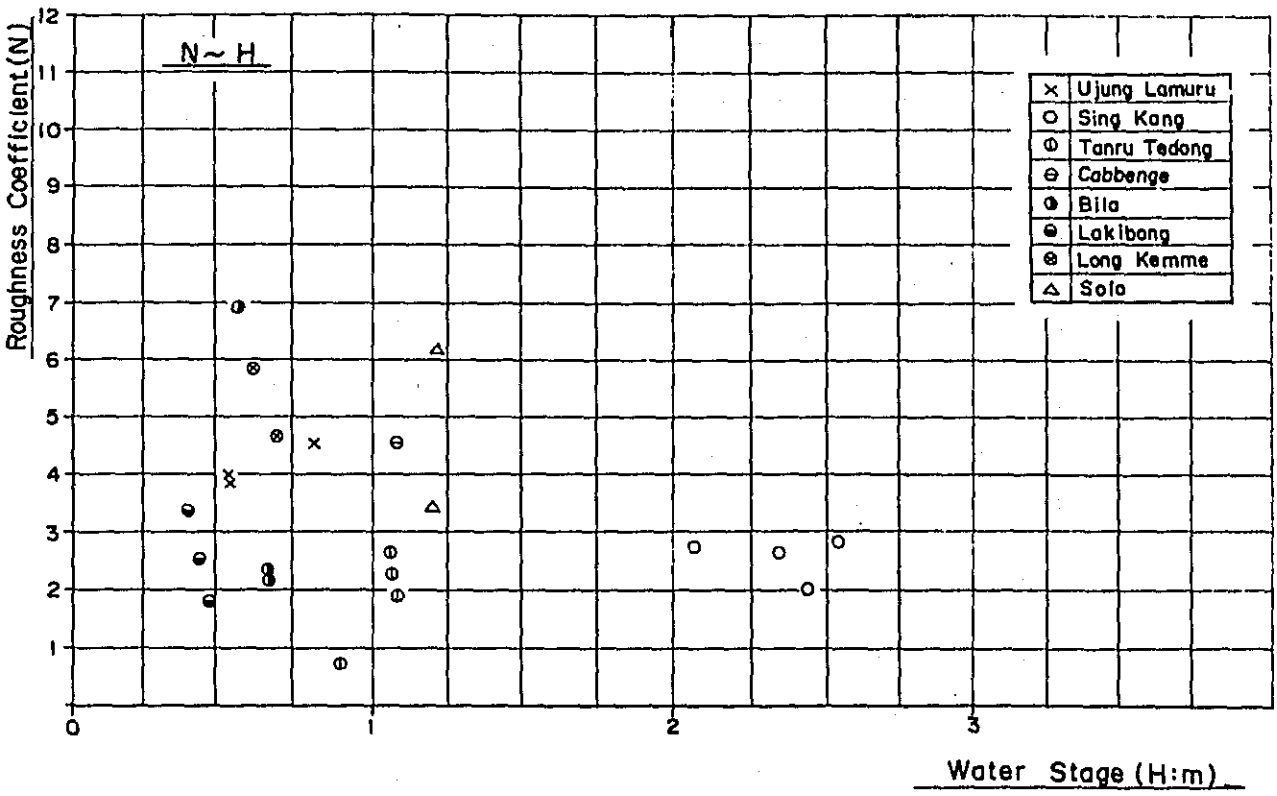


Fig. 13-2 MANNING ROUGHNESS COEFFICIENT



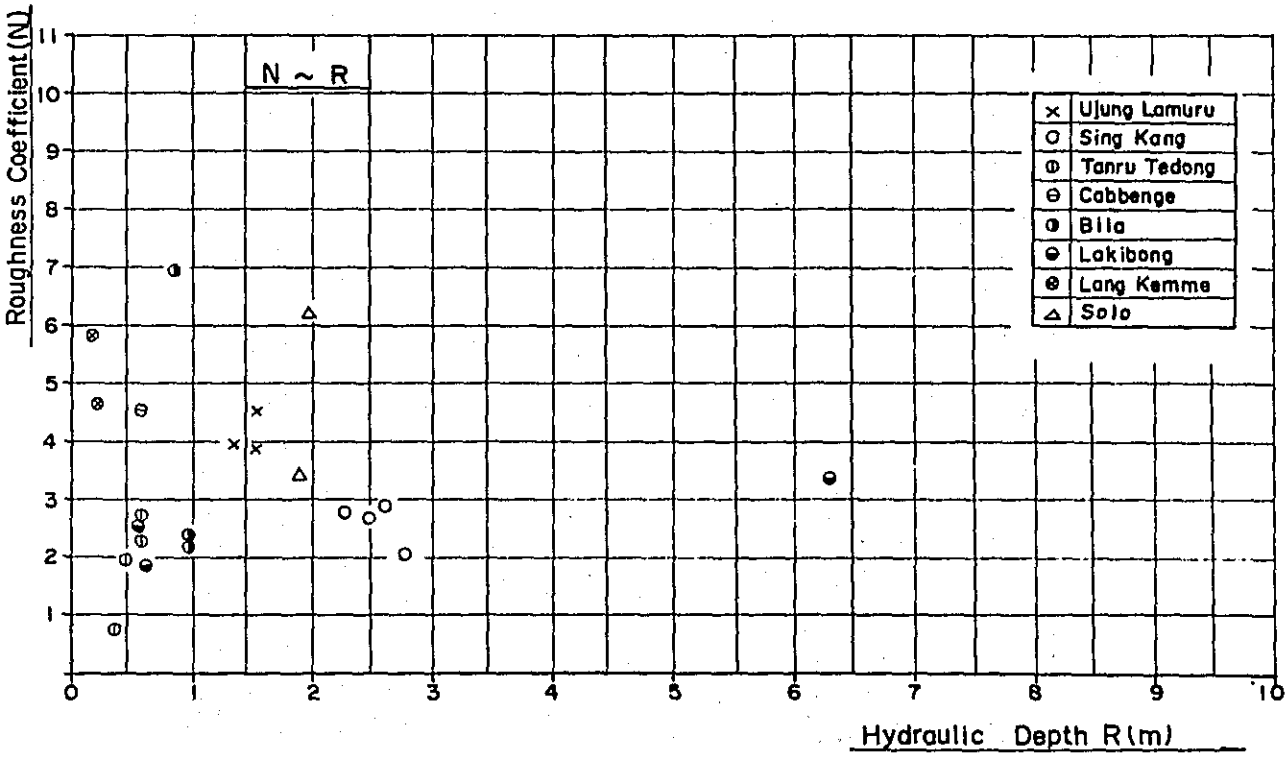


Table 13 "MANNING" ROUGHNESS COEFFICIENT FROM OBSERVATION DATA

Date	Place	Water Stage H (m)	Area $A(m^2)$	Mean Velocity $V(m^3/s)$	Hydraulic Depth	$R^{2/3}$	Measurement Result			Water Surface Gradient I	$I^{1/2}$	$I^{1/2} R^{2/3}$	$N=\frac{I^{1/2} \cdot R^{2/3}}{V}$
							H_1 (m)	H_2 (m)	Distance Δx (m)				
6/17	Ujung Lamuru	0.80	122.050	0.262	1.526	1.325	2.623	2.627	50.0	0.800×10^{-4}	0.894×10^{-2}	1.185×10^{-2}	4.523×10^{-2}
7/24	Tanru Tedong	1.06	40.875	0.739	0.584	0.699	1.452	1.492	50.0	8.000	2.828	1.977	2.675
7/24	Tanru Tedong	1.06	40.875	0.739	0.584	0.698	1.465	1.483	30.0	6.000	2.449	1.710	2.314
7/24	Sing Kang	2.55	273.020	0.702	2.600	1.891	3.410	3.430	176.5	1.133	1.064	2.012	2.866
7/24	Tanru Tedong	1.08	31.550	0.623	0.451	0.588	1.452	1.487	80.0	4.375	2.092	1.230	1 974
7/25	Bila	0.65	73.715	0.913	0.982	0.989	3.394	3.382	30.0	4.000	2.000	1.978	2.166
7/25	Bila	0.65	73.715	0.913	0.982	0.988	3.059	3.045	30.0	4.670	2.161	2.135	2.338
7/26	Lakibong	0.45	48.150	0.490	0.602	0.713	1.995	2.014	120.0	1.583	1.258	0.897	1.831
7/26	Buru Cenrana	0.04	9.030	0.626	0.181	0.319							
7/26	Lang Kemme	0.68	13.770	0.171	0.212	0.355	1.209	1.234	50.0	5.000	2.236	0.794	4.633
7/27	Sing Kang	2.35	259.975	0.698	2.476	1.830	3.400	3.410	96.5	1.030	1.015	1.856	2.659
7/27	Sing Kang	2.45	287 250	0.728	2.736	1.956	3.410	3.420	176.5	5.660	2.379	4.653	6.391
7/28	Ujung Lamuru	0.52	107.525	0.107	1.344	1.218	4.715	4.716	82.0	0.122	0.349	0.425	3.972
7/28	Lakibong	0.38	504.630	0.450	6.308	3.414	1.912	1.914	100.0	0.200	0.447	1.526	3.391
7/29	Solo	1.22	297.530	0.736	1.983	1.579	2.720	2.725	60.0	8.330	2.886	4.557	6.192
8/5	Solo	1.195	282.230	0.603	1.882	1.524	3.082	3.093	60.0	1.830	1.353	2.062	3.420
8/5	Sing Kang	2.07	238.400	0.642	2.270	1.727	2.140	2.150	96.5	1.036	1.018	1.758	2.738
8/6	Bila	0.55	66.875	0.128	0.836	0.887	3.470	3.475	50.0	1.000	1.000	0.887	6.930
8/6	Tanru Tedong	0.89	24.420	0.589	0.349	0.496	1.425	1.419	50.0	8.000	2.828	1.403	2.382
8/6	Cabbenge	1.08	52.400	0.506	0.582	0.697	1.378	1.4325	50.0	1.090	1.044	0.728	1.439
8/7	Lakibong	0.42	43.400	0.568	0.543	0.666	1.978	2.025	100.0	4.700	2.168	1.444	2.542
8/7	Lang Kemme	0.60	9.775	0.129	0.150	0.282	1.338	1.374	50.0	7.200	2.683	0.757	5.868
8/7	Ujung Lamuru	0.52	121.410	0.119	1.518	1.321	4.585	4.586	82.0	0.122	0.349	0.461	3.874

4. New Observation Station

4.1 Proposal for Installation Points

The condition to install new observation station have already been proposed in the Interim Report - May 1976 - according to the current hydrological observation network.

They are:

i) Master Plan making of this project is to start a few years later.

ii) The current observation is to be continuously carried on and data arrangement is to be successfully back followed.

iii) Plan making is to be based on the observation result at new observation stations which will be installed.

Taking rainfall characteristics of the area, such as rainfall duration period and rainfall influence sphere, into account, it is necessary to install not only more rainfall observation stations but also more water stage observation stations. So we selected the following three points for rainfall observation and four points for water-stage observation for the time being as follows:

Automatic rain-gauge stations:

i) Bance: Walanae River Basin (Upstream)

ii) Saleko: Cenranae River Basin

iii) Bila: Bila River Basin

Automatic water-stage gauge station:

i) Burucenrana: Boya River

ii) Tempe: Lake Tempe

iii) Pallette: Watan Pone

iv) Kalempang: Mario River

Fig. 14 is a location map of those proposed points.

In order to insure the best observation results, it is needless to say that the number of observation stations should be increased. In addition to the above list, the following places are, therefore, recommended as desirable installation points.

Rain Gauge Station:

i) Boya River (Baraka)
ii) Upstream of Boya River (Upstream of Baraka)
iii) Around Lake Tempe (Batu Batu)
iv) Mario River (Bottsirih)
v) Gilirang River

Water Gauge Station:

i) Walanae River (Lakibong, Mong Dam Site)
ii) Minraleng River (Lemo)
iii) Gilirang River

4.2 Surveying and Approximate Design

Two time reconnaissance surveys were conducted to select the installation points for three automatic rain-gauge stations and four automatic water-gauge stations. No special difficulties are anticipated in the installation of rain-gauge stations, however, the installation of water-gauge stations, such further investigations of geology and bearing power of the foundation of site of stations, fluctuation of water-stage, and maintenance and administration procedures of the proposed stations after completion are required.

A design of water-gauge stations is shown in Fig.15. Findings of reconnaissance survey at Pallette, Boya River and Mario River are shown in Fig.16 and Fig.17. Preliminary design of water-stage observation stations based on the above-mentioned reconnaissance survey is shown in Fig.18. In regard to Tempe station, above all others, a further survey is strongly recommended as to bearing power of foundation which is consisting of silty fine sand, although the superstructure is located 7 meters above the lake bed level and is considered well protected, taking actual water-stage fluctuation records in the past into consideration. Also, a further re-survey before commencement of the construction work of the Pallette automatic tide-gauge station is recommended for fear of a local scour of foundation of the station due to drift sand and tidal current as it is located at the tip of the peninsula but for the superstructure of the station, on the contrary, nothing may have to be worried about as it is

designed about five meters high from the bottom and this view is supported by the findings of our recent survey and the tidal records at Bajoe. Since there is a greater difference in water depth of the Boya and Mario Rivers between wet and dry seasons, difficulties were experienced in selecting site location of the proposed observation stations. The new station site in the Boya River is located at the outside and downstream side of the meandering bend where impact of the flow is greater, therefore, before construction of the station, a precautionary considerations in slope protection of the outer bank of the bend in the neighbourhood area of the station is recommended. The proposed construction site of the observation station is located along the Mario River where the river depth is shallow and the cross section is flat and simple. Therefore, it is feared that the intake will be buried under sediment load at the time of floods. Though the intake was designed taking an easier flushing of silt into consideration, a further consideration will be given to maintenance of the apparatus to avoid observation interruptions due to quite possible silt deposit.

Fig. 14 PROPOSAL LOCATION OF NEW OBSERVATION STATIONS

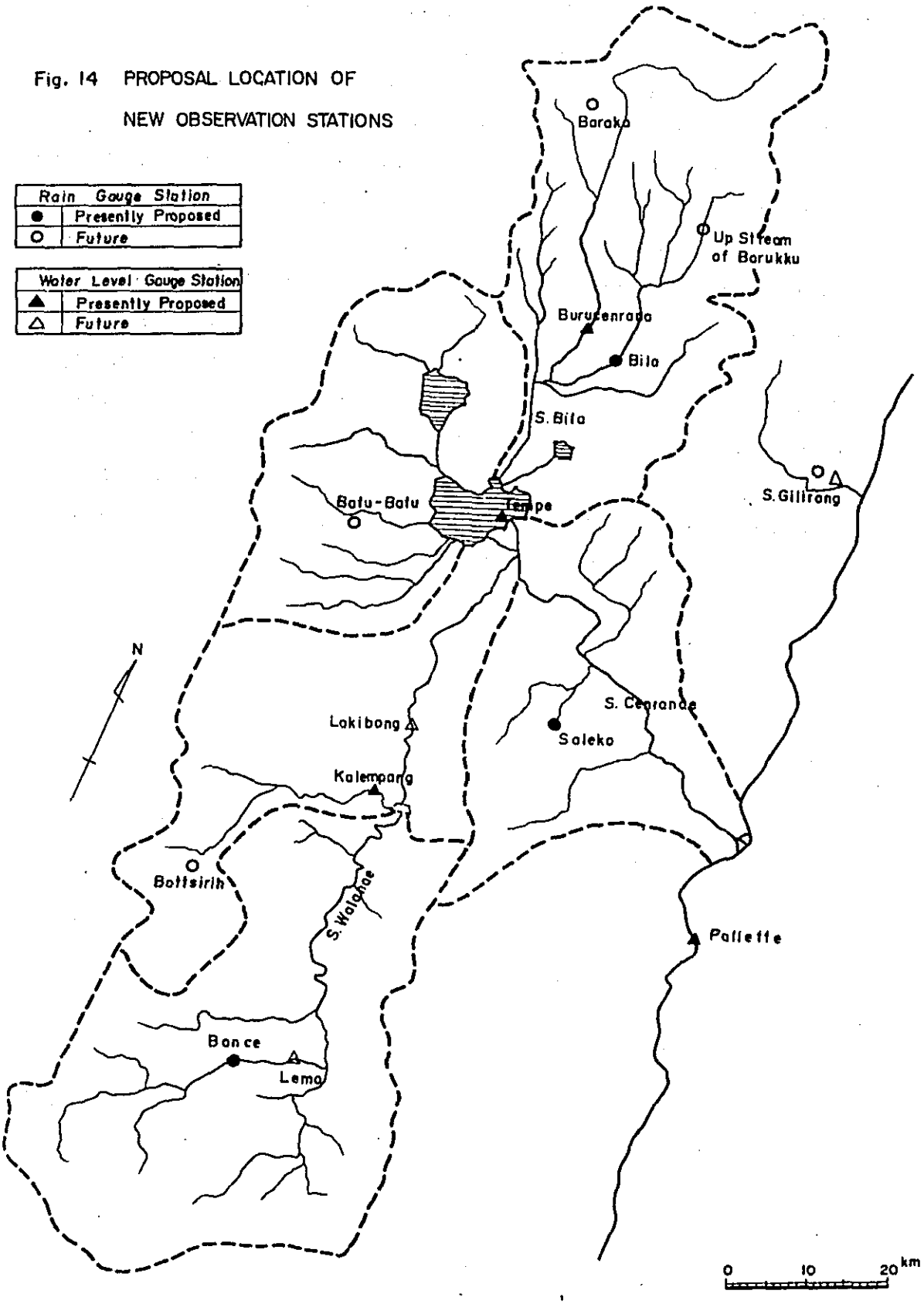


Fig. 15 APPROXIMATE DESIGN OF STANDARD RAINGAUGE STATION

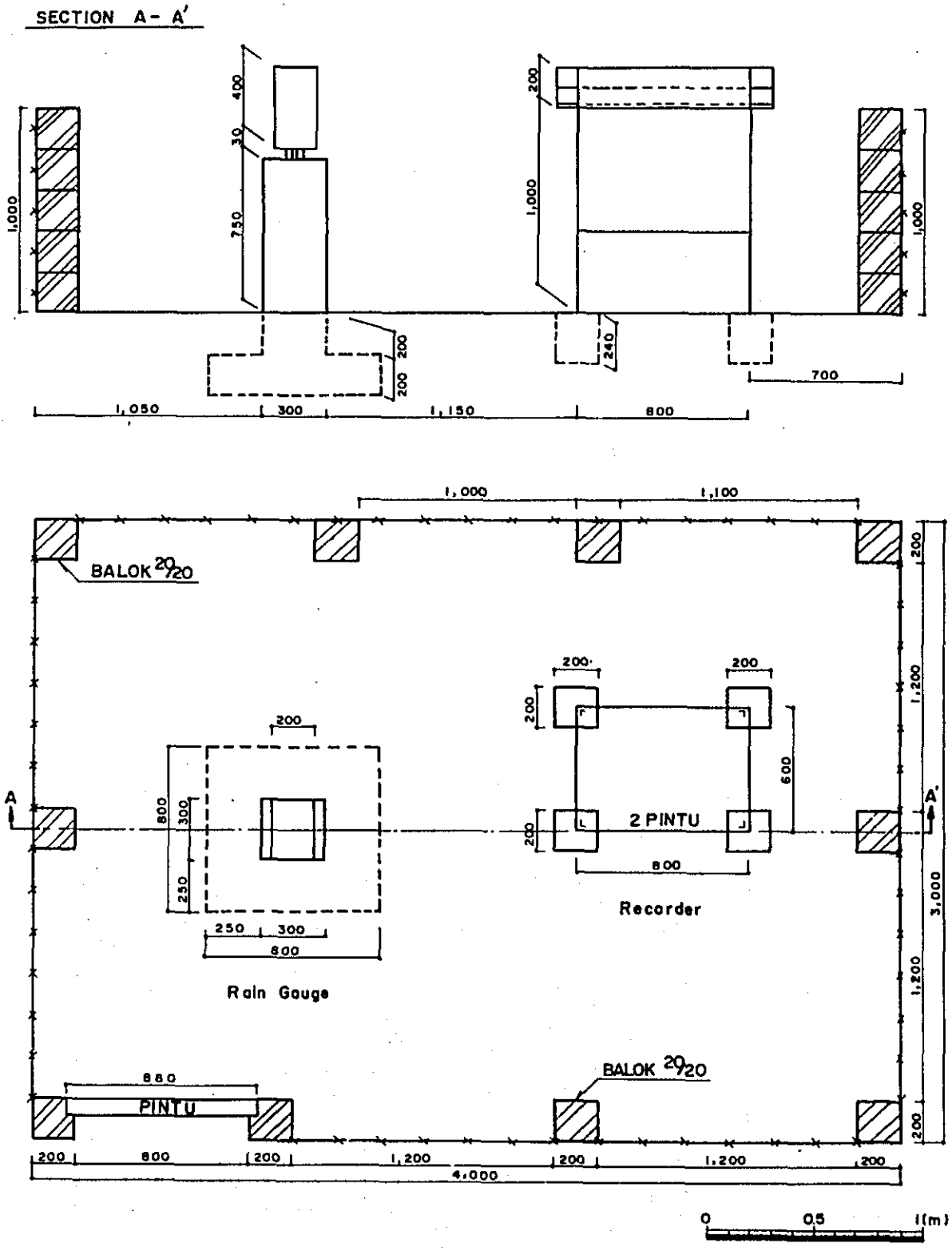
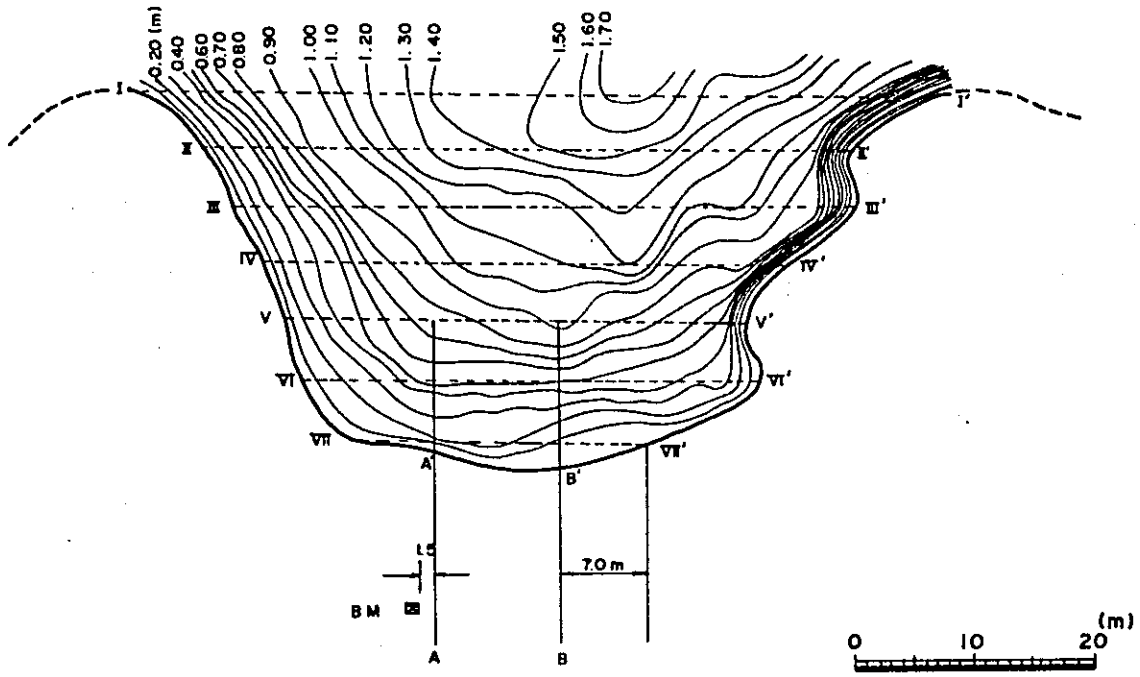


Fig. 16 ISOBATHC LINE AT PALLETTE

LOCATION Pallette



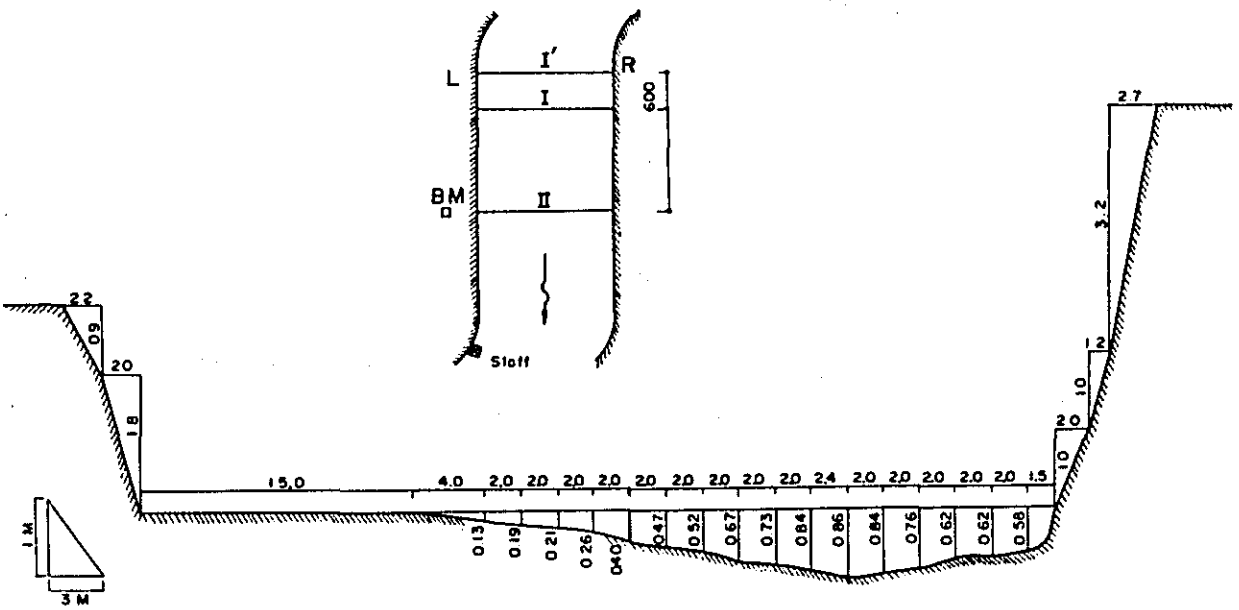
	I - I'		II - II'		III - III'		IV - IV'		V - V'		VI - VI'		VII - VII'	
	ΔX	h	ΔX	h	ΔX	h	ΔX	h	ΔX	h	ΔX	h	ΔX	h
NO. 1 (L)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	0.80	10	0.40	5	0.65	2	0.86	6.5	0.65	4	0.35	5	0.27
3	5	0.95	5	0.93	5	1.26	5	0.89	5	0.78	5	0.46	5	0.25
4	5	1.19	5	1.14	5	1.18	5	1.23	5	0.94	5	0.46	5	0.18
5	5	1.40	5	1.37	5	1.36	5	1.10	5	0.87	5	0.56	5	0.07
6	5	1.40	5	1.46	5	1.18	5	1.14	5	0.74	5	0.52	4	0.07
7	5	1.48	5	1.55	5	1.14	5	1.02	5	0.64	5	0.58	1	0
8	5	1.70	5	1.55	5	1.09	5	0.82	5	0.45	5	0.35		
9	5	1.70	5	1.51	5	0.94	5	0.48	3	0	4	0		
10	5	1.40	5	1.18	5	0.62	8	0						
11	5	1.37	5	1.00	7	0								
12	5	1.20	5	0										
13	5	1.00												
14 (R)	2	0												

ΔX : Distance (m)
h : Depth (m)

Fig. 17-1 CROSS SECTION FIGURES

25. July 1976

BOYA RIVER CROSS SECTION I'



25. July 1976

BOYA RIVER CROSS SECTION I

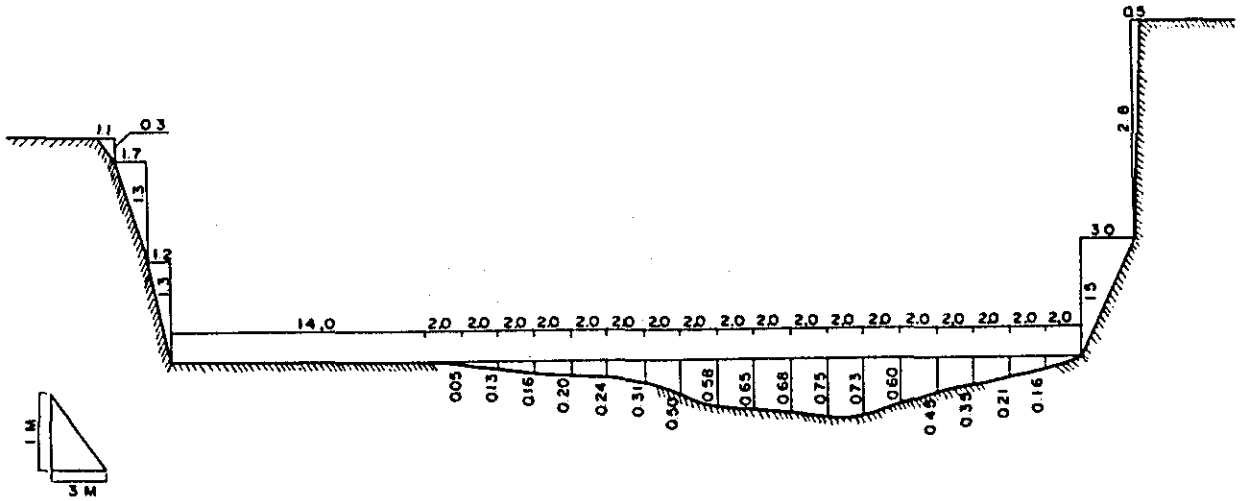
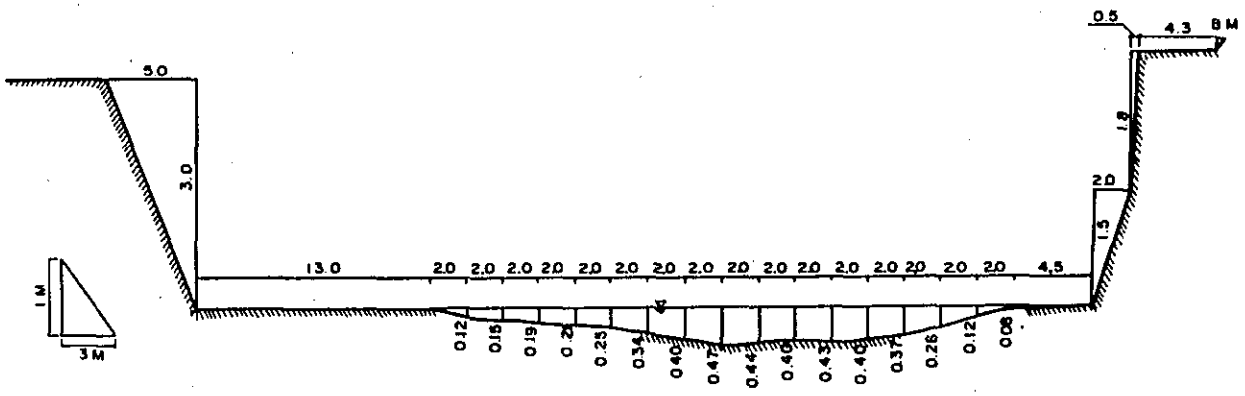


Fig. 17-2 CROSS SECTION FIGURES

25. July 1976

BOYA RIVER CROSS SECTION II



MARIO RIVER

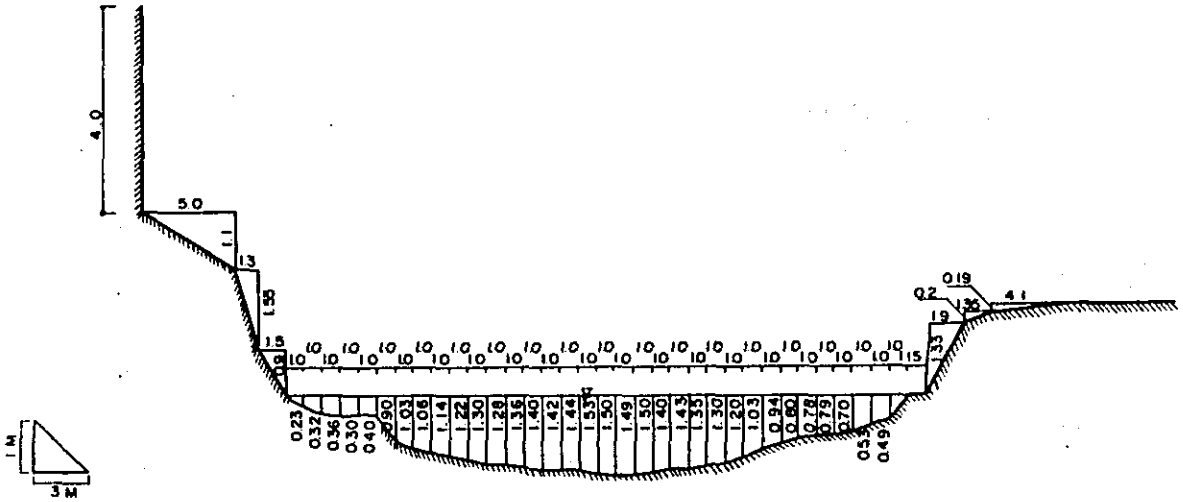
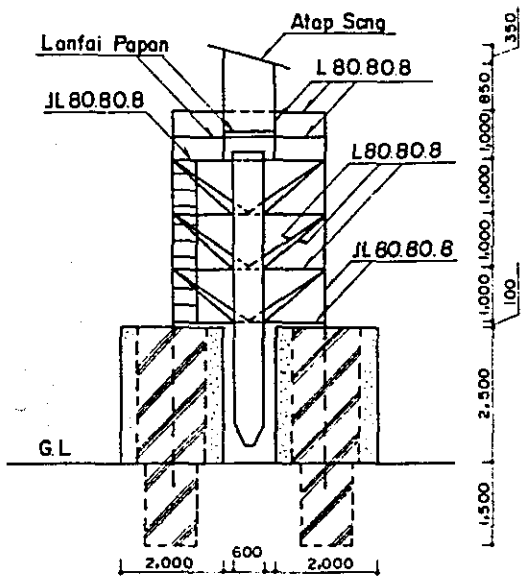


Fig. 18-1 APPROXIMATE DESIGN OF NEW WATER STAGE OBSERVATION STATION -Pallette-



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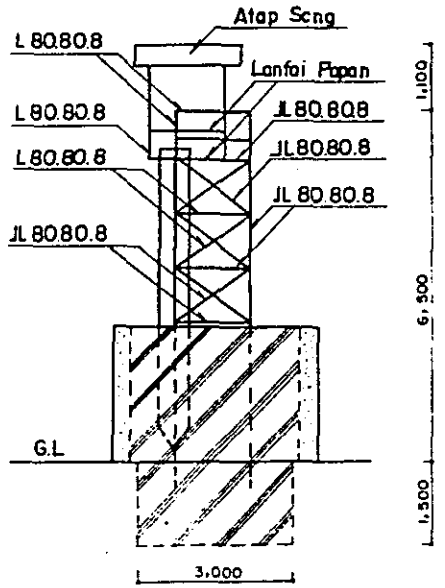
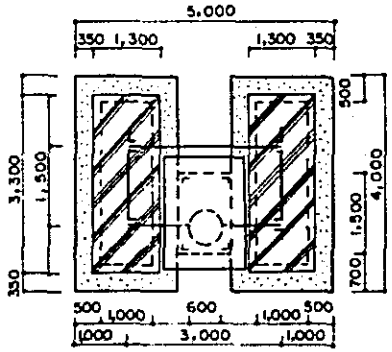


PANDANGAN SAMPING KANAN

DENAH



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KETERANGAN

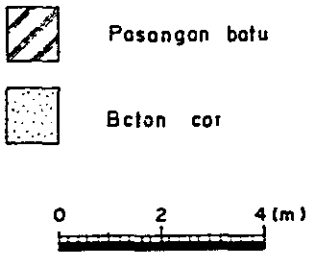


Fig. 18-2 APPOXIMATE DESIGN OF NEW WATER STAGE OBSERVATION STATION – Tempe –

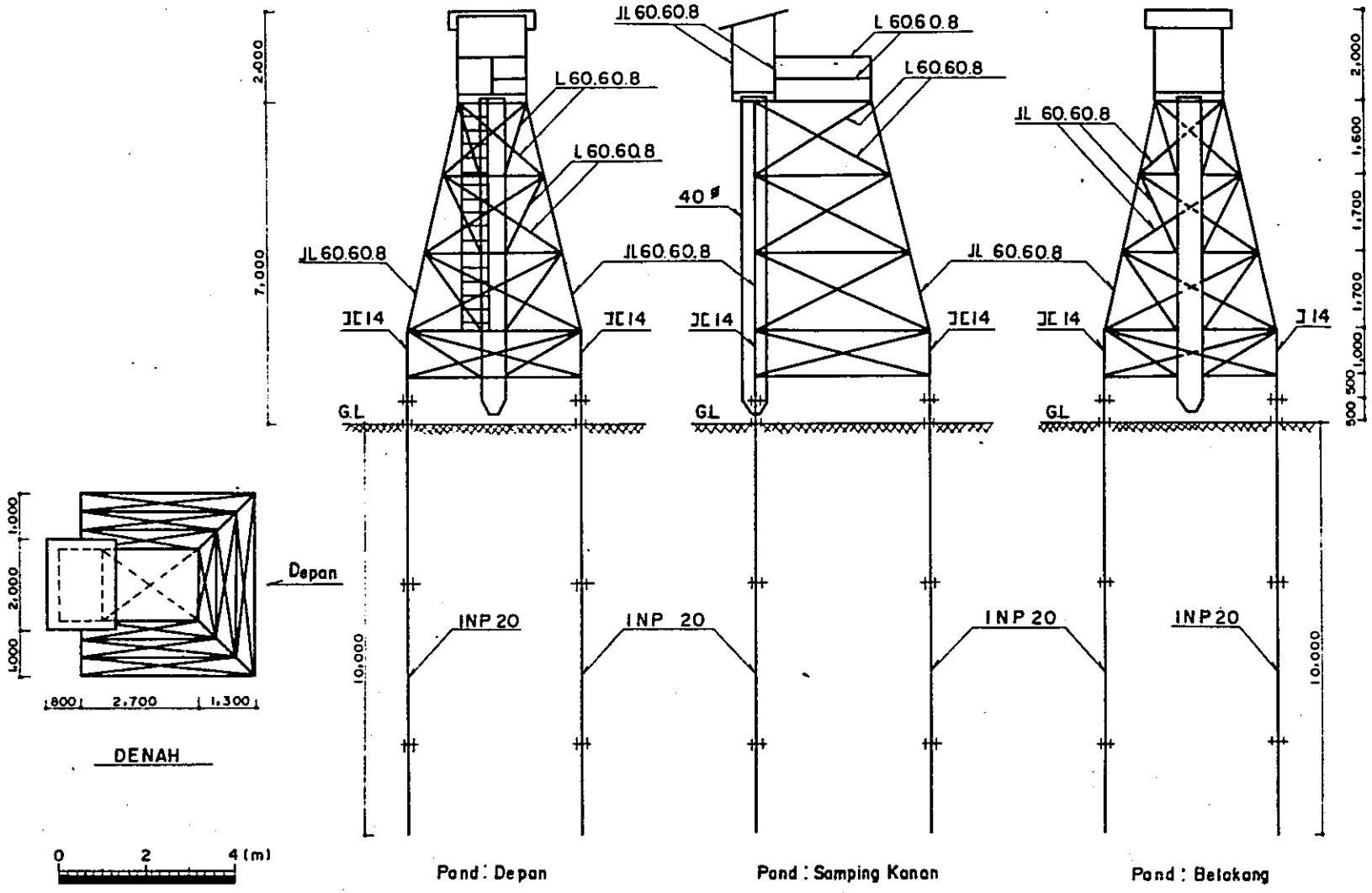


Fig. 18-3 APPROXIMATE DESIGN OF NEW WATER STAGE OBSERVATION STATION – Kalempang–

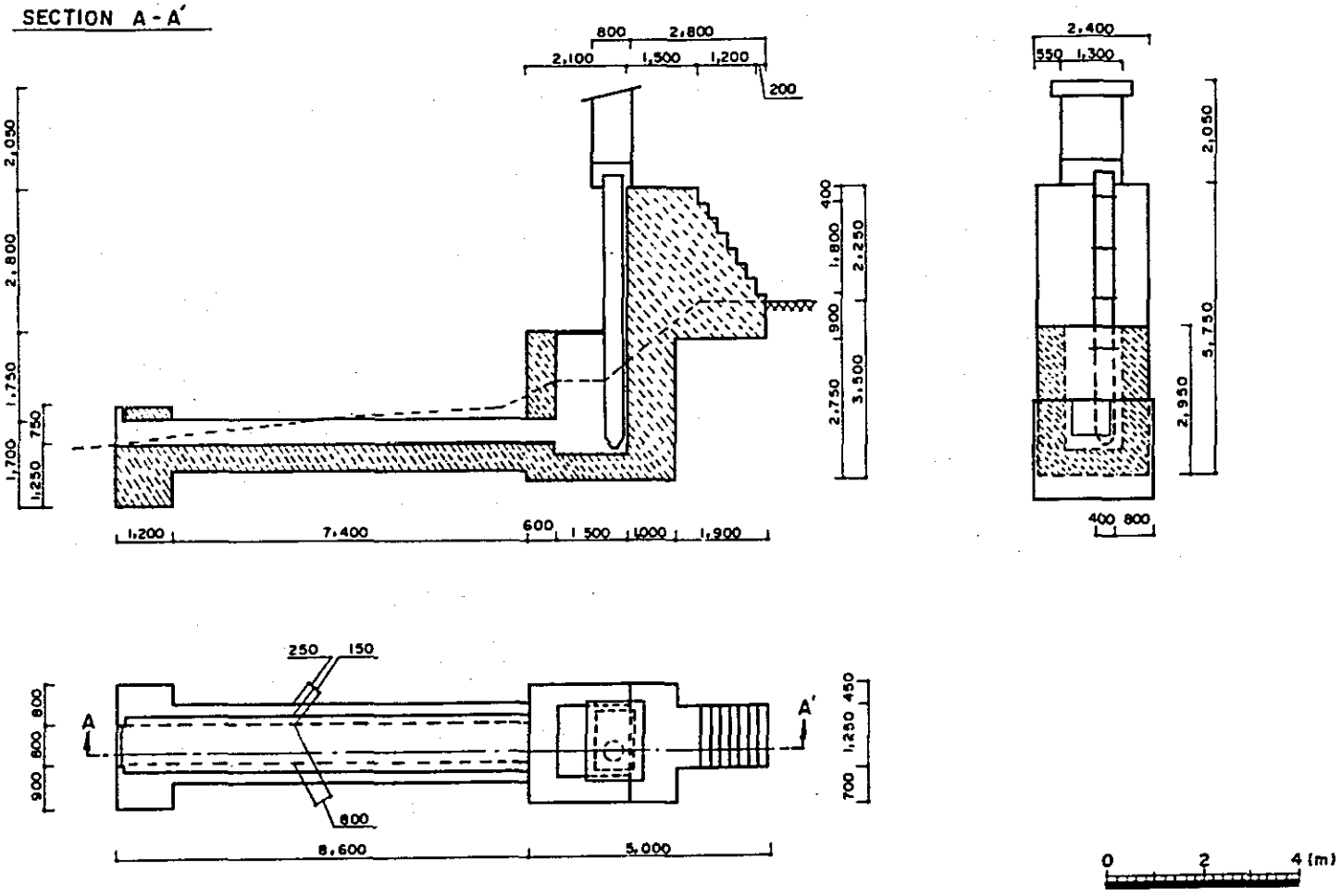
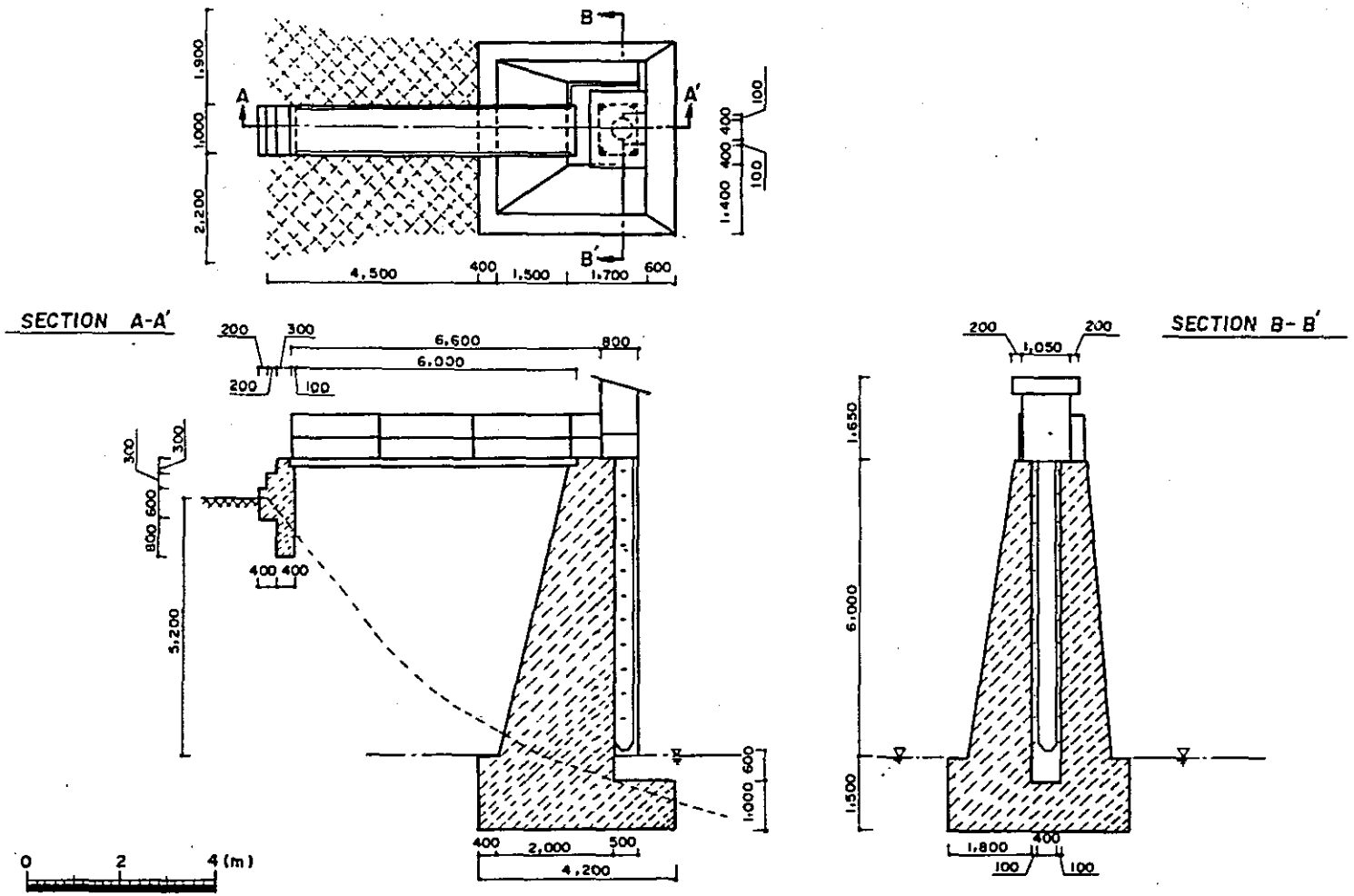


Fig. 18-4 APPROXIMATE DESIGN OF NEW WATER STAGE OBSERVATION STATION – Burucenrona–

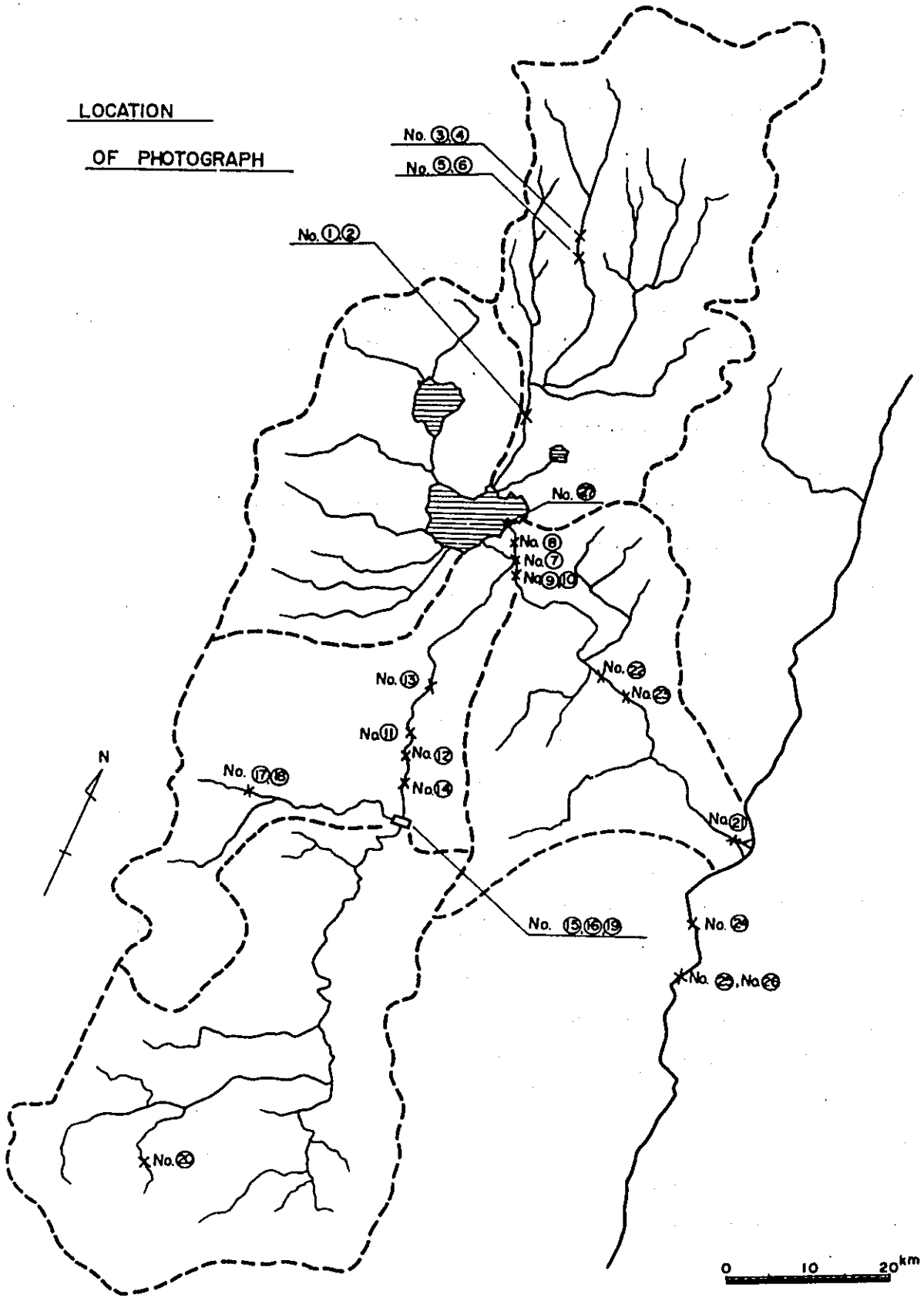


REFERENCE MATERIALS

Photographs.

Monthly Mean Rainfall.

LIST OF PHOTOGRAPHS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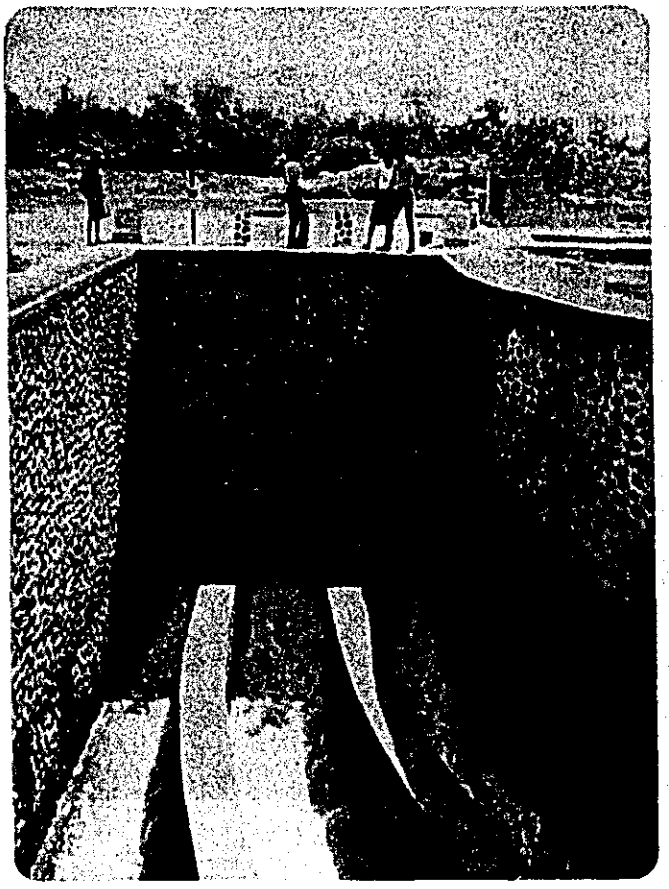

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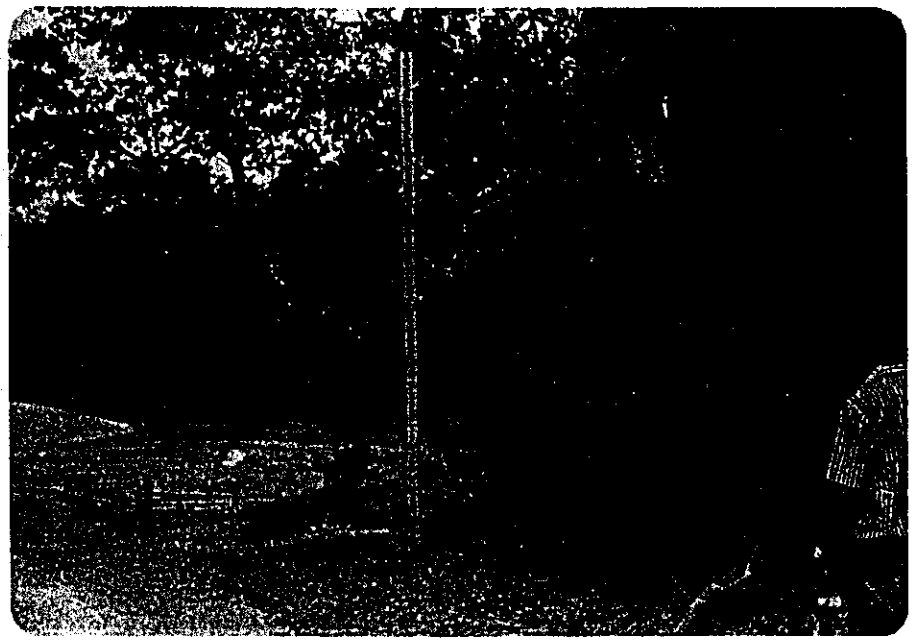

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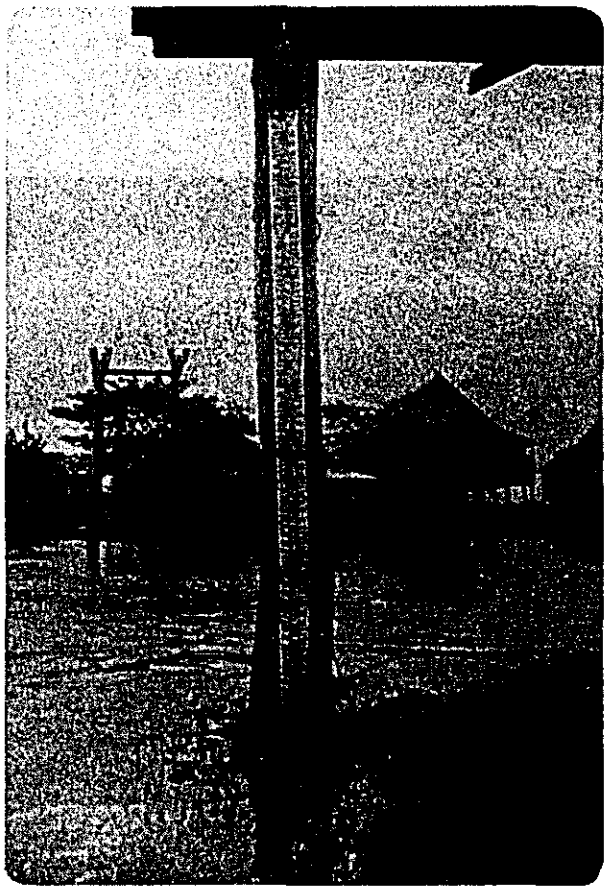

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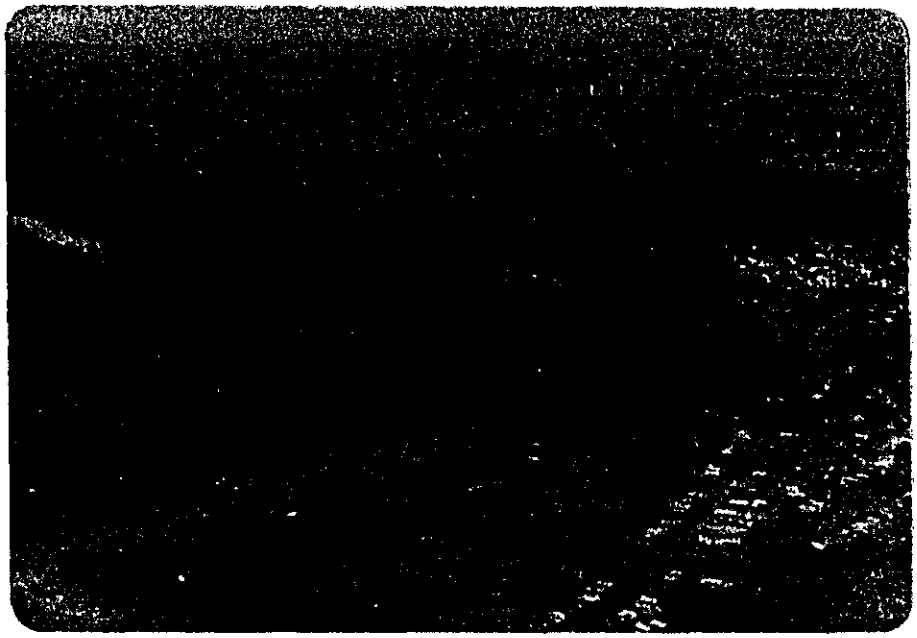

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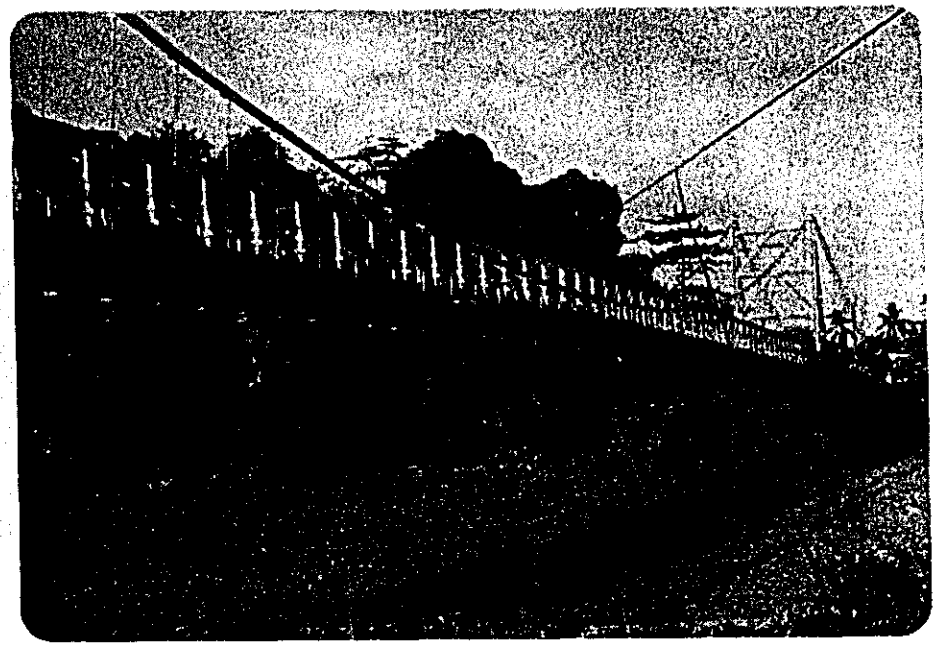

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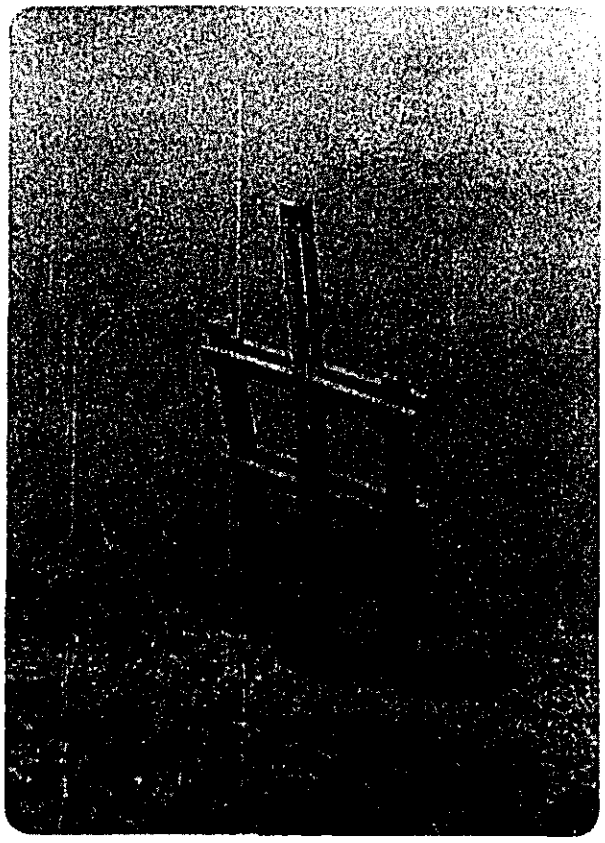

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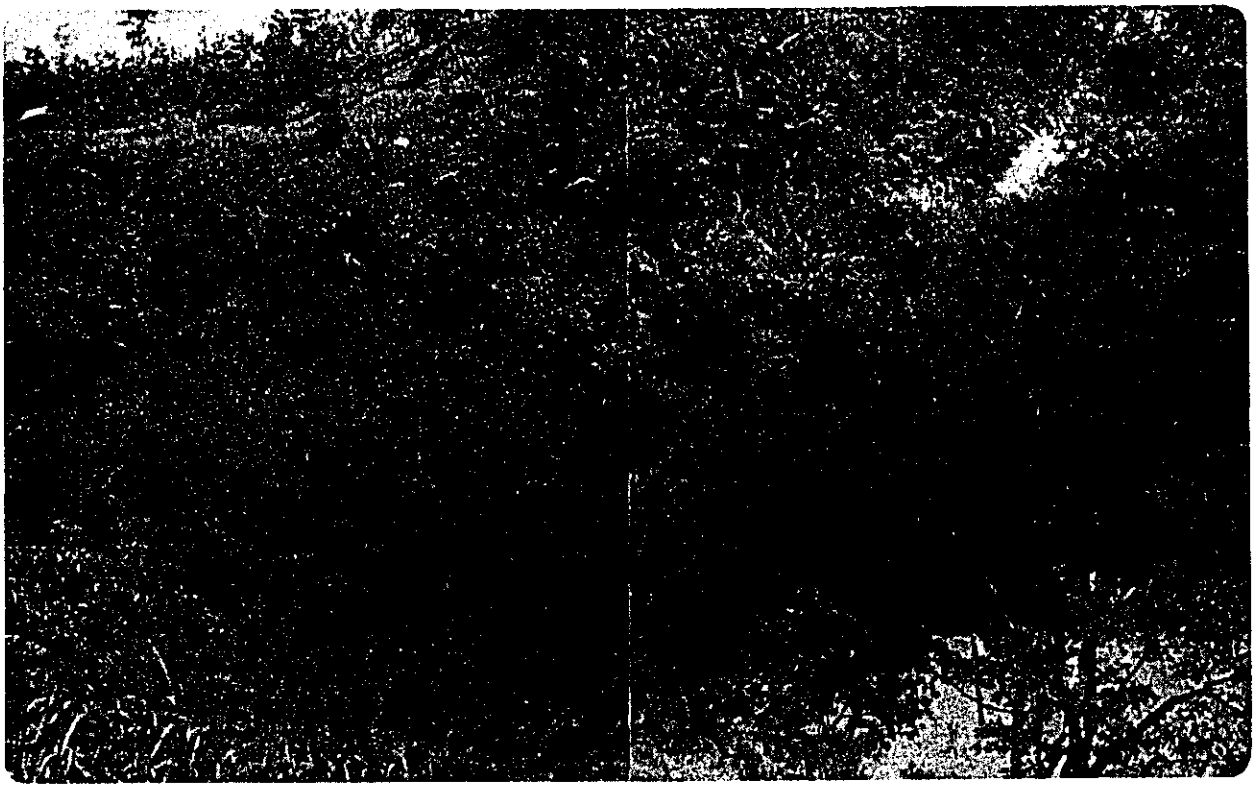

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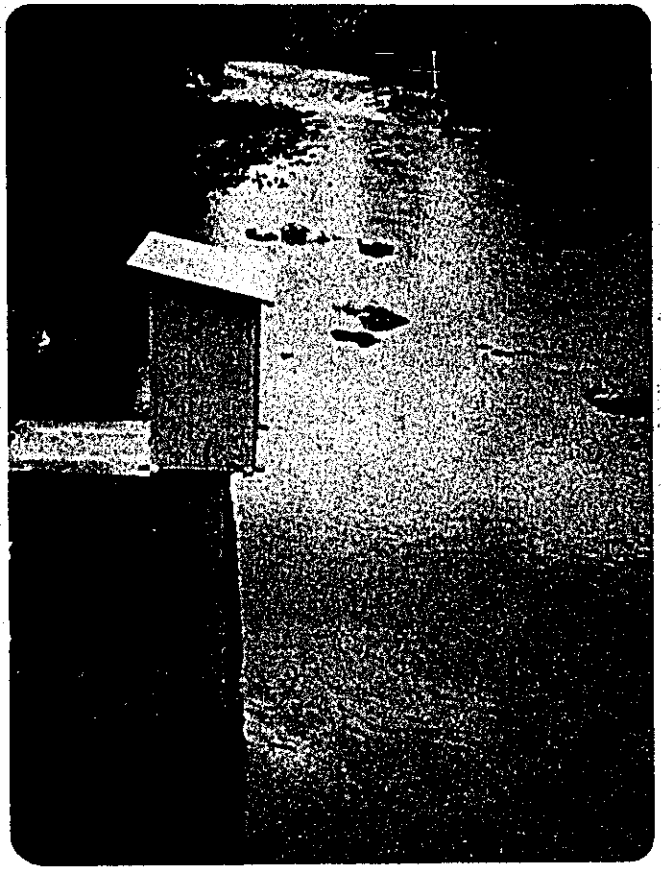

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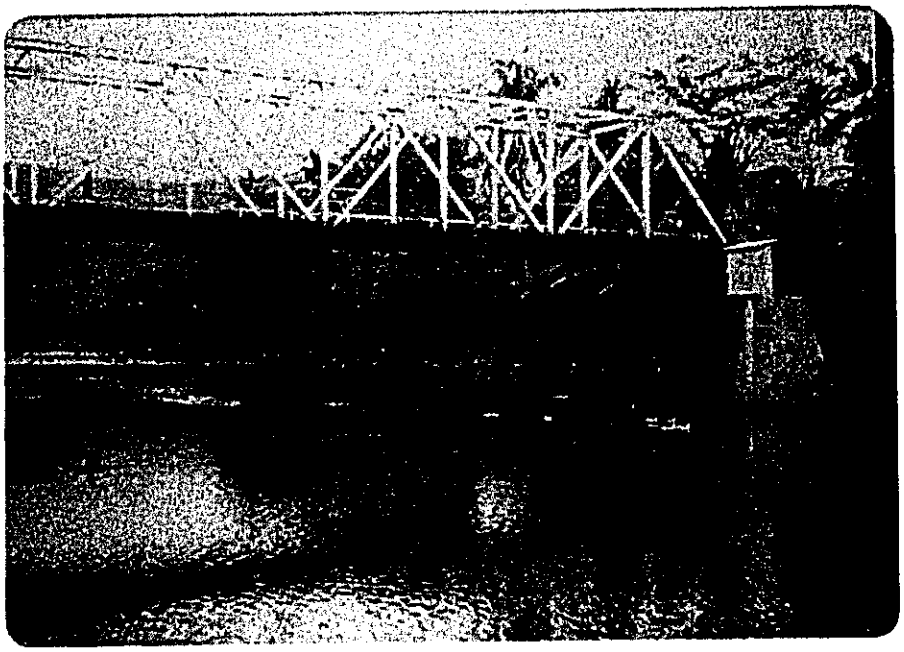

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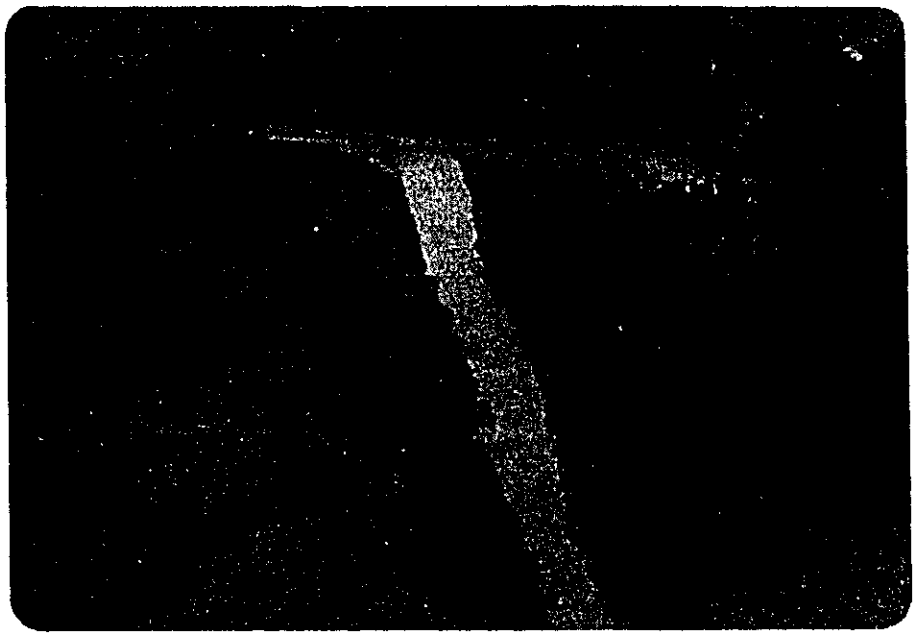

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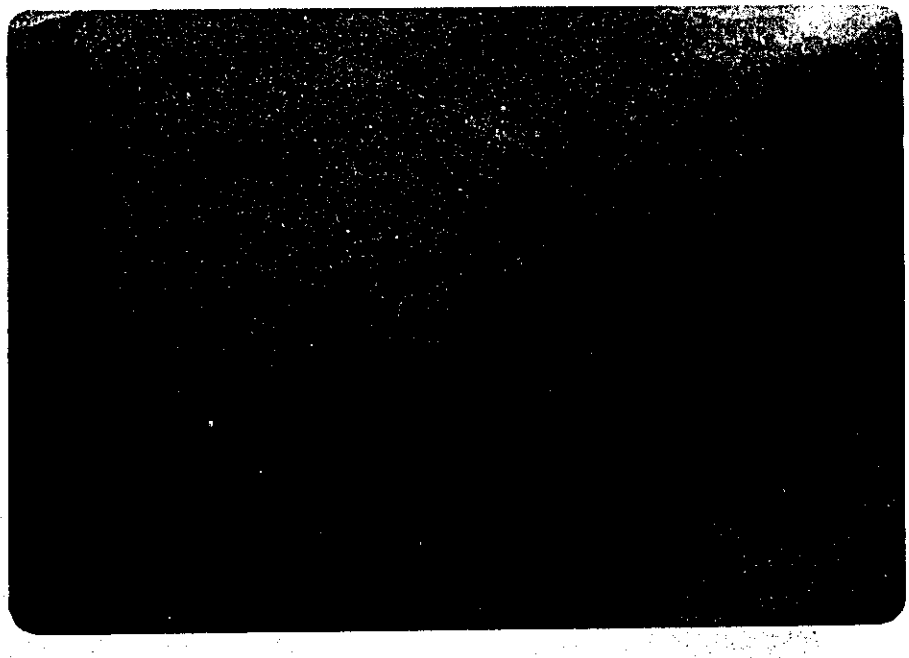

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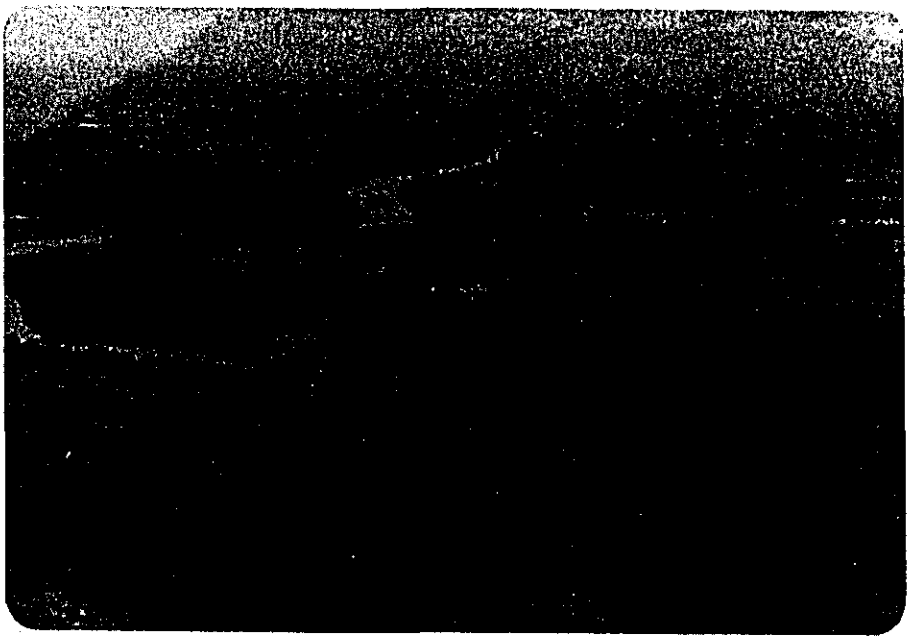

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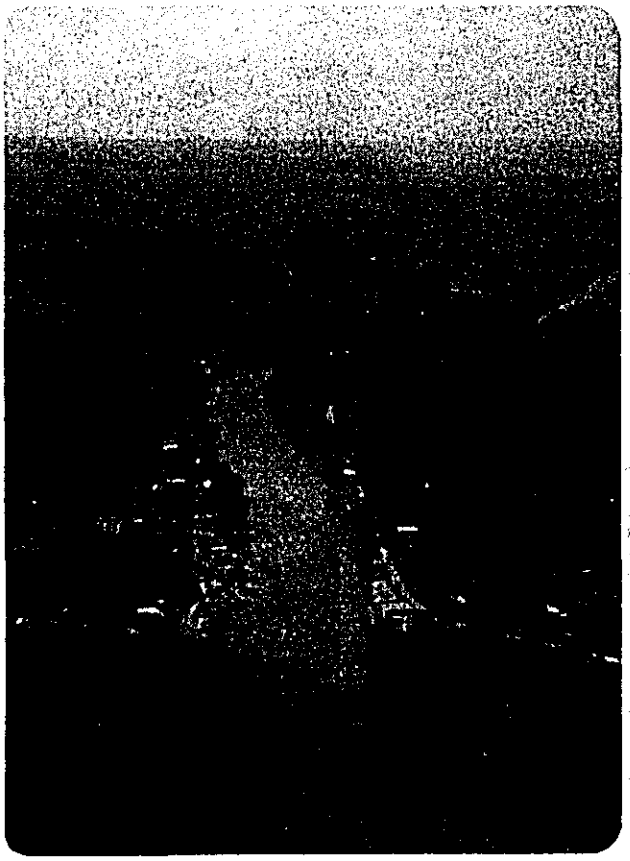

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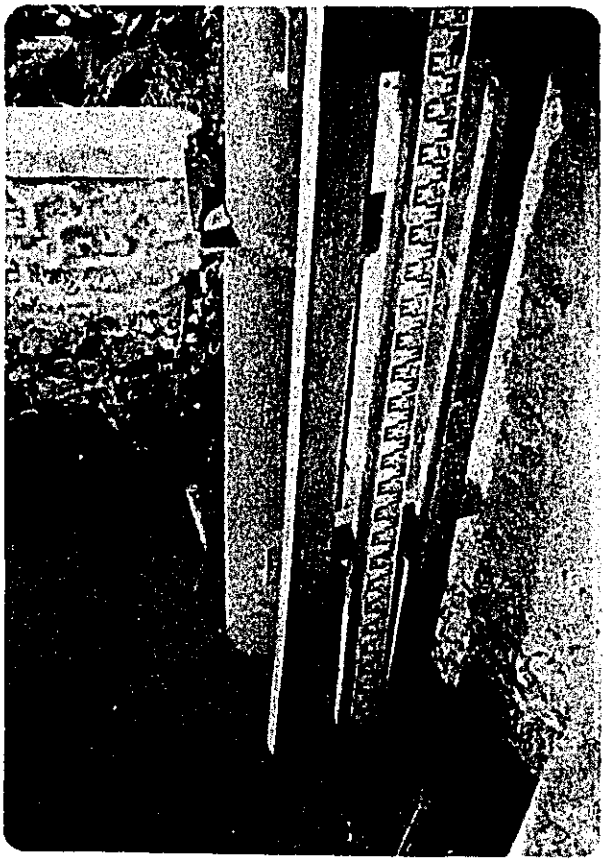

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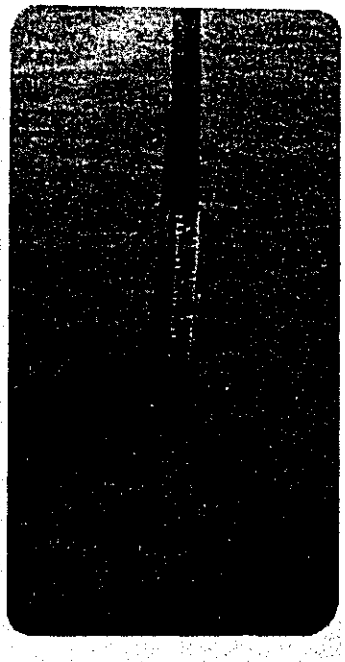

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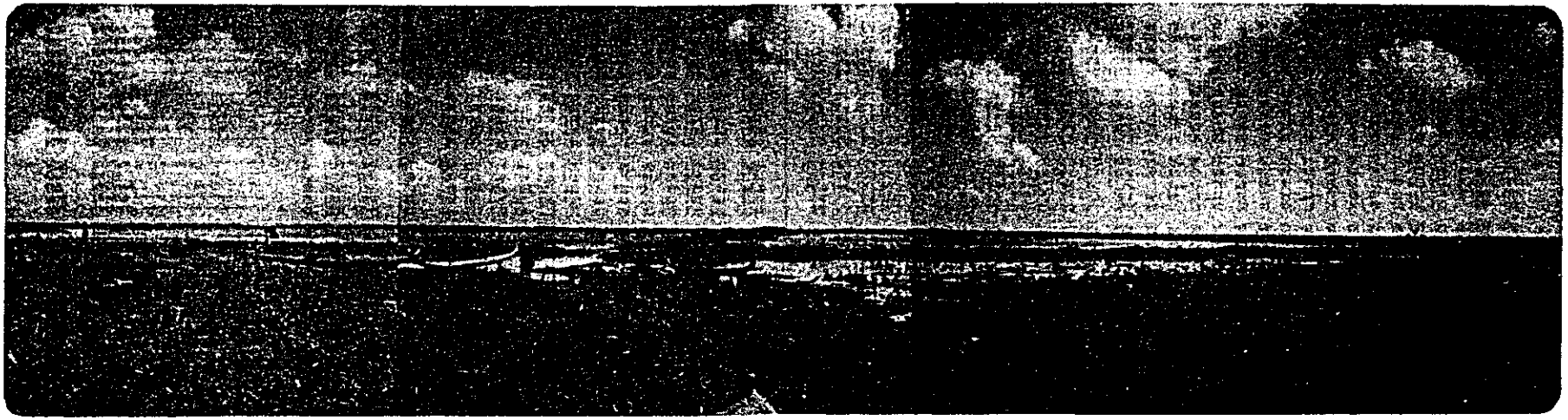
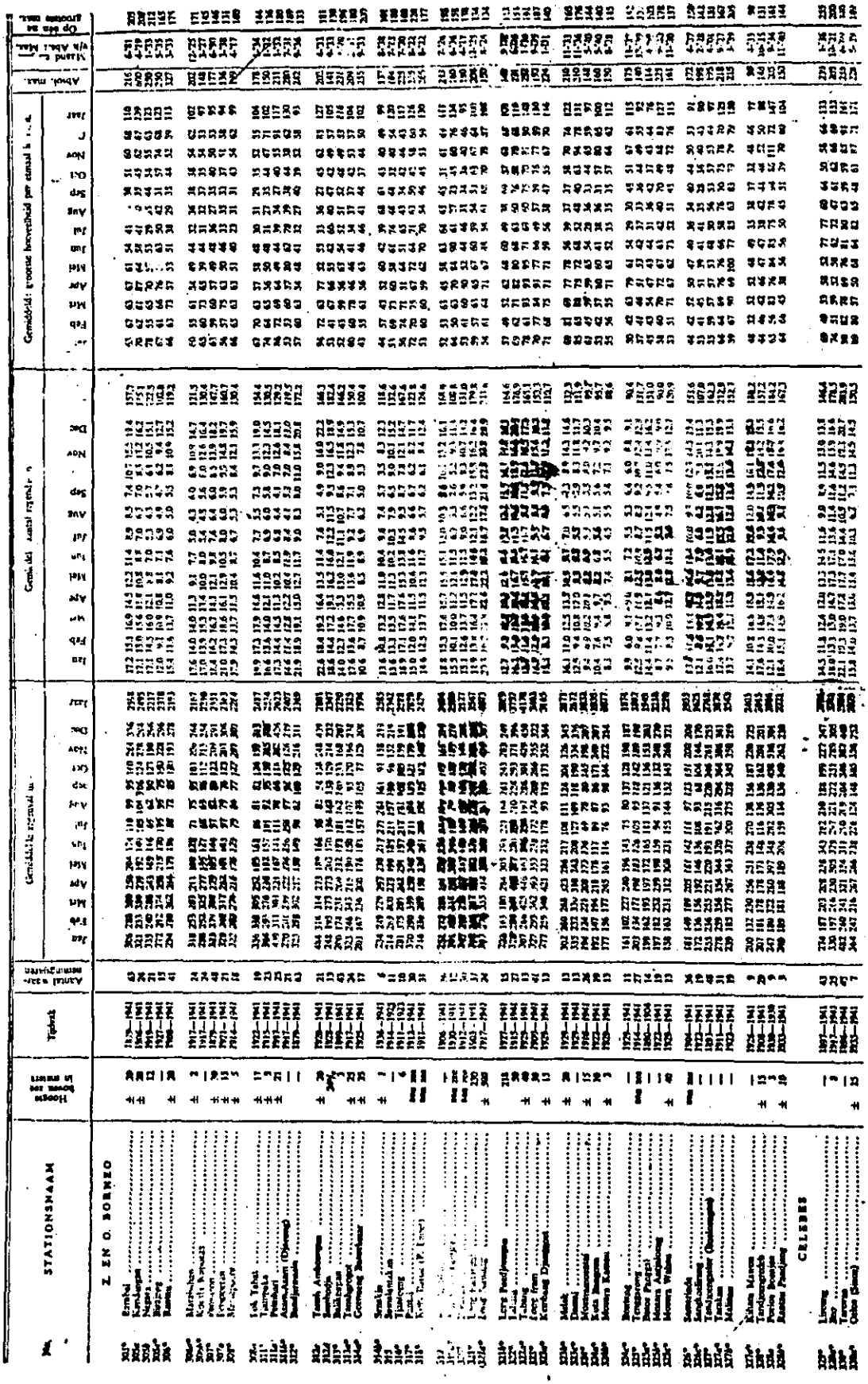
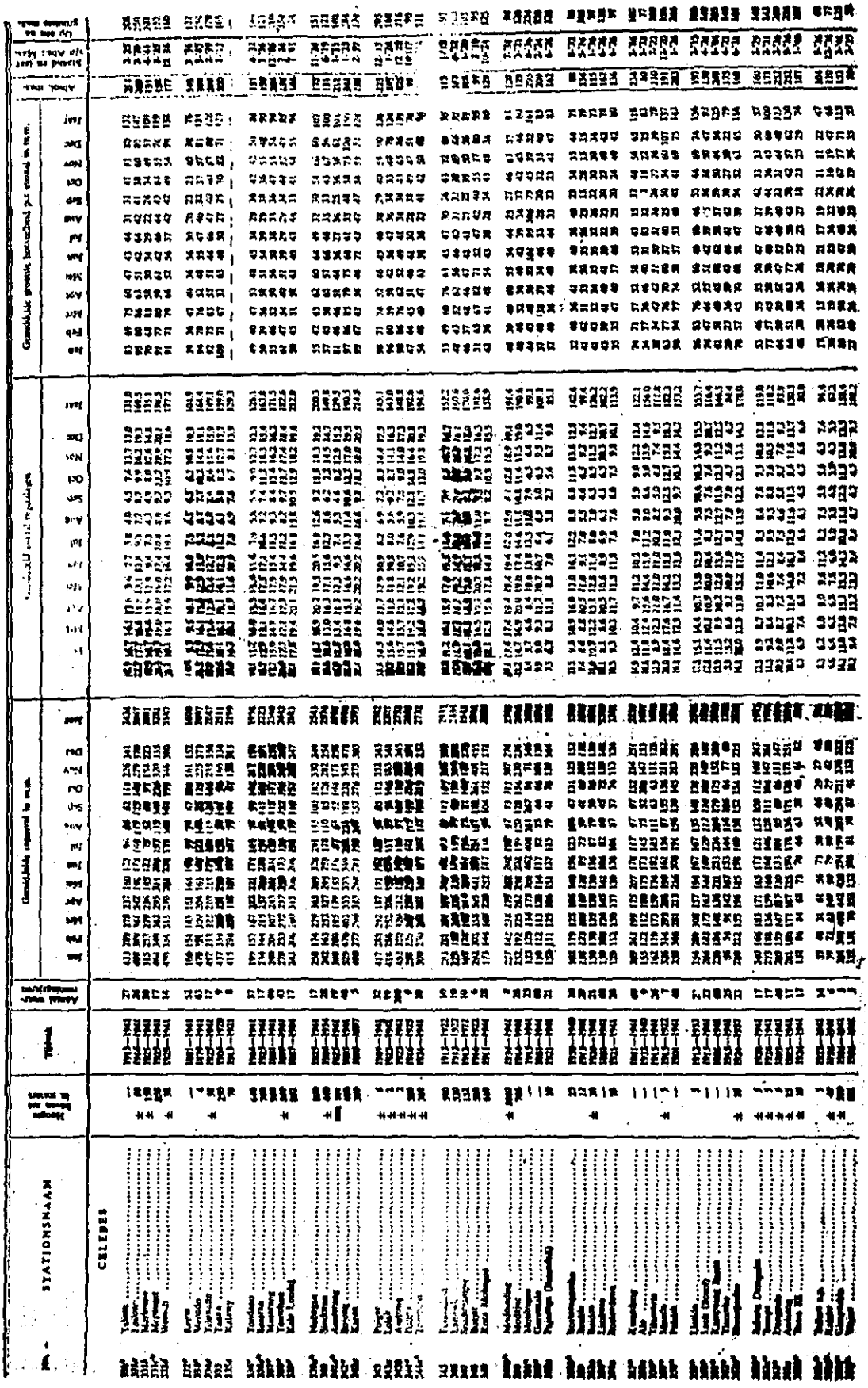


No.	NAMA STASIUN	Tinggi atas permukaan laut m.	Tahun pencatatan	Jumlah tahun pencatatan	Rata-rata tjurah hudjan dalam m.m.													Rata-rata djumlah hari hudjan													Rata-rata tjurah hudjan terbesar selama 24 djam												Kedalaman rata-rata selama 24 djam			Angka perbandingan antara bulan basah dan bulan kering
					Djan	Peb	Mrt	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun	Djan	Peb	Mrt	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun	Djan	Peb	Mrt	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun	mm.	Th.	Bln.	
	DAERAH SULAWESI																																												
391b	Mambié	610	1931—1953	18	234	185	212	252	333	250	226	211	234	216	247	271	2961	14.6	12.8	13.4	17.0	18.4	16.5	14.7	12.1	12.8	12.8	14.9	15.8	177.9	44	44	44	87	82	46	41	46	48	47	50	55	87	184	19-1960	115
222	Messawa	870	1931—1956	10	435	331	299	387	502	255	145	112	153	192	322	416	3540	21.0	16.1	16.8	19.6	20.1	16.9	10.2	8.5	8.1	10.9	17.3	20.2	185.7	68	64	55	68	72	63	48	34	45	52	59	72	97	135	1-1940	126
393	Rantepao	700	1931—1959	16	378	297	476	567	439	283	194	169	226	185	349	452	4015	18.5	16.9	20.6	22.3	18.8	16.7	13.6	12.9	9.3	10.8	17.3	19.8	197.2	71	70	79	93	81	66	55	45	57	63	69	83	112	130	12-1958	150
393a	Lamasie	30	1931—1955	15	187	203	298	365	335	194	220	182	137	160	216	233	2830	15.0	14.8	19.5	18.8	18.4	15.9	13.7	10.6	7.7	9.2	12.7	15.6	171.8	47	57	57	77	68	54	54	44	48	42	61	62	113	245	12-1940	145
394	Palopo	0	1931—1960	24	200	204	285	321	349	287	210	167	150	166	232	225	2779	15.1	14.9	18.9	19.2	18.3	16.6	14.9	12.2	9.3	10.2	12.8	14.5	177.5	82	84	70	67	78	64	54	45	53	58	59	53	114	184	2-1935	183
394b	Nanggala	850	1933—1941	9	345	373	503	522	396	307	185	107	84	143	317	418	3700	18.8	18.0	22.4	22.6	18.3	18.8	12.4	8.7	8.7	9.3	15.6	18.0	191.6	62	75	73	68	70	62	50	32	25	34	61	81	97	125	11-1935	109
395	Makale	775	1931—1941	11	227	173	310	414	322	205	128	62	60	89	207	233	2430	14.5	12.5	19.3	21.9	16.0	14.7	9.9	7.2	6.1	7.9	13.5	14.7	158.8	53	56	59	68	64	50	45	23	26	31	49	51	87	103	5-1933	97
395a	Rantékarua	1400	1932—1940	10	416	408	595	697	475	326	222	134	134	174	338	487	4406	17.9	15.2	23.8	24.9	22.4	19.9	16.9	13.7	10.0	11.1	15.4	21.5	216.1	70	72	79	98	77	60	50	36	39	34	51	68	114	166	4-1936	144
395b	Parandangan	1400	1931—1941	11	659	338	506	541	400	252	204	122	99	134	256	424	3729	19.5	16.7	22.7	23.7	19.7	15.1	11.3	10.1	6.5	8.2	16.8	20.5	191.5	55	64	72	71	69	52	56	32	32	40	67	70	102	127	5-1940	118
395c	Parantesan Baroppo	1300	1931—1941	11	311	370	424	569	436	312	176	108	82	169	300	383	3640	18.3	17.8	20.0	23.2	21.3	17.3	13.8	10.5	7.3	10.1	17.3	20.8	197.7	53	74	66	76	64	63	49	31	21	48	52	66	101	170	2-1932	115
396	Madjene	0	1931—1960	12	241	135	126	139	175	196	71	53	87	110	149	153	1643	12.9	11.1	10.8	12.2	12.8	9.5	5.8	4.1	4.7	8.2	10.6	12.4	115.2	74	48	54	45	60	73	28	31	42	37	46	48	144	420	6-1934	186
397	Tinambung	4	1931—1948	12	206	100	117	149	107	134	80	79	68	128	131	151	1460	12.7	9.9	11.0	12.5	13.5	10.2	6.5	4.2	5.1	9.2	11.6	11.9	119.3	62	41	38	47	45	48	30	24	25	36	40	49	109	182	8-1933	160
398	Tjampalajang	6	1931—1948	12	181	84	129	121	186	137	62	58	62	110	166	95	1280	7.0	5.3	6.6	6.8	7.5	5.3	2.9	2.0	2.5	4.6	6.6	6.3	64.6	46	37	34	44	34	75	29	35	42	36	62	46	159	378	11-1938	223
398a	Kal. Siddédé	—	1938—1952	7	162	161	158	176	202	219	84	18	44	137	180	106	1647	9.2	8.4	9.4	12.0	10.1	8.3	4.8	1.7	2.0	5.2	9.8	8.3	90.2	44	48	29	43	62	86	35	16	27	47	85	36	115	233	11-1938	133
399	Polewali	3	1931—1960	23	164	164	203	244	213	186	83	56	99	196	171	200	1979	10.9	9.9	10.9	12.8	12.0	9.8	6.2	4.5	6.0	11.3	11.3	11.4	176.0	52	53	62	67	62	64	41	25	38	35	49	68	106	167	4-1943	146
399b	Badjo	10	1931—1941	11	126	136	199	291	223	183	144	96	68	72	180	120	1639	9.8	9.4	12.0	16.2	12.6	11.2	10.8	7.7	4.8	6.1	11.1	8.9	121.2	32	38	51	68	55	48	37	23	21	31	51	49	92	140	4-1934	154
400	Enrekang	50	1931—1940	10	203	193	245	317	280	207	106	77	80	88	197	190	2183	15.1	12.6	15.3	18.2	16.2	14.2	9.2	6.7	5.4	9.2	13.3	15.8	151.5	45	51	49	66	58	64	49	27	41	30	66	46	110	164	9-1934	151
400b	Siwa	—	1931—1958	16	95	109	137	203	423	291	241	210	154	165	122	92	2269	6.5	8.0	9.9	11.4	16.0	13.0	11.5	9.4	7.5	8.2	7.3	5.9	114.3	39	46	44	56	52	69	72	61	50	55	45	38	120	200	2-1964	166
400c	Bilokka	25	1931—1941	11	184	136	135	176	264	214	99	52	31	42	103	111	1547	9.5	8.5	9.1	10.7	13.3	12.0	7.4	5.1	3.5	3.9	6.1	7.3	96.4	59	58	64	52	69	72	33	20	13	21	29	37	106	192	1-1938	132
400e	Lasape	15	1931—1941	11	161	135	199	269	264	182	102	74	77	132	155	187	1938	9.7	9.5	10.2	12.1	12.9	9.2	6.5	5.2	3.1	5.5	8.8	9.4	99.1	43	51	58	78	59	54	32	28	45	38	48	56	121	231	9-1934	180
400f	Benteng	—	1927—1960	12	169	183	281	229	342	208	124	99	56	114	167	247	2219	11.6	10.5	13.0	13.5	6.5	11.5	8.8	6.7	5.5	6.8	10.1	13.7	129.1	44	43	64	64	29	58	47	40	27	30	50	54	96	127	4-1941	128
400h	Kera (Lapareppe)	2	1953—1959	7	82	70	104	201	385	427	216	218	260	127	85	112	2287	4.5	4.3	5.0	7.5	9.0	9.8	1.4	7.7	6.6	6.7	3.6	5.6	69.7	22	23	48	70	75	92	65	52	55	37	41	44	136	178	9-1953	172
401	Pinrang	12	1931—1960	18	199	176	200	210	304	190	117	102	90	149	187	232	2157	12.0	11.4	11.2	12.6	14.1	11.4	9.2	8.4	5.6	9.6	11.1	12.9	129.9	58	53	56	55	71	82	38	42	51	45	52	64	125	302	9-1934	151
401a	Mallusetasi	25	1931—1941	11	200	213	242	268	374	238	139	144	122	180	264	152	2544	10.6	8.5	9.9	12.0	14.1	10.9	7.0	7.0	4.7	6.5	9.6	8.4	108.3	57	68	95	67	77	72	54	43	78	56	74	83	160	427	9-1934	224
401b	Maroangin	71	1931—1960	17	179	168	240	274	399	402	246	232	156	148	195	179	2818	10.5	9.5	11.0	12.3	15.6	14.4	11.4	11.3	8.2	8.6	9.0	10.6	132.4	53	54	70	73	93	96	55	61	42	49	51	60	130	260	8-1934	188
401c	Kariango	65	1931—1941	11	207	185	195	239	275	195	63	59	22	170	168	187	1785	9.2	9.4	10.8	12.5	11.1	6.8	4.4	3.9	2.4	3.9	7.9	10.5	92.8	64	47	64	65	76	47	25	19	14	24	46	54	107	151	1-1938	123
401d	Langra	15	1931—1941	11	206	223	265	268	266	136	63	43	64	129	169	301	2282	9.6	8.7	9.6	11.5	9.5	6.4	5.7	3.2	2.4	5.3	8.8	12.7	93.1	85	66	75	72	82	52	34	23	22	44	48	54	87	138	8-1934	147
402	Kappang	22	1931—1957	17	139	136	177	184	318	237	158	142	83	140	184	135	2003	10.1	10.1	10.7	12.2	14.9	15.5	11.8	9.5	5.5	10.1	9.6	9.9	130.0	41	47	49	44	78	63	49	33	22	40	55	49	119	183	6-1939	164
402a	Mario	28	1931—1939	9	150	162	180	261	367	235	187	131	64	161	164	118	2162	10.3	11.8	12.2	16.6	17.2	16.7	12.6	10.4	5.8	9.4	10.7	8.3	141.8	80	49	53	63	77	52	51	44	22	50	53	42	92	138	5-1931	112
402b	Bangka E (Lawawai)	15	1931—1941	11	230	157	164	200	264	187	117	78	40	91	166	136	1950	12.8	10.9	11.4	14.0	15.1	13.4	8.3	6.3	3.9	6.6	10.0	10.2	122.9	74	48	60	52	70	48	38	25	22	29	70	37	114	200	1-1938	154
403a	Tanrutedong	16	1931—1959	17	94	121	146	201	354	286	207	148	84	107	132	85	1965	7.3	7.3	9.3	12.3	14.2	13.1	10.6	9.2	5.2	8.3	8.5	5.9	111.2	22	46	52	52	79	65	61	57	33	35	43	36	125	219	7-1960	176
403b	Balamalimpang Anabanua	40	1931—1960	19	81	96	136	210	360	288	174	121	80	98	112	93	1859	5.2	5.1	8.4	10.1	15.0	12.6	9.9	7.2	4.7	6.2	7.6	6.2	96.2	36	41	52	61	89	78	54	45	33	28	33	34	114	183	6-1940	168
403c	Pangkadjene	12	1931—1941	11	156	99	127	214	274	179	112	77	37	79	106	97	1551	8.1	7.7	8.9	10.4	11.6	10.7	8.7	4.9	3.1	3.8	6.1	6.6	96.7	55	39	51	60	73	56	39	38	18	31	36	31	99	156	1-1938	146
404	Paréparé	2	1932—1948	14	422	285	256	251	231	192	70	71	56	93	250	330	2562	16.5	12.8	12.4	12.1	12.5	9.7	6.6	4.4	3.1	8.1	11.6	14.3	125.9	102	72	78	67	67	39	45	31	22	28	32	82	141	216	11-1948	286
404b	Paria	60	1931—1960	19	49	114	151	259	507	354	224	188	100	128	172	185	2442	4.2	5.7	7.1	10.6	15.5	11.6	8.3	7.7	4.2	5.6	7.3	5.4	93.3	37	49	52	79	105	82	67	50	47	42	34	66	121	143	4-1932	196
404c	Amparita	15	1931—1956	16	170	122	161	168	217	207	118	80	34	67	119	126	1619	9.0	8.4	9.5	11.3	13.5	11.8	8.1	5.1	2.3	4.7	7.7	8.3	110.3	61	45	58	46	57	67	41	23	19	24	28	53	113	204	10-1955	189
404d	Palanro	2	1932—1941	11	534	228	258	223	227	103	90	51	38	145	336	467	2920	14.2	9.9	10.8	7.5	7.2	4.8	2.6	1.6	1.7	5.1	9.5	11.3	105.3	105	51	58	75	72	55	32	29	28	42	58	108	187	256	3-1935	215
404e	Mangkoso	3	1932—1959	22	485	377	309	218	178	106	55	49	41	112	302	522	2755	14.8	12.6	12.6	8.5	8.6	5.4	3.2	2.4	4.6	6.8	12.2	15.6	117.3	102	97	82	71	65	50	27	22	21	41	81	110	147	220	12-1954	206
405	Singkang	12	1931—1960	19	188	91	128	181	221	234	152	102	62	89	124	101	1884	7.5	6.6	9.0	11.5	17.1	14.0	10.5	8.2	4.3	6.4	7.5	7.9	110.5	29	37	46	56	76	52	42	24	24	27	41	58	84	184	8-1936	232
405a	Belawa	9	1931—1960	18	125	96	115	165	220	253	142	68	50	75	130	92	1620	7.8	6.7	8.3	10.0	14.3	13.1	10.5	8.3	4.2	5.2	8.7	7.1	101.4	46	35	42	45	77	72	38	33	21	22	44	32	109	122	1-1938	148
405b	Ka E (Salepekka E)	—	1931—1941	11	141	106	151	191	289	227	144	68	30	86	132	121	1686	9.6	8.5	10.5	15.0	16.3	13.9	8.0	6.3	2.1	5.5	8.7	8.0	113.4	45	44	48	55	67	51	41	21	12	24	40	34	103	135	1-1938	130
405c	Baiobeta	20	1931—1960	22	113	130	143	182	301	220	119	96	38	62	121	116	1635	6.6	6.4	7.8	9.0	11.7	9.0	6.4	5.1	2.1	3.3	6.9	6.6	81.2	34	46	52	52	74	45	37	25	22	22	44	29	101	175	5-1933	153
406d	Watangpanaiki	20	1931—1941	16	128	117	144	216	448	333	241	176	82	125	176	136	2472	7.2	7.9	9.1	14.8	18.2	14.6	10.8	9.6	4.2	7.7	10.2	8.0	122.1	48	40	43	55	92	77	58	54	40	41	46	37	125	189	6-1933	180
406e	Tjaro	42	1933—1960	8	90	104	115	169	263	195	129	129	49	100	103	110	1548	8.0	8.2	8.5	10.4	15.3	12.1	11.8	10.4	4.1	6.9	9.3	8.6	103.7	32	32	44	44	82	55	31	29	25	28	34	35	77	101	5-1959	77
406f	Tantjung	25	1932—1960	8	89	83	155	136	263	231	193	154	111	119	137	105	1776	6.0	6.6	8.7	7.7	13.9	14.0	9.9	7.3	6.0	5.9	8.4	8.5	103.4	36	19	46	48	75	42	52	36	32	38	33	36	144	6-1944	90
406	Pampanua	15	1931—1941	11	93	145	139	258	355	245	148	102	40	82	133	141	1882	9.1	8.9	11.2	16.3	19.6	17.0	11.5	9.1	3.9	5.3	10.0	10.6	123.0	37	40	42	64	73	53	36	25	17	28	43	42	102	160	4-1934	128
406a	Palima	—	1931—1948	12	118	115	172	267	409	303	178	75	41	103	111	90	1981	8.0	7.1	8.8	13.8	17.3	13.1	8.4	5.2	2.9	5.2	6.8	6.3	103.0	34	46	50	55	79	65	44	28	22	29	38	32	88	122	8-1932	113
407	Watansoppeng	120	1931—1960	22	167	169	184	236	283	203	146	74	42	84	144	107	1885	9.7	9.4	9.7	11.4	14.6	12.5	9.3	5.6	3.3	5.3	9.1	10.3	110.0	41	51	52	52	72	55	44	29	22	32	43	47	104	230	8-1934	141
408	Sumpangbinangae	2	1931—1958	23	405	305	311	229	174	90	66	389	28	100	280	467	2804	16.0	12.5	13.9	10.0	9.0	5.8	3.7	2.4	2.4	6.0	11.5	15.5	109.0	104	77	86	71	56	39	23	20	14	30	34	84	107	184	270	12-1954	209
409	Segeri	3	1931—1960	20	634	490	377	312	223	120	70	37	37	168	269	625	3472	17.9	14.6	12.8	12.3	11.2	7.1	4.3	2.5	2.1	9.1	13.8	17.6	126.3	196	96	90	82	97	48	27	21	19	48	51	96	176	400	1-1934	238
409a	Takalala	70	1931—1960	22	141	141	128	172	232	179	127	58	41	66	116	126	1529	10.1	9.0	8.6	10.4	12.6	11.0	8.7	5.0	3.0	4.9	8.0	9.6	101.0	31	43	43	51	68	47	44	20	19	32	35	41	91	146	7-1931	125
410	Udjungjamuru	400	1931—1941	11	152	136	161	225	242	295	122	74	38	58	131	125	1658	11.5	10.6	9.8	14.8	19.0	17.1	10.8	7.0	2.5	3.8	8.5	9.9	125.3	29	49	59	83	88	52	28	17	30	42	32	96	146	8-1933	176
410a	Loeroeng	85	1931—1959	13	130	185	217	293	306	412	233	115	60	64	148	236	2699	9.5	10.5	11.8	15.3	18.3	16.3	11.3	9.0	3.9	4.8	9.2	10.7	130.2	40	53	53	88	115	105	71	34	31	30	44	70	137	195	4-1935	193
410b	Tatipi	1	1931—1941	11	127	102	187	339	46	311	191	96	49	52	134	186	1901	9.0	9.6	9.4	13.5	15.1	12.6	9.1	5.3	2.4	3.0	8.2	9.0	105.2	50	47	56	73	87	78	63	22	22	15	36	49	118	161	8-1940	160
410c	Matjopo	13	1937—1960	7	135	133	183	338	541	326	208	168	89	47	145	196	2413	11.1	10.6	14.7	18.7	23.1	19.1	15.2	9.6	6.5	4.3	9.7	14.7	157.3	38	37	45	48	90	69	64	31	21	19	42	42	103	161	7-1949	180
410d	Kampengtoro	197	1936—1960	8	131	111	205	292	525	390	193	112	72	36	141	158	2362	9.2	8.4	11.9	14.8	18.2	16.1	10.9	7.0	3.6	2.3	6.9	9.0	118.4	36	43	59	65	111	106	48	46	29	22	59	46	125	250	8-1959	167
411	Watampone	20	1932—1959	22	188	146	182	259	427	344	271	124	84	94	128	145	2396	10.5	9.2	10.9	13.9	15.7	15.9	12.5	8.5	5.3	5.6	7.6	8.0	124.2	50	50	61	63	94	87	74	40	35	41	63	45	118	163	6-1927	160
412	Maros	300	1936—1959	15	125	122	153	278	577	320	264	117	81	77	127	92	2514	10.4	8.7	11.1	13.6	20.1	17.9	12.5	6.1	3.6	4.7	8.5	6.6	132.9	35	39	48	86	109	102	82	52	23	37	47	39	114	228	8-1956	199
412a	Tjamming	107	1931—1941	10	134	144	164	231	429	356	172	97	35	69	88	156	2068	8.3	7.9	7.9	10.0	13.8	10.8	8.1	5.8	2.2	2.3	4.9	8.5	88.0	74	41	42	75	108	107	63	23	19	38	32	63	181	300	6-1936	200
412b	Gantagsutarang	24	1931—1941	11	656	431	296	276	177	73	41	26	5	74	258	471	2873	19.9	14.1	15.8	12.0	10.4	6.3	3.3	1.8	0.8	4.1	10.3	15.0	113.5	118	102	94	89	56	32	17	17	4	22	70	31	139	283	1-1939	219

No.	NAMA STASIUN	Tinggi atas permukaan Laut m.	Tahun pengamatan	Djumlah tahun pengamatan	Rata-rata tjurah hudjan dalam m.m.													Rata-rata djumlah hari hudjan													Rata-rata tjurah hudjan terbesar selama 24 djam												Angka perbandingan antara tjurah hudjan maksimum dan minimum	Angka perbandingan antara tjurah hudjan maksimum dan rata-rata
					Djan	Peb	Mrt.	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun	Djan	Peb	Mrt	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun	Djan	Peb	Mrt	Apr	Mei	Djun	Djul	Agt	Sep	Okt	Nop	Des	Setahun		
	DAERAH SULAWESI																																											
413	Pangkadjene C.B.	3	1931—1958	22	696	521	357	246	187	98	56	52	21	91	326	536	3186	18.6	14.5	13.1	9.0	7.8	12.0	2.7	1.5	1.9	5.0	11.1	16.7	113.9	121	109	83	73	64	39	29	22	14	40	56	100	157	244	1-1922	240
414	Maros	8	1931—1960	17	749	547	400	275	190	105	57	30	25	60	268	615	3241	22.2	16.2	16.7	12.1	12.5	8.7	2.8	2.3	1.9	4.6	13.9	20.6	138.5	126	128	97	87	55	34	28	15	17	24	75	101	173	226	1-1922	215
415a	Amarang	25	1931—1956	13	851	525	443	304	227	172	76	39	19	92	317	552	3607	23.8	16.8	18.1	16.0	14.6	11.4	6.3	3.8	2.2	6.2	16.4	21.7	157.4	121	118	93	56	46	46	30	12	12	29	67	94	162	241	1-1935	223
415b	Bontokappong	8	1931—1953	12	817	558	472	305	222	101	61	23	16	88	243	566	3592	24.8	19.1	16.7	15.2	13.5	10.1	4.8	2.3	2.0	5.5	15.2	20.9	162.2	127	124	98	74	53	33	22	13	10	27	82	93	176	276	1-1928	247
415c	Mandai	15	1947—1960	14	572	563	378	177	242	87	68	49	35	127	275	614	3188	22.7	20.6	17.6	10.4	13.7	9.3	6.2	4.6	3.6	9.2	16.5	24.5	161.0	193	116	88	72	76	31	27	23	21	43	58	104	153	246	0-1947	231
416	Tjamba	300	1931—1941	11	423	211	265	255	227	182	77	57	37	56	135	248	2277	20.5	14.6	15.5	14.7	14.7	11.2	6.6	4.2	2.1	3.5	8.8	16.9	136.3	73	63	45	52	39	47	32	23	18	29	35	44	122	215	3-1935	192
417	Maraida	290	1931—1941	11	142	163	239	226	417	368	172	102	49	69	92	775	2104	13.4	10.9	10.6	13.5	18.1	17.7	13.7	7.9	3.5	3.4	8.4	12.4	133.5	33	49	43	57	113	84	62	38	22	19	21	46	144	281	8-1933	213
417a	Badjo	20	1931—1941	11	110	78	117	283	642	459	239	101	60	47	70	99	2328	7.6	6.5	7.4	11.3	19.8	18.6	11.1	6.2	3.0	3.3	4.3	5.4	100.5	40	24	41	71	102	99	63	42	23	17	23	46	115	166	8-1931	163
418	Sindjai (Balangnipa)	—	1931—1960	29	111	110	153	273	558	509	299	127	62	50	95	112	2378	8.4	8.4	9.9	10.8	16.7	18.9	11.2	6.4	3.4	3.4	5.2	7.7	107.4	31	38	46	49	116	109	76	51	34	22	39	31	129	304	0-1940	196
419	Mampi	750	1931—1941	11	205	180	197	255	522	442	254	125	67	60	127	205	2639	16.3	13.9	15.4	16.0	21.2	18.6	14.6	10.3	5.6	4.4	10.1	13.8	162.4	44	37	38	52	99	70	72	37	24	21	27	49	118	171	8-1938	154
419a	Tombolo	1000	1931—1941	11	459	324	332	222	360	296	161	111	69	40	147	273	2628	27.3	15.9	16.5	16.0	17.7	16.5	10.8	6.9	3.2	3.8	10.1	18.4	158.1	65	62	51	41	89	63	53	33	28	16	41	46	129	196	2-1933	151
419b	Lombazaang	1021	1931—1960	17	890	707	560	445	301	163	102	62	32	49	296	615	4168	26.5	22.5	23.6	21.1	18.2	13.6	7.8	3.7	2.6	4.7	15.3	25.1	194.8	121	110	96	73	56	37	34	29	17	19	49	86	172	252	3-1935	216
420	Bikeru	250	1931—1941	11	277	212	311	293	665	567	228	129	46	67	113	223	3480	12.5	11.0	13.6	13.8	19.0	16.8	9.3	4.2	2.1	2.6	6.5	11.6	123.0	56	60	54	90	96	120	71	34	21	32	23	83	147	240	8-1939	186
420a	Balombiasie	350	1931—1952	16	296	232	368	322	560	439	256	116	58	87	184	274	3206	22.0	18.8	20.6	17.4	21.4	18.4	16.8	9.5	5.3	6.0	10.0	17.2	184.4	58	65	65	75	95	100	66	42	24	56	134	135	8-1929	193
420b	Balangriri	—	1931—1953	17	289	227	336	320	544	463	270	121	52	82	129	244	3066	21.2	19.2	20.2	18.5	22.0	19.9	16.7	8.9	5.4	5.5	10.8	17.1	185.5	51	47	64	77	105	109	71	45	27	34	25	56	141	225	8-1941	190
421	Kadjang	8	1931—1954	14	163	125	184	311	486	320	197	64	28	52	101	121	2352	8.9	7.8	9.2	11.9	15.4	12.6	7.9	3.9	2.1	2.9	5.8	7.8	96.0	56	40	46	72	105	127	63	29	15	28	29	38	157	231	6-1954	213
422	Makassar (K.R.P.)	2	1931—1960	22	725	501	408	186	118	69	34	24	7	50	189	550	2853	14.0	10.3	12.2	9.7	9.3	6.5	3.8	2.4	1.5	5.0	12.1	14.5	131.1	118	95	87	62	49	38	19	15	15	23	69	99	144	225	8-1954	209
422a	Makassar (Ir.)	3	1931—1957	21	633	463	355	178	106	59	37	19	9	44	160	514	2561	23.6	17.5	16.2	9.5	7.6	5.9	3.7	2.3	1.2	4.6	10.5	13.9	123.0	107	104	74	65	41	31	18	9	7	20	56	84	142	222	4-1939	209
422b	Makassar (Ptr. Air Minum)	6	1931—1960	22	671	459	354	219	109	79	34	25	16	42	169	526	2697	21.4	16.8	18.8	7.5	6.7	4.7	2.6	1.5	1.0	2.1	7.8	14.7	107.7	106	106	83	76	48	38	20	16	8	23	65	110	161	212	2-1937	190
423	Sungguminasa	5	1931—1960	23	689	510	365	173	122	76	48	27	11	52	212	518	2783	20.2	16.3	14.2	7.7	7.8	5.6	3.4	2.4	1.0	3.7	10.2	13.9	111.6	102	96	79	65	45	38	24	15	8	22	60	98	150	248	6-1954	238
423a	Pangentungan	16	1917—1959	13	512	462	293	109	112	81	52	22	23	76	212	594	2534	19.2	17.6	13.4	6.6	7.7	5.4	3.5	1.9	1.7	5.8	11.1	21.1	115.0	88	92	61	54	43	23	20	18	13	27	62	103	125	206	11-1955	178
424b	Tanete	56	1924—1949	10	923	644	497	364	240	137	75	23	24	46	244	513	3721	26.2	21.4	22.5	20.2	15.1	11.4	6.1	3.0	4.1	4.7	14.6	22.8	68.2	119	100	86	67	38	38	24	10	13	19	61	71	151	235	3-1935	214
424c	Bilibili	56	1931—1940	10	857	457	451	345	264	158	56	44	25	76	255	496	3440	26.0	19.1	19.3	18.4	15.2	11.0	5.6	4.2	2.6	6.8	16.4	22.7	168.0	118	96	96	73	72	52	18	22	14	25	49	101	156	217	3-1932	210
424e	Borongrapoa	810	1931—1951	14	348	257	345	292	671	529	321	191	72	58	190	361	3983	12.3	10.3	20.9	14.9	21.3	19.9	18.6	11.1	4.2	4.9	12.3	18.7	198.8	55	71	65	80	106	121	83	56	27	31	58	70	115	227	6-1931	225
424f	Banto - Bili-bili	45	1922—1959	8	613	602	389	196	310	154	70	126	23	103	537	761	4078	22.6	20.8	17.4	13.7	15.1	9.8	8.3	8.3	3.4	7.9	19.3	23.6	172.9	107	113	83	76	85	51	24	43	26	53	102	124	155	200	1-1959	182
425	Limbung	10	1932—1941	10	766	401	399	168	111	63	29	25	14	54	161	449	2640	20.3	11.4	12.6	8.0	6.0	4.3	1.9	0.8	0.9	3.3	9.2	16.5	93.2	135	101	107	54	19	31	13	21	10	24	49	105	172	245	3-1940	220
426	Takalar	—	1931—1960	18	546	362	265	107	105	47	21	14	8	43	164	370	2074	18.0	12.6	11.9	6.5	6.4	3.9	1.8	1.6	1.0	3.2	9.5	15.1	92.0	91	90	72	46	39	25	21	9	7	21	53	87	123	182	1-1959	173
427	Abd	3	1931—1960	15	421	296	176	111	55	49	28	8	7	26	151	287	1616	14.9	12.6	9.1	6.6	3.4	2.4	1.8	0.4	0.5	1.7	7.2	12.4	76.0	59	70	54	40	32	25	13	4	4	13	61	75	115	217	11-1933	173
428	Batumalle	16	1931—1956	13	281	600	416	354	263	134	84	36	26	108	318	557	2807	27.0	20.2	19.3	18.2	14.8	13.9	7.1	3.9	2.3	6.5	17.8	23.2	174.2	131	116	90	78	72	40	34	15	16	49	78	91	178	271	3-1935	280
429	Djeneponto	—	1931—1960	19	283	200	119	85	92	100	55	20	8	7	53	177	1199	11.6	8.4	6.5	5.6	5.8	6.0	4.0	1.4	0.5	1.3	3.6	8.4	62.1	60	61	52	41	33	42	24	10	7	8	26	55	106	160	3-1933	150
431	Malakadji	750	1931—1960	22	323	290	224	299	219	151	69	37	7	5	227	235	2165	16.5	15.1	13.6	14.9	13.3	9.6	4.6	2.8	1.4	2.4	11.4	16.5	122.1	50	57	62	67	47	49	25	9	10	18	53	61	105	178	3-1958	167
431a	Loka	1160	1931—1941	11	332	257	275	334	309	271	125	95	56	42	208	362	2636	20.0	15.9	14.5	16.2	18.6	16.9	9.4	5.9	2.2	3.8	13.9	19.6	159.9	62	58	67	62	64	58	51	30	15	20	58	72	120	200	7-1931	180
431c	Balangie E	4	1931—1941	11	156	131	95	95	138	162	81	29	21	18	58	102	1038	10.5	7.5	7.4	6.4	9.2	8.4	3.5	1.9	0.9	1.5	2.9	7.0	68.5	39	51	38	34	42	36	25	17	16	10	30	33	80	106	11-1941	100
432	Bontbain	—	1931—1960	24	143	120	112	128	221	204	115	72	19	41	47	129	1362	12.2	10.1	9.2	8.9	12.6	12.4	8.6	4.2	2.0	3.6	6.6	12.8	102.2	62	56	45	42	42	45	29	14	17	28	42	106	181	8-1955	168
434	Bulukumba	9	1931—1960	23	106	89	100	167	309	217	137	52	23	38	37	63	1440	8.5	6.8	7.0	8.8	13.2	12.4	7.1	3.5	1.6	2.6	2.9	6.0	80.4	35	36	21	47	72	83	39	24	17	19	20	25	108	207	6-1960	173
434a	Batangmata	0	1931—1960	18	85	70	89	185	274	212	89	36	5	26	88	154	1225	6.6	6.0	5.5	10.8	13.4	11.2	5.5	2.5	0.7	1.5	5.9	8.5	78.1	22	21	24	45	61	59	27	16	4	19	15	49	92	200	6-1939	160
435	Saleier	—	1931—1960	18	231	129	140	214	221	206	120	62	7	34	136	294	1806	14.1	9.8	10.2	11.5	16.2	12.6	8.1	5.7	1.2	2.8	9.4	14.5	116.1	63	41	38	57	62	61	39	22	11	18	15	112	192	12-1938	157
435a	Djampea	4	1931—1954	12	534	255	232	201	155	82	21	13	7	19	95	379	2003	17.6	11.9	12.3	12.5	10.1	8.3	2.4	1.3	0.9	1.0	6.2	15.8	98.3	78	47	46	35	34	25	7	6	5	13	28	55	83	156	1-1927	119
435b	Labuan Maruge	4	1931—1941	11	457	295	257	175	103	115	60	26	9	14	73	261	1812	22.9	19.9	17.8	14.8	11.7	9.3	6.0	2.3	0	0.9	6.0	17.6	130.2	84	62	53	60	37	30	17	19	0	9	36	66	122	190	3-1933	167
435c	P. Salabasa	4	1931—1941	11	378	180	221	141	85	91	49	15	1	70	72	197	1495	20.3	15.5	16.5	10.8	11.2	9.1	4.7	2.5	0.2	1.2	6.9	13.3	112.2	70	50	39	36	29	23	21	11	1	5	29	52	90	148	2-1929	135
	DAERAH NUSA-TENGGARA																																											
437	Negara	8	1931—1960	20	225	225	179	142	56	84	103	58	57	124	195	250	1758	10.9	10.8	9.6	7.8	5.1	5.2	5.2	4.4	2.5	6.4	9.5	11.5	90.2	62	67	56	53	40	34	25	22	19	57	57	72	124	173	7-1957	165
437b	Grogak	45	1931—1960	23	273	210	226	113	65	71	32	21	3	17	81	190	1392	15.4	16.3	13.2	9.4	6.3	4.7	3.5	1.4	0.7	1.7	5.5	11.4	90.7	67	57	58	54	40	35	25	18	4	9	25	63	94	164	1-1958	121
437c	Pulukan	80	1948—1960	11	250	280	183	118	120	105	115	77	106	140	303	294	2075	13.3	11.9	10.5	6.6	5.3	6.6	4.8	4.4	5.6	7.3	13.2	13.9	102.5	56	71	68	68	54	34	32	33	34	32	53	71	111	188	11-1952	182
438	Buleleng	60	1931—1959	19	254	231	224	119	73	25	40	*	2	6	70	151	1216	15.9	13.6	11.5	7.4	4.8	3.2	2.4	1.4	0.7	1.1	5.2	11.5	78.9	61	56	57	39	26	16	15	7	2	5	23	38	97	188	3-1933	231
438b	Pengotan	1148	1931—1954	14	488	379	370	206	92	81	67	35	22	57	166	397	2370	22.9	19.0	17.7	12.4	8.5	6.5	7.3	4.8	3.0	5.5	13.5	19.9	141.0	87	70	68	51	32	28	21	16	13	27	44	64	105	140	1-1933	133
438d	Bondalem	20	1931—1960	29	373	309	274	122	79	56	28	11	5	5	78	171	1825	17.5	15.5	13.8	7.4	5.1	3.7	1.9	1.2	0.5	0.8	4.6	11.6	83.6	80	61	67	41	37	25	17	6	4	9	23	51	122	171	2-1933	167
438e	Berangtambok	30	1949—1960	12	323	204	189	107	90	63	60	19	9	8	50	168	1243	13.6	12.8	10.3	3.9	4.7	2.8	2.9	0.6	0.0	0.3	3.2	7.8	62.3	69	44	30	22	15	14	10	9	9	4	9	20	48	90	150	8-1955	98
438f	Bukanadi	90	1949—1960	12	331	312	252	102	93	65	47	31	9	30	103	168	1571	18.3	18.2	14.9	8.4	7.5	4.8	3.5	1.8	1.0	2.5	7.7	12.7	101.3	79	67	59	33	30	29	18	19	6	14	35	54	98	184	1-1943	136
438g	Seririt	—	1950—1960	11	210	234	198	59	42	52	23	40	6	20	87	146	1129	11.9	12.8	9.0	4.8	3.3	3.1	3.2	2.1	0.8	2.4	5.8	9.1	68.2	53	55	66	27	23	20	16	21	3	10	27	31	105	227	8-1956	170
439	Munduk	730	1931—1960	21	428	388	336	260	133	118	58	75	29	71	139	377	2422	18.7	18.6	17.2	15.0	10.4	7.7	3.5	3.1	3.1	6.4	14.5	19.2	140.4	73	63	62	43	31	23	15	21	19	21	48	58	89	145	8-1941	122
439a	Tjandikuning	1247	1949—1960	10	604	422	356	180	133	90	129	54	61	111	373	358	2806	18.3	19.4	17.5	12.3	13.6	8.3	7.8	5.7	4.5	7.9	18.1	19.8	158.2	106	88	68	38	41	28	22	19	27	28	58	160	236	1-1940	153
439b	Baturiti	858	1931—1960	20	399	297	256	300	272	168	156	105	68	171	314	470	3186	18.8	17.6	17.1	14.4	12.1	10.7	9.3	6.4	5.9	9.3	18.1	19.7	156.6	97	71	71	67	59	45	34	22	25	34	55	81	133	218	10-1956	142
439c	Bedjra	160	1931—1960	22	311	240	178	121	116	92	129	71	66	131	256	243	1962	11.2	9.0	8.7	6.5	6.2	5.5	6.0	3.7	3.6	5.9	11.1	10.2	87.6	83	61	54	48	48	36	35	23	29	41	59	89	105	188	2-1934	166
440	Tabanan	120	1931—1960	22	352	239	201	120	146	130	165	84	58	146	240	258	2149	13.5	12.1	11.3	7.2	6.9	6.8	6.2	4.3	4.1	6.8	10.7	12.0	101.9	99	80	55	48	55	48	46	36	31	56	66	93	149	215	1-1956	214
440a	Blahbiah	270	1931—1960	20	363	251	219	148	164	169	208	101	72	166	229	304	2436	13.6	12.2	10.4	7.3	8.4	8.5	9.1	5.4	4.2	7.9	10.4	12.3	110.2	58	61	54	51	61	42	30	35	28	32	79	72	150	375	1-1932	215
440b	Tjaranggesri	300	1931—1941	11	302	310	274	206	165	164	190	55	64	215	320	341	2621	17.4	15.7	15.1	11.2	10.2	11.9	10.7	8.0	6.6	6.6	13.2	15.5	141.2	64	63	51	56	49	49	45	22	32	60	83	61	113	210	10-1936	174
440c	Manukaja	800	1931—1960	20	222	177	158	173	105	118	154	53	71	125	225	300	2222	14.9	14.2	12.1	9.9	7.1	7.1	6.9	4.8	4.3	8.3	12.2	15.7	119.5	62	51	43	36	33	29	21	23	28	41	73	103	210	7-1965	162
440d	Bangkiet	800	1931—1941	11	515	383	460	336	125	123	103	42	34	91	216	437	2868	23.6	19.2	18.6	16.7	9.3	9.1	8.2	5.3	2.3	5.9	13.9	20.6	152.7	79	72	50	61	42	43	30	19	13	32	46	64	119	202	3-1941	141
441	Papuan	800	1931—1960	22	413	296	304	263	199	137	107	65	44	131	281	372	2762	17.5	16.0	15.3	13.7	11.9	7.2	5.4	3.1	2.7	6.9	15.3	17.3	131.3	85	84	68	59	55	44	33	26	19	44	68	70	116	210	3-1956	176





No.	STATIONSNAAM	Hoogte boven zee in meters	Tijdvak	Aantal waarnemingsjaren	Gemiddelde regenval in mm.												Gemiddeld aantal regendagen												Gemiddelde grootste hoeveelheid per etmaal in mm.												Absol. max.	Maand. max. per jaar	Grootste max.
					Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jaar												Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jaar			
	CELEBES																																											
364°	Palos		1908—1941	33	47	36	35	49	99	66	47	31	47	53	45	61	567	16	6.0	3.9	6.5	7.7	8.5	7.6	7.2	7.2	5.3	5.6	5.5	77.9	17	17	14	21	19	23	16	20	16	15	19	19	21	95	12/30	30
364a°	Kal. Naporuh	10		23	83	140	102	148	170	147	214	157	181	179	111	83	1576	13	9.3	10.9	11.9	14.9	15.2	12.4	11.8	11.5	10.8	11.8	8.9	134.4	19	18	19	20	21	22	19	22	18	18	18	18	22	139	12/24	24
364b°	Kaporos	525		21	105	119	139	179	187	172	187	169	174	124	131	121	1797	11	11.2	13.1	14.5	15.5	15.3	16.5	15.3	15.0	11.3	12.4	10.2	16.7	12	11	12	16	19	19	17	15	15	12	14	12	19	85	6/08	79
364c°	Bora	30	1923—1941	18	92	53	98	96	123	176	98	112	115	80	57	61	1042	6.4	6.7	7.9	9.8	12.4	12.8	8.5	8.4	10.1	7.4	6.6	6.2	105.6	21	22	22	31	28	35	22	25	23	21	27	23	35	233	12/30	107
364d°	Palos a.	300	1925—1936	11	90	59	56	114	109	91	59	56	57	77	107	53	1143	10.7	9.0	7.7	11.7	11.0	10.7	8.6	7.2	7.2	4.8	6.7	9.2	103.5	22	25	20	21	27	25	24	25	26	27	27	20	69	167	11/26	63
364e°	Palos b.	250	1925—1936	11	167	136	125	148	146	119	120	122	111	108	170	115	1579																													
364f°	Palos c.	1000	1925—1936	11	188	195	166	192	205	154	132	167	146	130	167	163	1992																											
364g°	Kaporos	300	1927—1941	15	57	57	80	70	100	105	80	77	85	80	58	69	877																											
365°	Patak	6	1915—1941	27	72	75	108	108	108	102	100	108	108	102	102	96	1302	7.1	6.4	7.7	10.3	12.1	11.8	12.6	11.4	9.1	8.5	7.1	5.3	110.6	32	30	33	43	49	57	51	53	47	41	35	33	86	148	7/26	124
366°	Onru Onsa	3	1916—1941	23	150	111	220	300	402	300	270	270	300	300	300	230	3374	7.5	7.5	12.0	14.2	17.3	18.1	16.2	11.5	11.0	11.4	12.5	7.8	146.9	46	37	60	63	78	92	78	67	71	59	58	56	129	223	7/49	177
367°	Limuuk	2	1908—1941	32	69	86	98	136	108	116	86	59	57	38	65	93	955	5.1	6.3	9.4	11.9	9.8	9.0	9.5	6.4	7.8	3.9	7.0	8.6	94.9	25	24	31	35	35	37	36	22	9	16	21	28	47	108	7/29	67
367a°	Bakunak	3	1933—1941	9	72	38	142	165	166	138	153	91	72	38	65	90	1268	6.6	3.8	7.3	16.2	9.6	8.6	7.4	6.1	3.9	3.1	5.2	5.0	73.9	31	28	48	35	56	36	31	16	15	22	26	34	56	171	7/31	111
368°	Benggil	25	1913—1941	29	130	104	208	220	295	292	262	195	167	116	130	76	2223	8.9	7.2	11.1	13.0	13.7	10.6	8.9	6.3	5.3	6.0	6.4	103.3	38	31	48	44	52	50	47	43	41	44	35	28	54	140	6/39	125
368a°	Talabosi	9	1933—1941	9	202	186	240	332	357	238	264	265	264	265	264	173	3036	13.2	10.7	18.5	19.4	20.7	21.3	20.1	12.6	6.9	6.2	11.1	181.4	46	38	59	57	86	127	115	110	57	36	31	37	127	265	7/35	220
368b°	Dasar	400	1936—1941	5	259	211	222	288	424	288	259	265	278	278	278	215	2975	16.6	12.8	13.2	17.4	17.5	15.2	18.2	16.2	8.0	2.2	6.8	14.2	152.2	60	64	58	53	79	85	99	91	55	26	21	37	125	281	8/36	225
369°	Kolondale	1	1908—1941	32	229	209	229	309	408	293	255	206	233	174	199	271	3416	18.2	15.7	19.3	19.5	17.8	19.7	16.1	11.5	9.6	11.9	13.9	181.0	56	58	63	72	81	68	61	59	64	52	53	65	122	291	7/24	233
369a°	Tokala (Boven)	30	1934—1938	12	238	233	246	395	486	342	332	288	322	227	214	224	4251	16.3	14.3	17.5	18.6	18.4	15.5	16.4	9.6	5.6	6.7	9.3	153.1	68	57	79	63	108	104	123	115	67	50	72	51	177	291	7/26	215
369b°	Lemo	30	1936—1941	6	263	261	294	277	393	288	288	288	288	288	288	288	3833	18.4	19.3	18.9	23.0	20.8	23.8	22.0	14.0	8.2	9.8	13.9	209.4	54	63	68	55	114	152	123	108	74	54	52	49	189	266	6/41	220
369c°	Tawaggo	25	1936—1941	6	276	239	246	315	336	288	288	288	288	288	288	288	3420	18.8	13.6	14.0	14.4	15.8	16.5	8.7	4.8	3.8	8.8	3.0	140.1	35	38	60	41	100	127	78	100	50	34	34	51	148	278	6/41	154
370°	Koro Waido	112	1914—1925	9	319	196	307	331	257	226	230	196	228	180	196	256	2798	19.4	14.4	19.5	19.6	17.0	17.9	17.6	17.6	11.3	11.4	12.8	14.9	190.1	67	45	59	62	69	56	49	58	39	39	44	52	95	110	1-15	102
370a°	Tinompo	115	1925—1933	8	189	230	206	273	238	261	153	109	88	59	193	217	2160	12.9	13.6	15.0	15.6	15.0	13.4	10.1	6.9	4.4	11.1	16.1	168.2	42	35	40	49	42	30	34	29	26	26	41	71	71	180	4/26	87
370b°	Lenlengi	250	1931—1941	11	357	335	431	381	367	257	202	172	186	144	196	280	3209	15.1	20.2	18.4	18.6	17.9	16.5	12.2	7.0	9.2	14.9	16.2	185.3	68	74	68	64	63	53	55	54	50	51	45	65	100	188	2/33	128
370c°	Anglowo	10	1931—1941	10	241	173	306	182	224	222	183	166	132	173	253	229	2825	11.8	10.1	17.4	12.3	17.1	15.6	13.7	8.9	9.0	12.4	15.9	178.2	58	58	72	61	77	64	56	54	50	45	48	71	153	200	4/37	181
370d°	Tompano	350	1931—1941	10	186	210	327	304	336	267	198	172	117	108	117	196	2542	12.9	14.0	17.8	16.3	15.6	13.1	10.3	9.1	5.4	12.5	11.5	153.7	44	45	76	56	74	52	52	45	34	29	40	59	44	98		141
371°	Bowolian	1	1916—1941	25	170	189	221	304	288	296	264	179	172	117	89	77	2332	13.8	10.7	12.9	17.5	17.9	16.9	9.3	6.9	6.5	9.9	7.3	151.3	39	34	54	59	66	79	71	63	35	24	38	44	125			
371a°	Lauwo	80	1931—1941	10	198	206	312	309	440	39	41	1	67	216	208	340	2337	12.5	14.2	19.5	21.0	21.0	16.2	14.6	14.5	9.8	14.4	15.4	197.1	55	63	64	71	84	51	40	36	25	42	65	66	107	182	8/—	—
372°	Sarlemati	850	1916—1941	25	298	260	286	388	346	308	268	166	78	68	146	246	2867	15.8	13.6	19.0	16.2	17.1	10.5	7.1	4.9	4.6	5.6	9.3	133.7	61	63	70	72	91	106	57	44	30	31	34	46	57	78	2.29	63
372a°	Sarlemati	1	1935—1941	7	173	208	177	268	287	269	115	97	53	32	92	180	2291	12.7	13.7	17.9	17.9	17.0	9.9	8.6	6.4	4.8	6.4	13.3	152.3	58	58	57	62	71	69	52	42	16	16	26	36	67	114	5.29	91
372b°	Wawoarbi	35	1933—1941	7	128	187	163	180	227	236	166	107	53	32	68	101	1388	9.7	12.7	14.9	15.6	16.8	11.3	9.2	5.1	3.3	5.1	11.7	129.5	37	33	40	38	37	34	42	30	18	18	26	26	59	252	6-22	229
373°	Kendari	10	1908—1941	33	182	170	196	181	207	124	128	62	39	17	69	171	1688	12.2	10.5	11.9	13.4	12.2	9.0	6.6	2.7	2.2	6.1	11.7	125.2	42	30	49	30	32	32	42	20	12	8	26	39	91	204	7-09	144
373a°	Grote Tukea	3	1918—1941	24	201	198	215	185	239	226	188	98	65	25	72	93	1586	12.5	11.9	12.2	10.5	13.6	6.4	4.8	2.5	2.3	3.2	9.9	107.0	50	44	56	33	53	30	41	18	11	11	19	42	56	190	7-12	165
373b	Rato Rato	280	1920—1930	10	162	128	227	188	288	241	116	57	64	60	95	116	1692	9.4	14.1	12.9	11.8	14.7	9.9	6.1	6.3	5.8	6.1	10.0	117.6	34	30	37	37	45	41	19	24	20	15	17	33	25	84	11-21	75
374°	Lemoko	5	1911—1924	14	214	188	227	160	250	248	168	49	45	30	92	183	1889	12.8	14.8	12.3	16.0	11.4	7.8	3.7	3.6	2.6	5.9	12.6	119.9	49	48	50	44	55	71	49	17	15	13	23	46	105	235	6-22	168
375°	Raba	5	1911—1941	31	172	190	214	166	222	212	118	35	27	20	56	128	1550	11.9	15.3	12.1	17.4	10.8	6.0	3.4	2.1	2.2	5.3	12.6	115.3	41	48	49	49	58	64	42	14	13	10	21	41	93	154	6-23	121
375a°	Tompeana Bale	430	1937—1941	5	133	125	190	154	195	230	66	30	26	4	37	144	1404	11.8	15.4	12.8	16.8	13.0	6.5	2.8	2.6	0.8	4.0	14.0	116.5	33	21	49	37	49	74	20	8	10	3	18	38	34	156	5-37	100
376°	Wangi-Wangi	10	1904—1941	37	200	196	200	313	340	200	110	34	20	30	84	147	1886	15.5	13.1	15.3	16.3	12.5	8.0	3.7	2.1	3.8	6.3	11.1	104.8	30	36	52	52	75	55	38	16	9	24	30	43	105	160	5-41	134
377°	Boeton (Baoe-Baoe)	15	1907—1941	34	287	253	224	208	183	168	98	30	19	34	113	285	1896	16.9	13.5	14.0	14.9	11.8	6.7	3.5	2.2	3.9	9.5	17.3	123.8	62	58	57	57	66	46	30	15	16	16	38	57	106	171	4-29	108
377a°	Taotoomo	150	1935—1941	7	148	116	198	236	260	246	88	40	34	21	108	188	1884	18.0	15.3	17.7	19.4	13.9	7.4	5.1	3.0	2.6	7.0	13.2	130.7	44	47	39	42	48	46	28	21	15	13	28	33	78	42	6-40	75
378°	Kolaka	15	1907—1941	35	204	199	235	231	263	188	133	93	82	120	151	154	2003	17.9	14.0	13.7	14.8	13.1	10.5	7.8	6.9	7.7	9.9	12.0	135.8	57	64	65	58	65	46	38	31	28	38	31	48	110	181	4-22	114
378a°	Mowewe	234	1919—1941	22	165	154	193	237	291	208	143	92	68	88	132	92	1989	13.4	11.3	17.1	18.2	16.1	12.1	8.8	6.0	6.7	9.2	9.2	145.9	39	43	42	47	54	46	35	27	26	29	41	29	73	108	11-34	103
378b°	Mala-Mala	200	1919—1925	5	133	230	231	473	229	234	143	224	88	80	225	166	2389	12.4	13.0	20.2	15.8	13.8	11.2	9.6	6.3	9.5	10.8	9.0	143.2	37	46	47	44	61	54	48	63	35	23	48	39	108	163	8-24	122
378c°	Larona	300	1918—1933	14	316	268	368	420	305	257	192	144	136	101	215	241	2863	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
378d°	Soroako	300	1918—1941	24	245	228	222	338	300	256	223	199	118	102	179	244	2733	15.5	19.0	20.4	22.0	18.7	16.2	13.9	13.5	8.8	12.0	15.2	185.8	57	57	58	68	58	59	52	43	41	37	48	52	91	164	4-21	136
378e°	Kawata	300	1929—1941	14	312	293	396	402	335	219	196	151	104	146	173	263	3093	17.3	13.2	23.2	23.3	21.1	17.8	14.9	12.4	10.1	11.8	14.0	195.7	69	78	74	68	67	47	48	50	32	47	41	31	51	167	2-98	116
378f°	Wotoe	30	1931—1941	11	177	197	283	384	330	233	248	196	94	113	157	287	2898	12.3	11.1	15.8	15.1	11.5	12.7	8.8	6.2	6.5	9.3	13.3	140.1	52	64	72	102	80	63	62	62	44	47	44	49	114	300	4-27	180
378g°	Lasoa	1	1931—1941	10	171	189	279	309	481	368	330	237	134	185	163	370	3080	8.8	11.2	14.6	14.5	16.5	3.9	13.5	9.9	7.8	8.1	10.5	11.0	132.6	57	52	77	101	110	99	87	64	62	80	43	71	179	300	8-29	232
379°	Makii	3	1908—1941	31	276	276	344	374	325	250	186	157	157	145	208	262	2960	12.3	13.3	16.5	18.8	17.8	15.2	14.1	11.4	9.4	10.2	12.3	14.9	173.4	61	66	70	71	70	67	53	48	47	38	40	57	58	185	12-27	134
379a°	Bajoeda	20	1917—1941	24	238	224	316	350	327	305	244	179	105	113	141	250	2992	14.6	17.5	18.1	17.2	16.7	12.7	10.5	6.8	7.1	9.2	14.1	151.1	55	55	70	72	67	65	75	58	41	40	45	57	105	160	7-29	158
379b°	Towiboroe	350	1917—1941	24	417	383	483	488	522	416	329	283	242	226	275	386	4456	17.3	21.2	22.0	22.8	20.0	18.3	15.6	14.2	12.3	15.5	19.4	214.6	68	66	77	74	81	72	68	54	54	58	58	58	113	180	7-23	141
379c°	Matarape	30	1918—1941	24	299	271	354	423	377	297	220	168	116	118	174	224	3080	14.2	17.6	17.9	17.0	14.4	11.5	9.5	6.5	7.0	9.0	13.5	153.7	68	63	71	87	74	69	80	59	42	42	41	64	114	228	8-38	172
379d°	Timampoe'oe	250	1919—1941	23	231	211	323	391	324	291	228	189	144	136	240	231	3068	13.1	16.4	18.0	17.4	15.8	14.3	11.9	9.2	7.9	12.1	13.6	162.8	51	50	63	81	63	66	47	50	43	47	69	59	113	218	6-21	153
379e	Kepoeroe (Soe-Soe)	275	1920—1933	13	284	293	368	398	293	224	163	119	121	78	198	284	2992	17.6	19.1	18.7	16.8	14.3	13.4	10.7	9.5	8.4	11.4	14.7	173.6	60	57	69	70	51	57	47	34	33	38	25	54	65	109	1-22	102
379f°	Moengkoetoena	45	1931—1941	10	334	227	498	462	510	337	299	249	180	223	341	319	3980	20.8	25.1	23.3	23.5	20.8	18.5	17.8	11.3	13.6	15.4	18.1	240.4	74	51	70	70	58	62	56	56	34	42	36	62	116	206	5-27	150
379g°	Pae-Pae	250	1933—1941	9	344	251	359	346	304	272	192	133	152	138	188	280	3154	15.2	19.3	21.0	19.9	19.0	13.4	12.0	9.8	10.3	13.1	16.5	175.6	58	51	70	61	51	54	50	36	43	34	34	51	92	138	3-26	106
380°	Pamalo	300	1912—1941	29	374	361	522	625	450	292	195	134	129	194	319	434	4560	16.3	21.8	23.6	22.6	18.1	15.8	12.4	10.9	13.0	17.4	19.6	216.0	83	82	86	92	85	67	55	37	41	48	63	79	131	231	5-27	171
381°	Tomata	375	1916—1941	26	340	343	439	421	217	135	110	72	63	92	97	229	2558	17.3	21.1	19.6	15.0	13.0	11.7	8.8	6.5	5.5	10.4	16.4	167.4	66	57	61	67	44	30	26	20	24	23	44	58	92	233	4-21	168
382°	Tariga	425	1915—1941	27	377	251	390	435	236	130	108	61	65	150	259	339	3101	17.7	17.3	17.7	13.5	10.0	8.6	6.3	5.7	7.5	13.3	14.6	140.0	39	36	46	38	30	28	21	23	23	36	37	42	97	161	4-23	139
383°	Tentena	516	1914—1941	28	165	181	108	270	382	172	122	67	74	167	222	126	1806	6.6	9.4	13.4	12.6	8.8	6.7	4.8	4.4	7.4	10.4	8.8	100.4	33	32	32	38	28	32	40	25	27	28	34	35	29	245	3-19	186
384°	Kasiwa	337	1913—1939	25	73	104	165	300	284	230	138	106	106	118	132	160	1906	10.0	12.8	17.4	17.6	15.4	13	9.2	8.8	8.4	11.0	14.0	142.0	22	22	48	36	42	33	40	27	28	34	35	29	38	182	4-14	117

No.	STATIONSNAAM	Hoogte boven zee in meters	Tijdvak	Aantal waarnemingsjaren	Gemiddelde regenval in mm.													Gemiddelde grootste hoeveelheid per etmaal in mm.											Absol. max.	Gem. van de jaarl. max.	Gem. van de grootste max.
					Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jaar	Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Okt	Nov	Dec	Jaar			
	CELEBES																															
385*	Poso		1875—1931	45	193	194	249	273	279	232	267	192	196	140	169	161	2397	122	112	129	141	136	144	136	100	83	92	112	104	132	56	55	69	63	72	58	59	51	46	59	57	51	111	169		138
385a	Tokelemboeng		1929—1940	23	330	332	401	389	335	269	257	193	67	75	97	162	3331	33	67	96	92	105	104	94	73	53	48	75	76	96	23	45	47	53	38	31	53	35	32	35	39	54	59	163		163
385b*	Bewara	± 5	1933—1941	9	171	172	161	136	216	191	227	138	64	83	67	84	1723	56	86	55	50	64	85	67	64	29	39	34	44	62	72	33	37	35	42	30	22	48	29	45	39	48	113	160		148
386*	Wanetaue	± 1100	1916—1931	21	168	157	260	273	196	169	91	80	78	110	180	177	2128	45	53	71	80	73	68	56	102	91	107	104	134	171	30	33	41	47	38	33	26	25	24	34	31	38	63	209		95
386a*	Bombe	650	1917—1941	23	193	205	286	329	262	196	117	75	79	131	200	181	2158	57	57	68	80	93	72	69	64	65	91	114	119	143	39	41	47	55	46	35	29	28	29	26	41	42	72	104		99
386b*	Kantewoe	—	1918—1931	11	167	172	253	286	227	230	157	146	145	179	236	174	2195	45	53	57	69	58	59	54	52	48	52	57	56	100	40	37	48	52	48	48	37	34	39	38	48	39	71	120		92
386c*	Lawoe	± 1000	1931—1941	11	166	160	237	319	277	228	168	135	139	181	226	117	2171	57	57	72	84	73	63	56	64	52	57	63	65	84	42	43	56	62	58	47	39	39	38	38	46	45	58	142		124
387*	Kolonsi	729	1916—1931	26	168	157	268	289	265	245	175	181	196	166	226	178	2219	57	57	72	84	73	63	56	64	52	57	63	65	84	38	43	56	62	58	47	39	39	38	38	46	45	58	111		96
387a	Pamahajan	—	1917—1941	25	229	229	261	278	263	188	241	191	235	196	231	268	2780	76	67	82	84	78	66	64	58	58	67	70	114	115	76	67	82	84	78	66	64	58	58	67	70	114	115	126		107
387b	Kawoe	± 2	1918—1928	6	234	218	193	273	239	240	196	91	149	237	237	222	2633	65	56	55	68	72	57	54	29	45	62	76	70	120	65	56	55	68	72	57	54	29	45	62	76	70	120	149		129
387c	Siompu	± 2	1916—1931	16	225	222	252	264	245	246	177	177	196	192	253	264	2717	62	56	61	79	56	59	58	58	64	69	64	76	91	62	56	61	79	56	59	58	58	64	69	64	76	91	225		141
387d	Wawo	± 1000	1931—1941	11	178	225	244	251	232	198	180	85	77	134	231	198	2236	48	54	48	70	66	60	70	66	60	55	94	140	149	34	41	51	49	45	42	29	24	28	41	44	53	72	84		118
387e	Ratoe	1290	1931—1941	11	229	238	273	295	268	177	136	101	77	103	228	236	2496	61	53	63	62	60	53	35	24	28	23	36	34	48	62	53	63	62	60	53	35	24	28	23	36	34	48	62	111		114
388*	Gelenmpeng	± 96	1917—1931	23	161	179	196	210	177	187	77	44	80	77	195	180	1855	37	37	42	43	43	33	30	23	29	30	29	29	34	37	37	42	43	43	33	30	23	29	30	29	34	37	152		94
388a	Limboeng	± 400	1918—1941	22	215	249	249	272	247	259	155	147	90	151	229	253	2999	62	58	68	64	66	51	49	31	31	27	33	35	39	42	48	44	53	51	49	31	31	27	33	35	39	78	104		79
389*	Mamoedjoe	—	1916—1941	25	186	185	239	248	235	255	236	159	166	193	252	237	2586	62	52	54	70	62	58	52	56	57	56	56	73	57	62	52	54	70	62	58	52	56	57	56	73	57	119	139		141
389a	Mekenda	240	1931—1941	10	227	229	241	234	237	232	176	169	96	210	237	214	2397	82	87	88	94	82	62	60	56	59	53	80	103	106	109	82	87	88	94	82	62	60	56	59	53	80	103	106	109	203		207
389b	Blameta	1130	1916—1941	25	152	172	214	279	267	210	144	110	114	144	201	175	2176	42	110	160	180	176	148	108	93	83	101	153	144	123	29	37	38	43	45	42	37	33	31	32	30	36	65	95		88
390*	Pasah	1052	1920—1931	11	174	252	235	408	368	258	146	91	85	132	225	218	2605	70	73	82	84	82	73	62	56	53	52	62	73	82	43	50	56	68	64	58	51	42	47	58	51	50	125		113
390a	Tamalatei	1005	1924—1940	17	261	257	359	444	443	326	279	189	261	282	393	319	3609	83	59	80	83	84	66	64	49	46	50	61	72	97	48	49	52	64	66	51	48	50	58	46	69	53	97	198		129
390b	Maroso	—	1923—1938	9	134	132	247	405	197	138	130	71	109	137	218	213	2135	45	31	43	49	46	32	20	17	19	18	19	29	29	33	27	33	33	37	21	29	28	19	26	34	27	63	79		70
391*	Arale	670	1917—1923	6	165	187	269	378	296	231	179	226	228	249	329	226	2693	68	78	78	84	78	52	40	30	29	30	32	40	43	34	34	43	60	53	44	32	32	20	51	76	54	49	90		82
391a	Sambe (Tanrara)	200	1919—1941	23	259	263	329	373	322	245	215	211	224	264	317	298	3497	82	82	87	103	107	79	69	53	47	48	58	77	125	76	52	64	64	57	52	46	32	33	32	37	22	57	79	103		88
391b	Mambe	610	1923—1941	18	227	213	295	344	319	295	210	233	197	213	288	283	3117	85	74	84	92	78	64	54	44	44	44	52	62	67	58	51	60	58	58	44	44	32	25	26	40	30	51	90		115		96
392	Malili	370	1917—1941	23	325	262	321	379	337	274	195	80	146	180	270	316	3361	83	59	80	83	84	66	64	49	46	50	61	72	97	48	49	52	64	66	51	48	50	58	46	69	53	97	198		129
393	[illegible]	700	1907—1941	33	427	400	315	423	338	295	177	119	118	241	312	444	3917	85	69	71	89	73	69	52	47	49	46	57	72	119	71	75	84	83	67	62	44	31	28	35	43	37	119	216		118
393a	[illegible]	35	1922—1931	20	175	210	228	280	328	244	164	104	115	151	276	262	2477	83	130	201	214	224	172	113	111	85	89	134	173	193	41	60	58	76	65	62	41	41	43	42	58	64	115	295		118
394*	[illegible]	700	1907—1931	11	238	238	276	333	280	256	189	159	155	262	259	253	2778	67	167	182	220	171	181	161	119	99	102	143	168	197	51	55	67	61	69	65	53	39	42	50	56	65	116	227		111
394a	[illegible]	650	1933—1941	9	305	373	393	352	356	347	187	107	96	163	347	424	3400	82	120	224	226	183	124	107	77	93	114	142	170	205	62	72	72	64	70	62	30	24	27	38	41	31	203	335		142
395*	Malole	775	1913—1941	28	326	318	330	360	257	197	106	87	93	181	346	276	3337	80	140	180	199	148	120	91	65	89	74	121	152	160	48	47	57	67	56	45	33	26	24	33	47	41	89	179		106
396	Rawa Kanora	± 1400	1928—1940	13	333	409	395	434	467	318	232	190	225	153	341	431	4337	114	110	246	240	218	112	162	126	94	98	161	216	204	68	69	70	91	76	65	34	40	39	53	64	66	112	140		95
396a	Pasalinga	1400	1928—1941	13	330	354	430	513	368	244	183	110	93	131	315	436	3665	87	165	228	223	192	142	108	89	65	93	163	206	183	57	67	73	87	63	54	33	31	30	39	54	69	105	137		118
396b	Banangpoe	± 1300	1928—1941	14	296	315	404	380	372	298	174	112	84	134	320	410	3608	84	182	242	243	219	184	141	108	83	98	166	215	193	35	74	66	75	59	56	47	41	23	43	55	59	88	149		115
396c	Mariase	390	1915—1941	24	218	172	143	167	166	102	61	33	32	118	183	209	1727	46	109	102	120	110	89	56	44	53	72	111	126	116	46	32	30	50	37	34	33	22	27	31	43	34	55	123		78
397	Timambong	4	1916—1941	25	178	124	126	168	153	128	64	39	71	112	129	164	1476	44	97	183	125	110	88	53	39	54	78	110	129	109	34	41	41	33	30	49	26	28	22	43	36	44	106	162		77
398	Tjampalagjang	5	1916—1941	25	138	101	132	136	168	118	69	50	60	125	103	138	1323	49	70	70	80	87	57	31	22	31	64	71	75	71	35	38	31	45	47	36	33	28	33	49	37	44	112	175		225
399	Polonali	5	1931—1941	25	255	238	208	246	230	198	114	79	89	191	295	432	2018	91	82	80	92	83	57	39	29	37	53	74	83	93	49	39	43	59	53	43	37	24	24	37	47	34	120	200		148
399a	Kalora	680	1909—1926	10	314	187	177	168	149	143	102	100	103	149	164	168	1709	80	122	120	123	98	87	66	73	79	100	98	119	119	32	42	43	43	41	23	23	43	35	59	44	44	42	81		115
399b*	Bedjo	10	1918—1941	23	133	136	213	234	206	174	132	100	67	68	141	134	1838	36	106	147	155	125	108	103	74	49	57	96	99	122	40	40	52	53	48	36	30	26	29	29	44	42	44	90		158		108
400*	Pawlang	30	1907—1941	34	214	226	259	286	246	186	111	67	68	123	179	226	2191	91	151	161	177	163	139	97	69	63	96	134	173	158	53	63	59	64	63	38	29	22	28	44	36	56	116	158		104
400a*	Bwenji	± 4	1918—1926	7	222	236	245	340	265	200	142	61	102	209	245	218	2541	84	137	124	129	124	80	60	31	46	91	101	107	110	74	67	59	61	60	52	41	30	38	33	61	75	106	131		119
400b*	Jeva	1	1918—1941	23	121	135	201	294	459	369	305	197	166	172	152	99	2670	71	110	150	171	197	164	145	110	93	100	98	90	132	42	46	49	50	89	82	79	65	55	57	50	37	119	176		122
400c*	Bilolo	± 23	1929—1941	13	172	131	133	202	245	195	93	47	29	31	116	115	1319	51	84	93	116	120	112	67	47	33	50	68	83	96	36	33	31	34	67	63	33	18	13	20	40	35	99	192		123
400d	Bone	± 40	1930—1937	7	161	204	241	294	343	228	191	166	146	229	174	191	2648	118	127	154	187	189	153	114	103	66	91	109	121	154	45	57	64	92	74	50	31	30	36	43	59	68	68	133		175
400e	Lampi	± 15	1930—1941	12	161	131	215	279	231	174	93	68	71	138	152	177	1917	57	58	109	126	128	89	60	49	29	49	65	73	93	43	49	45	71	49	45	29	23	29	43	51	56	122	231		136
400f	Sentrng	—	1937—1941	5	222	179	314	299	382	173	89	73	51	71	178	232	2196	82	106	166	172	190	108	90	62	52	56	120	132	140	54	66	78	68	51	61	36	35	28	16	35	36	113	127		123
401*	Parang	± 12	1916—1941	21	215	169	195	258	297	162	130	69	81	157	182	187	2070	83	103	103	124	120	93	78	55	52	81	101	106	113	60	52	57	63	73	58	47	29	40	48	55	57	122	302		200
401a	Mahawang	± 39	1930—1941	12	200	201	247	281	301	225	128	155	119	191	216	141	2461	88	87	109	128	143	103	66	65	44	69	92	89	110	57	63	84	69	82	62	58	41	71	59	69	61	158	427		254
401b	Maroangka	71	1930—1941	11	187	176	264	344	448	334	224	203	123	134	335	161	2397	85	95	109	138	169	136	97	93	65	83	88	100	128	32	35	86	77	93	88	55	39	33	46	69	48	134	188		133
401c	Kalango	± 63	1930—1941	12	207	179	260	255	264	95	58	54	21	70	160	203	1765	53	56	113	153	109	63	50	36	22	39	73	70	92	64	66	83	67	72	39	23	18	33	23	45	55	106	231		133
401d	Langsa	± 15	1930—1941	12	305	223	256	277	251	125	76	39	59	119	193	276	2178	115	87	94	113	88	58	53	39	22	48	84	126	89	85	66	75	74	81	48	32	21	40	36	51	67	133	348		147
401e*	Kappang Ar.	28	1909—1941	33	168	168	193	254	322	212	161	113	83	153	169	153	2158	59	99	108	152	142	122	98	67	50	75	95	97	119	47	30	53	66	62	57	49	38	34	51	54	51	114	200		117
401f	Mario	38	1924—1940	15	137	127	177	222	319	195	147	103	71	116	163	118	1943	83	105	120	160	171	149	110	93	57	84	105	98	135	68	40	62	70	66	52	45	33	28	43	50	47	94	138		117
401g*	Bangkai	19	1928—1941	14	229	157	181	213	258	165	103	65	39	86	156	122	1785	82	100	106	131	126	123	73	54	36	61	93	101	113	77	47	58	58	65	49	36	26	30	48	58	38	112	200		134
402a*	Bile	25	1930—1940	12	209	163	229	336	433	335	237	182	83	233	257	64	2662	110	97	134	187	190	183	140	119	65	108	113	76	143	39	40	57	54	93	63	71	39	30	48	41	25	123	231		133
402b	Alabameng	± 20	1909—1922	13	155	155	156	193	220	127	81	65	43	135	148	111	1663	88	83	90	98	110	101	58	36	27	59	75	90	92	43	40	42	38	39	40	21	20	18	30	35	40	84	135		116
402c*	Tarroetedeng	16	1930—1941	11	160	113	163	231	320	231	177	121	67	67	141	92	1954	111	82	115	145	147	107	98	50	34	84	103	76	126	34	44	34	39	80	83	47	30	27	31	30	37	109	178		126
402d	Belawahgeng	40	1925—1941	17	105	77	153	243	396	337	256	83	65	85	125	93	1868	147	57	95	144	161	118	95	64	47	58	84	67	105	45	33	53	68	92	91	50	31	28	29	43	37	128	183		146

CELEBES

No.	Stationsnaam	Hoogte boven zee in meters	Tijdvak	Aantal waarnemingsjaren	Gemiddelde regenval in m.m. Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jaar
413e*	Pangkadjene (irr.)	12	1929—1941	13	136	95	134	207	241	172	102	60	32	66	105	97	1491
404*	Pare-Pare	2	1908—1941	31	340	250	230	220	175	88	65	40	48	101	221	363	2133
404a*	Baroe?	± 35	1910—1929	9	108	110	147	178	191	146	106	50	33	71	115	156	1406
404b*	Pana	± 80	1918—1941	23	84	105	142	290	416	287	123	106	75	97	149	112	1992
404c*	Amparita?	15	1921—1941	20	171	114	145	198	239	192	88	94	28	30	111	140	1534
405d	Palanro?	± 2	1912—1941	10	372	335	346	277	208	146	85	56	31	133	140	467	2936
405e	Mangkoso	3	1912—1941	30	622	399	306	219	165	128	70	33	29	97	232	417	2840
405*	Barroe?	12	1906—1941	35	97	109	122	196	226	230	135	86	46	97	143	112	1642
405a*	Lalisa?	9	1922—1941	26	136	92	111	199	290	211	112	68	73	78	112	108	1560
405b*	Kal. (Salopoko)	7	1926—1941	15	136	96	140	272	256	198	321	72	28	71	126	102	1521
405c*	Batoe-Batoe?	20	1928—1941	13	151	125	163	217	325	209	105	64	26	62	121	101	1672
405d*	Watang Poeloe?	± 20	1928—1941	13	101	111	169	312	441	240	314	131	46	111	187	111	2311
406*	Pampanoea	35	1906—1941	35	110	140	193	246	239	229	142	68	48	85	129	130	1771
406a*	Palima	—	1918—1941	23	104	134	178	229	377	294	206	87	63	112	125	161	2015
407*	Watansoppeng	± 120	1906—1941	36	189	161	170	237	270	219	125	59	59	96	145	162	1939
408*	Soempangbinangae	± 2	1908—1941	31	424	350	312	195	161	81	47	22	26	45	232	451	2427
409*	Segeri	1	1881—1941	60	685	498	413	250	173	115	69	28	31	161	315	630	3350
409a*	Takalala	[illegible]	1928—1941	13	174	133	130	181	245	154	109	35	21	37	111	110	1436
410*	G. Toeng Lamoeroe?	± 400	1914—1941	27	156	143	163	211	268	259	163	82	44	66	130	156	1839
410a*	Laroeng?	85	1923—1941	13	151	173	244	416	479	400	331	104	59	61	145	237	2712
410b*	Taijpi?	168	1928—1941	13	137	164	239	326	308	294	176	82	40	47	124	173	2192
410c*	Malimpe?	± 13	1937—1941	5	137	133	192	340	535	347	186	126	61	33	134	191	2415
410d*	Kampong Toro	1972	1936—1941	5	143	129	204	332	309	391	198	171	38	42	137	155	2416
411*	Walampoea?	20	1906—1941	36	136	137	217	307	340	363	249	105	63	105	146	153	2329
411a*	Kampong Paleko	42	1936—1941	6	176	182	231	475	398	304	226	149	88	43	193	209	2674
411b*		± 40	1917—1941	5	131	76	241	389	476	383	350	157	86	51	164	47	2720
411c*	[illegible]	± 300	1912—1941	27	147	128	160	383	572	404	377	169	65	89	341	122	2990
412a*	[illegible]	107	1928—1941	12	146	44	164	244	346	396	179	84	35	62	160	141	2026
412b	Gowa?	± 24	1928—1941	21	479	439	408	258	151	69	37	24	48	71	267	538	2234
413*	Pangkadjene	3	1879—1941	63	782	431	418	252	158	111	57	20	34	151	295	565	3343
414	Tekolabboea	8	1916—1925	9	643	563	416	185	47	75	67	20	31	126	281	724	3299
415*	Maros	± 5	1911—1941	30	761	536	411	237	148	86	50	17	22	80	238	593	3175
415a*	Donlang?	± 25	1916—1941	21	755	472	417	279	191	127	71	19	20	105	289	584	3354
415b	Bonto Kappong	8	1931—1941	11	840	543	495	296	206	101	44	17	16	88	320	401	2576
416*	Tjamba	300	1881—1941	60	444	329	297	220	182	156	96	43	32	66	169	331	2383
416a	Kappang	270	1919—1925	3	867	613	726	284	145	123	50	50	36	142	327	681	4044
417	Palaoe?	± 200	1914—1941	27	348	349	351	218	380	305	219	106	59	76	96	377	2093
417a*	Bodjo?	20	1928—1941	13	107	75	116	304	656	443	221	85	59	45	73	92	2280
418*	Sindjai	—	1879—1941	62	125	125	147	290	497	432	251	10	56	87	87	113	2378
419*	Manipi	± 750	1916—1941	22	217	197	183	264	456	406	248	118	62	74	142	235	2602
419a*	Tombolo	± 1000	1920—1941	22	441	311	220	227	315	262	165	72	39	37	147	351	2489
419b*	Malino	1021	1910—1941	10	912	714	545	452	284	187	95	39	23	51	264	644	4210
420*	Bikeroe	230	1881—1941	60	291	275	314	345	489	463	311	113	55	30	148	281	3177
420a	Balombessi?	150	1918—1941	24	201	293	347	351	479	409	226	89	47	35	136	271	2998
420b	Balangnipa?	—	1925—1941	17	272	250	358	343	539	454	214	98	41	70	105	239	3303
421*	Kadjang	8	1881—1941	60	156	152	192	300	472	410	218	70	35	64	89	147	2305
422*	Makasser	2	1879—1941	63	719	533	425	206	92	68	34	10	13	40	174	590	2902
422a	Makasser (irr.)	± 3	1928—1941	14	702	436	399	202	84	49	30	9	6	23	124	489	2377
422b	Makasser (DWL)	[illegible]	1930—1941	11	792	501	377	208	107	36	24	23	13	22	151	535	2808
423	Soenggoeminasa	± 5	1911—1941	280	720	464	361	189	93	63	23	11	14	36	185	523	2680
424	Boelekang?	± 20	1914—1923	9	577	460	331	169	128	68	36	21	37	121	217	470	2626
424a*	Bissoloro?	430	1917—1923	5	872	644	500	294	205	119	56	14	39	148	375	701	3971
424b	Tanete?	± 2000	1919—1941	15	931	583	455	353	207	164	78	32	39	34	247	535	3102
424c	Borbik?	± 56	1923—1941	18	845	511	439	233	218	116	46	30	16	66	248	514	3274
424d	Borongrappoa?	840	1925—1941	17	367	353	410	436	639	592	341	172	58	52	136	250	3766
425	Limboeng	± 10	1913—1941	28	712	422	327	125	79	49	19	13	17	50	176	506	2495
426	Tai?	—	1911—1941	30	575	356	384	107	70	31	18	5	10	34	140	397	2127
427*	Aoes?	3	1881—1941	39	465	335	239	114	88	66	29	9	10	39	146	366	1906

No.	Gemiddeld aantal regendagen Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jaar
413e*	7.8	7.5	9.9	10.2	11.3	10.4	5.1	3.4	2.7	3.8	6.4	6.5	84.2
404*	12.9	12.0	12.5	11.2	9.4	7.7	5.6	3.7	3.8	6.6	11.0	15.1	112.0
404a*	12.0	11.9	13.2	16.1	15.6	14.1	11.0	6.2	3.1	7.4	10.0	14.0	137.4
404b*	5.7	6.5	9.0	12.6	16.2	11.3	9.0	6.3	3.0	6.0	7.4	7.2	104.2
404c*	9.5	8.9	10.6	13.2	14.1	11.1	6.6	4.4	2.6	4.0	7.3	9.1	101.4
405d	4.9	9.3	10.3	7.0	6.9	4.5	3.6	1.8	1.7	5.4	9.4	11.9	85.0
405e	6.7	12.4	11.7	10.2	8.5	6.4	4.0	2.6	2.9	6.6	12.0	14.9	111.2
405*	8.6	8.3	9.7	14.4	17.4	15.2	11.6	7.9	5.0	6.6	9.4	9.2	122.6
405a*	7.6	6.8	8.6	12.3	14.0	12.9	8.6	5.1	4.0	4.9	8.1	7.9	100.8
405b*	9.1	7.7	10.4	11.9	14.6	12.0	7.6	5.1	2.9	4.4	8.4	7.3	101.7
405c*	7.7	6.5	7.3	10.3	11.0	9.3	5.1	3.4	1.6	3.4	5.9	6.4	78.4
405d*	7.4	7.4	10.3	16.5	20.2	15.7	11.4	9.0	4.2	7.2	10.6	7.7	128.6
406*	9.1	9.5	10.7	16.1	17.5	14.9	11.9	8.4	5.0	7.2	9.7	10.4	130.7
406a*	7.7	7.5	10.3	15.1	16.4	13.3	10.5	6.0	4.2	5.7	7.7	7.7	112.1
407*	12.0	11.2	13.0	14.6	15.3	13.7	8.5	5.1	4.0	6.3	9.0	10.9	121.4
408*	12.5	14.1	14.0	11.2	8.6	6.1	3.7	1.6	2.5	6.1	11.4	18.0	114.8
409*	20.2	19.9	15.4	11.8	9.7	7.3	4.6	2.1	2.3	6.5	13.7	19.8	129.2
409a*	11.5	9.7	8.1	11.4	14.1	11.6	7.4	3.8	2.0	3.5	7.8	7.9	97.8
410*	13.6	12.5	12.3	16.9	17.6	16.0	12.5	6.9	4.4	5.4	9.6	13.3	141.0
410a*	9.6	9.8	12.2	16.0	17.5	16.3	11.0	8.4	3.3	4.3	9.0	10.8	128.6
410b*	11.8	9.5	13.1	14.6	12.2	8.1	6.1	2.2	3.2	7.5	8.5	8.3	100.3
410c*	12.2	11.0	16.6	20.0	20.4	19.4	16.2	11.0	6.5	4.8	9.6	13.6	163.3
410d*	10.0	9.8	12.7	17.0	19.3	16.8	13.2	8.2	3.5	2.7	6.7	9.2	129.4
411*	11.6	11.5	12.8	17.4	17.9	17.3	13.4	9.6	3.4	4.9	9.9	11.8	145.5
411a*	12.8	12.5	15.7	18.0	22.2	17.4	13.8	10.2	5.2	3.7	10.3	11.8	154.9
411b*	12.6	14.4	17.2	17.4	23.6	19.2	15.6	10.2	6.4	3.8	10.4	13.6	164.4
411c*	10.9	9.9	11.0	15.7	18.4	16.5	12.6	6.1	4.0	4.9	7.2	8.7	125.6
412a*	7.2	7.9	7.8	10.1	12.7	10.4	7.6	5.5	2.5	2.4	5.1	8.2	87.1
412b	20.2	13.7	14.6	13.7	9.4	6.1	3.4	1.6	0.8	4.3	11.2	17.8	100.2
413*	22.5	18.4	16.4	12.3	8.8	6.9	4.1	2.0	2.1	5.8	13.4	20.9	133.6
414	24.9	21.3	20.4	11.4	9.5	8.6	7.0	1.9	2.4	9.1	13.9	22.3	152.7
415*	22.4	17.5	17.0	11.8	9.9	7.1	3.7	1.3	1.4	5.4	12.0	20.0	129.5
415a*	22.0	17.0	17.9	13.1	12.0	9.0	4.9	2.0	1.7	6.0	14.7	21.2	145.2
415b	22.5	19.3	19.4	15.3	13.5	10.5	4.0	2.0	2.1	5.5	15.0	21.3	153.5
416*	21.3	18.2	13.7	15.4	13.6	8.1	5.0	3.0	5.4	11.5	20.0	17.7	156.5
416a	25.2	23.6	20.2	12.0	8.0	8.0	3.8	1.8	1.4	3.6	17.3	23.0	150.9
417	17.4	30.2	30.9	13.3	14.5	13.2	12.5	7.6	4.1	4.0	7.7	12.0	126.4
417a*	12.2	6.2	7.7	13.0	19.3	15.5	10.6	5.2	3.0	3.1	4.8	6.2	102.8
418*	11.2	10.3	11.7	14.7	19.5	17.3	13.7	7.9	4.0	3.0	6.0	10.1	126.0
419*	11.3	14.5	15.5	17.2	20.3	18.1	14.6	9.2	4.5	3.3	10.6	18.0	213.0
419a*	20.9	16.2	16.1	15.2	16.0	15.2	10.1	3.6	2.7	3.6	10.0	18.0	149.6
419b*	21.2	22.9	23.9	22.6	18.8	15.0	7.3	3.7	2.0	4.8	14.1	24.9	187.7
420*	20.9	15.6	17.2	16.4	19.7	17.4	15.6	7.8	3.5	4.7	8.6	15.7	157.5
420a	21.3	19.4	21.1	19.7	21.4	18.5	15.2	8.4	4.8	4.8	9.9	17.8	182.4
420b	23.5	20.5	22.0	21.5	22.3	20.4	14.9	8.9	4.9	4.8	9.9	18.7	189.3
421*	21.5	21.3	11.9	13.7	16.5	14.3	10.3	4.4	2.4	3.5	5.8	10.5	115.9
422*	21.7	19.9	18.2	10.8	8.2	6.3	3.7	1.7	1.7	4.5	11.6	21.7	133.0
422a	20.6	17.3	17.1	10.9	6.6	4.6	2.3	1.3	0.7	3.4	9.7	19.8	118.0
422b	21.2	14.7	14.1	9.1	8.0	4.4	2.1	1.5	1.1	2.8	9.8	17.8	108.6
423	20.6	15.8	15.6	8.9	6.9	3.2	2.6	1.0	1.2	3.7	10.0	16.8	108.3
424	19.5	17.3	14.8	10.0	8.8	4.6	3.4	3.4	4.0	7.7	13.0	16.1	122.4
424a*	21.8	20.5	20.0	17.4	13.8	10.2	3.8	1.2	2.8	10.7	17.2	22.8	166.2
424b	21.2	21.4	23.1	20.6	14.8	12.1	8.0	3.1	3.9	5.9	15.3	24.1	101.0
424c	25.1	19.8	20.0	17.6	14.0	9.4	4.8	2.2	2.2	6.2	14.9	23.1	160.0
424d	22.3	20.3	22.8	20.4	22.2	20.2	17.8	9.9	4.1	3.8	9.8	20.1	194.1
425	19.2	13.1	10.5	6.7	5.1	3.8	1.4	0.8	1.3	3.1	8.9	15.5	98.8
426	19.0	13.4	12.2	6.3	4.7	2.7	1.7	0.6	0.9	3.0	8.0	14.7	87.2
427*	22.6	14.1	11.8	7.5	3.8	4.8	2.4	0.7	0.8	2.4	7.8	14.3	91.0

No.	Gemiddelde grootste hoeveelheid per etmaal in m.m. Jan	Feb	Mrt	Apr	Mei	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jaar	Absol. max.	Maand en jaar v/h Absol. Max.	Op één na grootste max.
413e*	58	38	51	58	69	36	38	24	16	27	34	32	101	156	1-'38	146
404*	86	67	70	62	60	34	31	30	23	39	68	85	133	233	11-'30	216
404a*	35	31	45	59	49	46	35	19	12	18	38	40	96	171	4-'20	111
404b*	30	47	49	74	90	72	49	36	34	33	56	40	121	205	5-'34	151
404c*	63	39	43	35	57	47	30	27	15	20	40	30	121	207	6-'22	201
405d	111	86	92	78	69	39	45	44	21	63	89	130	164	256	8-'34	219
405e	119	89	96	46	56	61	28	17	18	38	80	105	143	202	3-'35	181
405*	34	40	43	51	65	37	44	30	15	26	31	39	99	169	7-'21	162
405a*	52	37	40	52	81	63	30	30	27	35	40	38	116	193	1-'38	141
405b*	44	38	44	60	61	49	36	17	11	32	38	30	98	153	4-'29	115
405c*	45	42	61	62	85	64	38	26	16	22	51	37	117	175	3-'32	136
405d*	39	40	55	87	91	75	55	30	32	40	53	34	119	189	4-'33	157
406*	37	31	46	67	71	37	42	31	21	31	41	39	105	184	3-'36	178
406a*	34	43	47	56	77	69	54	34	29	41	44	38	99	132	7-'32	145
407*	42	44	49	38	60	53	37	23	20	36	48	40	94	200	3-'33	137
408*	97	93	79	55	59	36	25	14	13	27	70	100	144	265	2-'35	219
409*	133	106	102	67	60	41	29	16	18	38	74	113	179	470	1-'34	387
409a*	33	37	48	44	46	32	39	18	14	19	32	34	91	146	7-'31	125
410*	39	48	46	34	64	67	49	26	19	29	41	40	101	187	6-'21	164
410a*	45	48	59	102	117	101	65	33	26	30	49	71	142	195	6-'35	193
410b*	50	42	63	70	83	76	49	29	24	16	39	51	113	161	6-'40	150
410c*	39	42	43	47	89	79	46	33	39	22	38	43	142	180	6-'38	121
410d*	36	50	53	82	97	115	37	39	30	26	40	45	123	187	6-'39	122
411*	38	46	49	68	75	93	53	34	27	35	45	47	113	224	6-'14	212
411a*	46	46	64	81	106	96	66	45	20	21	63	47	120	125	5-'38	116
411b*	49	51	55	62	114	84	60	46	21	27	40	40	128	168	5-'38	[illegible]
411c*	40	36	49	84	113	102	75	37	27	30	46	41	153	216	5-'16	[illegible]
412a*	68	41	44	78	105	101	67	27	19	24	36	67	148	300	4-'36	260
412b	115	111	99	43	49	24	15	15	4	31	69	93	158	265	1-'36	229
413*	142	119	115	82	56	42	25	12	14	37	74	123	185	399	12-'60	381
414	103	103	86	60	33	25	25	9	25	36	82	111	140	230	11-'20	176
415*	125	117	101	70	43	29	21	10	16	28	64	109	175	336	1-'39	266
415a*	120	98	85	61	46	39	32	10	11	40	65	106	165	275	1-'29	241
415b	132	121	101	72	49	33	20	10	10	31	59	100	185	276	1-'38	267
416*	78	67	65	50	42	41	32	18	17	26	44	66	85	280	1-'02	260
416a	134	99	147	56	37	42	15	22	22	38	79	111	183	228	1-'23	224
417	39	42	43	32	80	87	77	32	24	26	31	48	129	290	6-'22	272
417a*	38	34	39	60	100	98	70	35	34	17	34	36	114	165	3-'31	153
418*	37	36	41	68	104	98	80	48	27	36	33	36	137	304	6-'41	148
419*	45	41	40	30	82	95	72	30	29	27	34	44	126	408	6-'21	171
419a*	75	62	48	43	62	56	53	25	25	15	36	43	115	195	3-'30	160
419b*	130	99	100	64	50	39	30	19	14	21	15	89	170	252	3-'35	225
420*	66	55	54	78	84	102	74	41	25	25	46	60	137	280	6-'39	253
420a	56	53	60	94	86	99	65	34	25	26	41	60	126	195	6-'39	191
420b	52	48	71	77	102	105	66	35	23	35	34	58	138	235	3-'41	198
421*	45	39	30	60	100	99	63	31	19	31	34	41	146	255	6-'11	230
422*	115	98	97	55	38	33	16	6	8	19	53	104	150	260	1-'80	222
422a	161	100	85	66	35	29	17	6	4	17	50	79	141	198	1-'38	188
422b	127	124	94	71	49	21	15	17	8	13	62	115	172	194	1-'38	175
423	110	94	87	60	34	22	14	7	8	24	60	92	148	244	4-'36	232
424	91	107	66	47	50	25	16	8	18	32	42	76	137	178	1-'17	176
424a*	140	116	93	40	30	41	28	9	8	52	66	177	177	177	12-'22	140
424b	138	100	94	63	48	56	25	16	21	22	57	84	175	415	1-'23	233
424c	125	94	86	43	43	40	17	14	9	23	67	93	149	235	1-'25	217
424d	56	73	62	87	106	118	87	35	28	23	40	60	149	227	6-'31	225
425	137	90	89	45	35	22	9	10	10	24	35	105	166	380	12-'26	300
426	92	85	72	43	31	16	11	4	7	17	40	87	123	191	12-'23	181
427*	88	78	62	40	38	22	15	5	6	20	31	73	106	280	1-'95	279