

***Part 7 Preliminary Hydrological Evaluation
Result***

PART 7 PRELIMINARY HYDROLOGICAL EVALUATION RESULTS

7.1 RUNOFF DATA

7.1.1 COLLECTED DATA IN HPPS2

There is difficulty for collecting long-term runoff data. In the former study as HPPS2, stations which had relatively long term runoff records were selected as the Key Stream Gauges. The runoff data of the key stream gauges was supplemented with supplemental stream gauges. 43 key stream gauges were selected in whole Indonesia. The data source is listed below.

- Research Institute for Water Resources Development under Ministry of Public Works (*Pusat Penelitian dan Pengembangan Sumber Daya Air: PUSAIR*, formerly DPMA): PUSAIR is in charge for data collection and data processing of runoff data in whole Indonesia, which is located in Bandung.
- PLN-LMK Observation Network: It is the observation network of rainfall, runoff and water level which was constructed by PLN, which is one of the counter parts of this study. PLN-LITBANG which is the research center of PLN is in charge of data collection and compilation.
- Project Reports: The runoff data collected from PUSAIR and PLN-LITBANG did not cover whole Indonesia. Existing hydrology reports on various hydropower and water resources development projects were collected to supplement the monthly runoff records especially in Kalimantan, Sulawesi and Irian Jaya where available runoff data were scarce and limited.

7.1.2 DATA COLLECTION

Runoff data of the key stream gauges which is recorded after HPPS2 is collected from PUSAIR and PLN-LITBANG in this study.

31 stations of the 43 key stream gauges have station ID of PUSAIR. Daily runoff records at 27 stations of 31 are collected.

5 stations of the 43 key stream gauges have station ID of PLN. Daily runoff records at 2 stations of 5 and daily water level records at 2 stations of 5 are collected. Data collection and

compilation in PLN does not work effectively in recent years, after the responsibility of observation transferred to local branch of PLN from head office in 1993. It works only in West Java province and West Sumatra province. The list of station is shown in Table 1 and data availability is presented in Figure 1. The runoff data is attached in Appendix.

9 stations of the 43 key stream gauges were collected from project reports in HPPS2. Additional data at these stations cannot be collected and only data at surrounding stations is collected with cooperation of PLN-LITBANG. The list of station is shown in Table 1 and data availability is presented in Figure 1. The runoff data is attached in Appendix.

7.1.3 DATA AVAILABILITY OF HYDROLOGICAL DATA

There are forty three of the key stream gauges in whole Indonesia. Runoff data at 29 stations of 43 are collected in this study. The list of key stream gauges is shown in Table 2 and data availability is presented in Figure 2.

7.2 RAINFALL DATA

7.2.1 COLLECTED DATA IN HPPS2

In HPPS2, rainfall data were collected in/around basins of 20 stations of the 43 key stream gauges, and the basin mean rainfall was calculated with arithmetic mean. There were scarce rainfall data in/around the other 23 stations.

7.2.2 DATA AVAILABILITY OF HYDROLOGICAL DATA

Additional rainfall data in/around basins of key stream gauges which is recorded after HPPS2 is collected from BMKG. Besides, rainfall data stored in Hydro-Inventory Database (HIDB) constructed in HPPS2 is collected. The list of stations is shown in Table 3 and Table 4. The data is attached in Appendix.

7.3 LOWFLOW ANALYSIS

7.3.1 GENERAL APPROACH

In HPPS2, monthly runoff records at the key stream gauges were supplemented by monthly runoff records at surrounding stations, and then the data was extended to 30 years with Synthetic Flow Analysis. Non-dimensional runoff data was calculated from the extended runoff data. In each project scheme, a duration curve or a storage-draft curve could be

estimated from non-dimensional runoff data with a catchment area and a basin mean rainfall.

In this study, lowflow of the key stream gauges is estimated with calculating the change of rate of runoff or rainfall from HPPS2 to the present.

7.3.2 RUNOFF ESTIMATION

1) Monthly Mean Runoff Calculation

Monthly mean runoff is calculated in the following procedure, because the collected data in this study is on daily basis.

If there is only less than 15 daily runoff data in a month, then the monthly runoff is decided as missing. If there is more than 16 daily runoff data in a month, then the monthly runoff is calculated with averaging daily runoff records in the month. The list of calculated monthly runoff data is listed in Table 5 to Table 47.

2) Difference between lowflow in HPPS2 and additional lowflow in this study

The difference between lowflow in HPPS2 and additional lowflow in this study is estimated in the following equation.

$$Q = (Q_H * N_H + Q_A * N_A) / (N_H + N_A)$$

$$Rc = \frac{Q}{Q_H} - 1$$

- where, Q : Calculated runoff (m³/s)
 Q_H : Annual mean runoff estimated in HPPS2 (m³/s)
 Q_A : Annual mean runoff of collected runoff data in this study (m³/s)
 N_H : Number of data in HPPS2
 N_A : Number of data collected in this study
 Rc : Rate of change

The result is listed in Table 48.

7.3.3 RAINFALL ESTIMATION

In the previous chapter, lowflow at 23 station of the 43 key stream gauges are estimated, however there is no runoff data at the other 20 stations. Then there are rainfall records at 7 stations of 20 stations, and lowflow were estimated with rainfall records.

Basin mean rainfalls are estimated with the following two methods in HPPS2.

- A basin mean rainfall is estimated with arithmetic mean method, if there are rainfall gauging stations in/around the basin.
- A basin mean rainfall is estimated with Isohyetal map, if there is no rainfall gauging station in/around the basin.

The changing rates of basin mean rainfalls at the key stream gauges are calculated here, where the basin mean rainfall is estimated with arithmetic mean method. The equation is shown in below.

$$R_i = \frac{(R_{iH} * N_{iH} + R_{iA} * N_{iA})}{(N_{iH} + N_{iA})}$$

$$Rc_i = \frac{R_i}{R_{iH}} - 1$$

$$Rc = \frac{\sum_i^n Rc_i}{n}$$

- where, R_i : Calculated rainfall at station “i” (mm)
 R_{iH} : Annual rainfall in HPPS2 at station “i” (mm)
 R_{iA} : Annual rainfall calculated from collected data in this study at station “i” (mm)
 N_{iH} : Number of data in HPPS2 at station “i”
 N_{iA} : Number of data collected in this study at station “i”
 Rc_i : Rate of change at station “i”
 Rc : Rate of change
 n : Number of stations

The results are presented in Table 49 to Table 56.

7.3.4 LOWFLOW ANALYSIS

The results of lowflow analysis are shown in Table 57. The lowflow analysis with rainfall records is given by the following equation.

$$Q = Q_H \times (Rc + 1)$$

- where, Q : Calculated runoff (m³/s)
 Q_H : Annual mean runoff estimated in HPPS2 (m³/s)
 Rc : Rate of change

7.4 FOLLOW UP OF WATER LEVEL GAUGES PROPOSED IN HPSS2

Installation of new water level gauges at 21 basins was proposed in HPSS2.

The result of proposal is confirmed in this study with cooperation of PLN-LITBANG. It is found that four gauges are operated presently. The list of basins is shown in below.

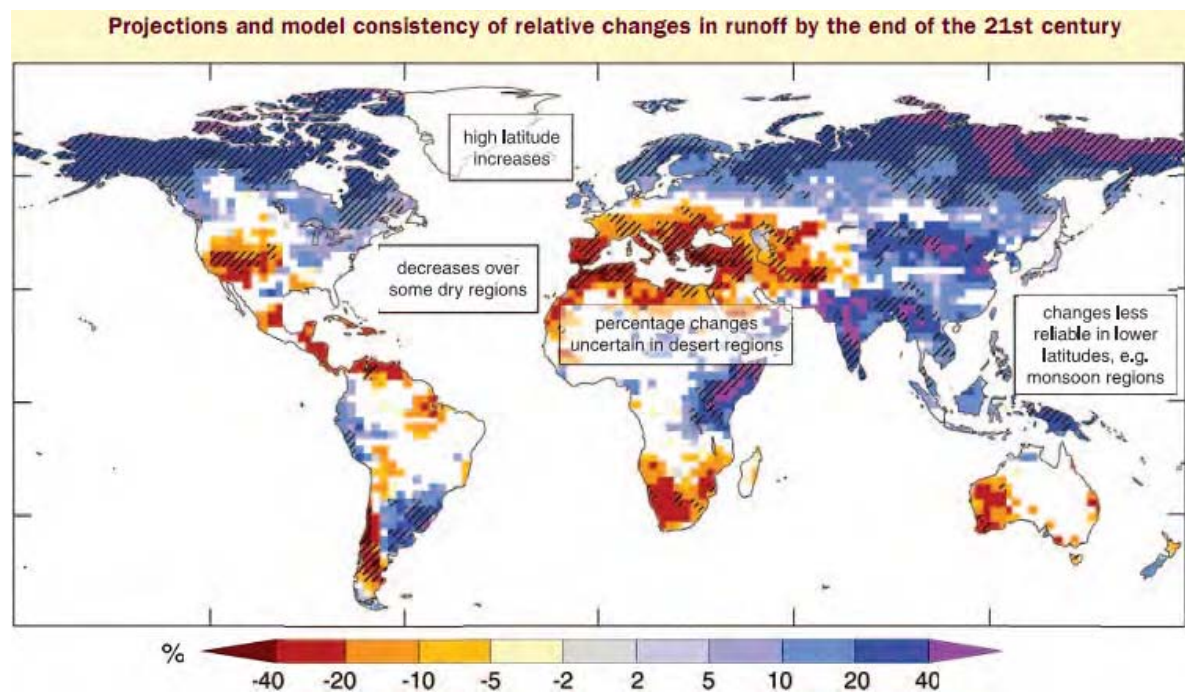
River Basin	Basin No.	Island	Major Scheme	Present Status
A. Padang Guci	113	Sumatera	Padang Guci-2	-
Bt. Indrapura	141	Sumatera	Air Batang-1 & 2	-
Bt. Airtuik	147	Sumatera	Tumpatih-1, Air Tuik	-
Bt. Anai	155	Sumatera	Anai-1	-
A. Kolang	183	Sumatera	Raisan-1	-
S. Sembakung	003	Kalimantan	Sembakung-3	-
S. Sesayap	004	Kalimantan	Sesayap-4, 11, 12, 15, & 20	-
S. Karana	100	Sulawesi	Karana-1 & 2	-
S. Lariang	106	Sulawesi	Lariang-6, 7, 8, & 9	active
S. Tuuga	013	Irian Jaya	Jawee-2, 3 & 4, Endere-1 & 2	-
S. Omba	015	Irian Jaya	Titinima-3	-
S. Mareder	020	Irian Jaya	Mareder	active
S. Mutri	026	Irian Jaya	Muturi-1	-
S. Kladuk	032	Irian Jaya	Kladuk-1 & 2	-
S. Waryori	036	Irian Jaya	Waryori-4	-
S. Ransiki	037	Irian Jaya	Gita/ Ransiki-1	-
S. Wapoga	043	Irian Jaya	Derewo-6 & 7	-
S. Caraulun	012	Timor	Be Lulic-1	-
W. Mala	002	Seram	Mala-1 & 2	active
W. Tala	012	Seram	Tala	active
Pulau Taliabu	013	Taliabu, Maruku	Wei Miha	-

7.5 PREDICTION OF CLIMATE CHANGE

The fourth assessment report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) has been published in 2007. AR4 prediction about rainfall and runoff is listed below.

- Heavy precipitation events frequency increases over most areas 'very likely'.
- Area affected by drought increase 'likely'.

Focusing runoff in Indonesia, it has been predicted that annual mean runoff slightly increase as following figure.



Source: IPCC AR4 SYR Figure3.5

Table 1 List of Collected Data from PLN-LITBANG

No.	Station Name	River Basin	Province	Key Stream Gauges on HPPS2			Result from PLN-Puslitbang				Comment	
				Gauge ID by HPPS2	Gauge ID by DPMA	Gauge ID by PLN-LMK	Supplemented by the Project	Station Name	River	Water Level		Runoff
A. Sumatra												
16	Despetah	A. Musi	Bengkulu	01-074-01-02	-	01-074-17	x	Despetah	Musi	Available	Available	Observable Water Level may be influenced by water level of PLTA Musi.
B. Kalimantan												
17	Siat damsite	S. Kapuas	W. Kalimantan	-	-	-	x	-	-	-	-	-
18	Kelai-2 damsite	S. Berau	E. Kalimantan	-	-	-	x	Lesan Dayak Long Lanuk	Kelai Kelai	Available Available	Not Available Available	-
C. Sulawesi												
21	Tulabolo	S. Bone	N. Sulawesi	04-003-01-01	-	04-003-01	-	-	-	-	-	-
22	Tincep	S. Munte	N. Sulawesi	04-127-01-01	-	04-127-01	-	Tincep	Munte	Available	Not Available	-
23	Palili	S. Palu	C. Sulawesi	04-112-02-02	04-112-00-01	04-112-01	x	Palili	Gumbasa	Not Available	Available	-
27	Bakaru	S. Sadang	S. Sulawesi	04-093-03-01	04-093-00-14	-	-	Tombo-Bakaru	Mamasa	Available	Available	DPMA station Bakaru was replaced by Tombo-Bakaru.
D. Jawa												
29	Cibuni-3 damsite	Cibuni	W. Jawa	-	-	-	x	Tanggeung Pamadangan	Cibuni Cibuni	Available Available	Available Available	-
34	Kaulon	K. Brantas	E. Jawa	02-057-01-08	02-057-03-05	-	-	-	-	-	-	-
E. Irian Jaya												
36	PLTM Werba	S. Werba	Irian Jaya	-	-	-	x	-	-	-	-	-
37	PLTA Warsamson	S. Warsamson	Irian Jaya	-	-	-	x	Malanu	Warsamson	Available	Not Available	-
38	PLTA Genyem	S. Sermo	Irian Jaya	-	-	-	x	-	-	-	-	-
F. Bali												
39	Buangga	Tk. Ayung	Bali	07-022-01-01	07-021-00-03	07-016-01	x	Buangga	Ayung	Available	Not Available	-
H. Halmahera												
41	PLTM Ira	A. Ira	Maluku	-	-	-	x	Igabola	Ira	Available	Not Available	PLTM Ira station was replaced by Igabola.
I. Seram												
42	PLTA Isal-2	Wai Isal	Maluku	-	-	-	x	Lele Sirata	Isal	Available	Not Available	PLTA Isal-2 station was replaced by Lele Sirata.
J. Timor												
43	PLTA Ira Lalaro	Ira Siquiro	E. Timor	-	-	-	x	-	-	-	-	-

Table 2 List of Key Stream Gauges

No.	Station Name	Key Stream Gauges on HPPS2			River Basin	Province	Supplement of Missing Data	Follow up in 2010	
		Gauge ID by HPPS2	Gauge ID by DPMA	Gauge ID by PLN				Availability	Source
A. Sumatera									
1	Lhok Nibong	01-027-01-01	01-027-00-02	-	Kr. Jambu Aye	D.I. Aceh	Surrounding Stations	Available	PUSAIR
2	Stabat	01-040-01-01	01-040-00-01	-	S. Wampu	N. Sumatera	Surrounding Stations	Available	PUSAIR
3	Lb. Sipelanduk	01-055-03-02	01-056-00-01	-	Bt. Pane	N. Sumatera	Surrounding Stations	Available	PUSAIR
4	Lb. Bendahara	01-058-02-01	01-058-00-02	-	S. Rokan	Riau	Surrounding Stations	Available	PUSAIR
5	Tj. Ampalu	01-066-04-01	01-066-00-04	-	Bt. Indragiri	W. Sumatera	Surrounding Stations	Available	PUSAIR
6	Sungai Dareh	01-071-01-01	01-071-00-01	-	Bt. Hari	W. Sumatera	Surrounding Stations	Available	PUSAIR
7	Muara Inum	01-071-02-01	01-071-00-08	-	Bt. Hari	Jambi	Surrounding Stations	Available	PUSAIR
8	Martapura	01-074-01-01	01-074-00-44	-	A. Musi	S. Sumatera	Project Report	Available	PUSAIR
9	Banjarmasin	01-077-02-07	01-077-00-09	-	W. Ti. Bawang	Lampung	Surrounding Stations	Available	PUSAIR
10	Kunvir	01-080-01-04	01-080-00-07	-	W. Sekampung	Lampung	Surrounding Stations	Available	PUSAIR
11	Kp. Darang	01-001-01-01	01-001-00-03	-	Kr. Aceh	D.I. Aceh	Surrounding Stations	Available	PUSAIR
12	Tui Kareng	01-205-01-01	01-205-00-01	-	Kr. Teunom	D.I. Aceh	Surrounding Stations	Available	PUSAIR
13	Hp. Baru	01-178-01-01	01-178-00-02	-	Bt. Toru	N. Sumatera	Surrounding Stations	Available	PUSAIR
14	Air Batu	01-141-01-01	01-141-00-01	-	Bt. Indrapura	W. Sumatera	Surrounding Stations	Available	PUSAIR
15	Air Gadang	01-165-01-01	01-165-00-02	-	Bt. Pasaman	W. Sumatera	Surrounding Stations	Available	PUSAIR
16	Despetah	01-074-01-02	-	01-074-17	A. Musi	Bengkulu	Project Report	Available	PLN-LITBANG
B. Kalimantan									
17	Silat damsite	-	-	-	S. Kapuas	W. Kalimantan	Project Report	Not Available	-
18	Kelai-2 damsite	-	-	-	S. Berau	E. Kalimantan	Project Report	Not Available	-
19	Sei Langsat	03-026-01-01	03-026-00-01	-	S. Martapura	S. Kalimantan	Project Report	Available	PUSAIR
20	Panaan	03-027-07-02	03-026-00-45	-	S. Barito	C. Kalimantan	Project Report	Available	PUSAIR
C. Sulawesi									
21	Tulabolo	04-003-01-01	-	04-003-01	S. Bone	N. Sulawesi	Surrounding Stations	Not Available	-
22	Tincep	04-127-01-01	-	04-127-01	S. Munte	N. Sulawesi	Surrounding Stations	Not Available	-
23	Palili	04-112-02-02	04-112-00-01	04-112-01	S. Palu	C. Sulawesi	Project Report	Available	PLN-LITBANG
24	Gillirang	04-072-01-01	04-072-00-01	-	S. Gillirang	S. Sulawesi	Project Report	Available	PUSAIR
25	Bila	04-073-03-01	04-073-00-04	-	S. Cenranae	S. Sulawesi	Project Report	Available	PUSAIR
26	Likupande	04-083-01-01	04-083-00-01	-	Jene Klara	S. Sulawesi	Surrounding Stations	Available	PUSAIR
27	Bakaru	04-093-03-01	04-093-00-14	-	S. Sadang	S. Sulawesi	Surrounding Stations	Not Available	-
D. Jawa									
28	Kebon Randu	02-107-06-01	02-107-02-05	-	Cimandiri	W. Jawa	Surrounding Stations	Available	PUSAIR
29	Cibuni-3 damsite	-	-	-	Cibuni	W. Jawa	Project Report	Not Available	-
30	Rangkasbitong	02-006-01-02	02-006-03-02	-	Ciujung	W. Jawa	Project Report	Available	PUSAIR
31	Leuwi Goong	02-026-01-06	02-026-02-01	-	Cimanuk	W. Jawa	Surrounding Stations	Available	PUSAIR
32	Krangan-2	02-082-01-06	02-082-01-02	-	K. Progo	C. Jawa	Surrounding Stations	Available	PUSAIR
33	Banyumas	02-090-01-03	02-090-06-01	-	K. Serayu	C. Jawa	Surrounding Stations	Available	PUSAIR
34	Kaulon	02-057-01-08	02-057-03-05	-	K. Brantas	E. Jawa	Surrounding Stations	Not Available	-
35	Wonorejo	02-074-01-01	02-074-02-06	-	K. Bondoyudo	E. Jawa	Surrounding Stations	Available	PUSAIR
E. Irian Jaya									
36	PLTM Werba	-	-	-	S. Werba	Irian Jaya	Project Report	Not Available	-
37	PLTA Warsamson	-	-	-	S. Warsamson	Irian Jaya	Project Report	Not Available	-
38	PLTA Genyem	-	-	-	S. Sermo	Irian Jaya	Project Report	Not Available	-
F. Bali									
39	Buangga	07-022-01-01	07-021-00-03	07-016-01	Tk. Ayung	Bali	Project Report	Not Available	-
G. Lombok									
40	Santong	08-005-01-01	08-005-00-01	-	K. Sidutan	W. Nusa Tenggara	Project Report	Available	PUSAIR
H. Halmahera									
41	PLTM Ira	-	-	-	A. Ira	Maluku	Project Report	Not Available	-
I. Seram									
42	PLTA Isal-2	-	-	-	Wai Isal	Maluku	Project Report	Not Available	-
J. Timor									
43	PLTA Ira Lalaro	-	-	-	Ira Siquiro	E. Timor	Project Report	Not Available	-

Table 3 List of Rainfall Stations in/around Key Stream Gauges (1/2)

Region	Rainfall Stations in/around Key Stream Gauges in HPPS2 (Monthly)						Rainfall Station		Follow up in 2010 (monthly)									
	No.	Station Name	Gauge ID by HPPS2	River Basin	River	C.A. (km2)	No.	Station Name	Gauge ID by BMG	Availability	Source							
A. Sumatera	2	Stabat	01-040-01-01	S. Langkat	S. Wampu	3,870	1	Selesai		Available	BMKG							
							2	Kabanjahe										
							3	Polonia	127I	Available	BMKG							
							4	Bukit Lawang	133C	Available	BMKG							
							5	Batan Serangan										
							6	Bungara										
							7	Marike	132D									
							8	Padang Brahrang										
							9	Turangi										
							10	Blang Kahan	129D	Available	BMKG							
							11	Rambutan	140F	Available	BMKG							
							12	Tanjung Kelling	133B									
	6	Sungai Dareh	01-071-01-01	Bt .Hari	Bt .Hari	4,452	13	Muarah Labuh	29									
							14	Surian	38B	Available	BMKG							
							15	Sukarami	27A									
							16	Sitiung	36B	Available	BMKG							
							17	Pulau Punjung	49G									
							18	Lubuk Gadang	30									
							19	Huberta	28C	Available	BMKG							
							20	Geumpang	104b	Available	BMKG							
	12	Tui Kareng	01-205-01-01	Kr. Teunom	Kr. Teunom	2,403	21	Tangse	104a	Available	BMKG							
							22	Blangpidie	97c	Available	BMKG							
							23	Meulaboh	102									
	13	Hapesong Baru	01-178-01-02	Bt. Toru	Bt. Toru	2,773	24	Batang Toru	80									
							25	Tarutung	84									
							26	Hutaraya	84C	Available	BMKG							
							27	Sibolga	02104									
							28	Baligi	86B	Available	BMKG							
							29	Simangunban										
30							Lumpangiri Kiri											
B. Kalimantan	19	Sei Langsat (Riam Kiwa damsite)	03-026-01-01	S. Martapura	S. Riam Kiw	1,420	31	Rantau	306									
							32	Lampinit										
							33	Tatakan										
							34	Atayo	308D	Available	BMKG							
							35	Ulin	308I	Available	BMKG, HIBD							
							36	Lawa-Lawa	308K	Available	BMKG, HIBD							
							37	Binuang	307B	Available	BMKG, HIBD							
							38	Pengaron	307	Available	HIBD							
							20	Panaan	03-027-07-02	S. Barito	S. Tabalong	1,333	39	Hayap	299			
													40	Tanjung	301			
	41	Batu Mandi	303A															
	42	Barabai	305															
	43	Negara	305B	Available	BMKG													
	44	Rantau	306															
	C. Sulawesi	22	Tincep	04-127-01-01	S. Munte	S. Munte							54	45	Tondano	336	Available	HIBD
														46	Tomohon	338		
							47	Noongan	339A	Available	HIBD							
							48	Tanawangko	341	Available	HIBD							
23		Palili	04-112-02-02	S. Palu	S. Lindu	593	49	Donggala	363	Available	HIBD							
							50	Parigi	365	Available	HIBD							
							51	Poso	385	Available	BMKG							
							52	Lembasida	363G									
	53						Una-Una	366										
	54						Bila	399G	Available	BMKG								
24	Gillirang	04-072-01-01	S. Gillirang	S. Gillirang	230	55	Sakkoli	403D	Available	BMKG								
						56	Barukku	399C	Available	BMKG								
						57	Siwa	400B	Available	BMKG								
						58	Panekei	400H										
						59	Paria	404B	Available	BMKG								
						25	Bila	04-073-03-01	S. Cenranae	S. Bila-Hilir	379	60	Enrekang	400				
61	Baraka	400F	Available	BMKG														
62	Barukku	399C	Available	BMKG														
63	Bila	399G	Available	BMKG														
64	Paria	404B	Available	BMKG														
65	Paneki	400H	Available	BMKG														
66	T. Tedong	403D																

Table 4 List of Rainfall Stations in/around Key Stream Gauges (2/2)

Region	Rainfall Stations in/around Key Stream Gauges in HPPS2 (Monthly)						Rainfall Station		Follow up in 2010 (monthly)		
	Key Stream Gauge						No.	Station Name	Gauge ID by BMG	Availability	Source
	No.	Station Name	Gauge ID by HPPS2	River Basin	River	C.A. (km2)					
D. Jawa	28	Kebon Randu	02-107-06-01	Cimandiri	Cicatih	486	67	Sukabumi	57		
							68	Cikidang	10		
							69	Tijpetir			
							70	Sukamaju	12		
							71	Cikembang	45		
							72	Cibunar	36	Available	BMKG
	29	Cibuni-3 damsite		Cibuni	Cibuni	1,124	73	Ubrug	45A	Available	BMKG
							74	Ciburayut	61		
							75	Cimenteng	54C		
							76	Sukanegara	98		
							77	Pagelaran	109A	Available	BMKG
							78	Citambur	129		
30	Rangkasbitung	02-006-01-02	Ciujung	Ciujung	1,383	79	Cibuni	133	Available	HIDB	
						80	Dinewati	65			
						81	Agrabintana	114A	Available	BMKG, HIDB	
						82	Cilaki	43B	Available	BMKG	
						83	B. Irigasi	44A	Available	BMKG	
						84	Rangkasbitung	37			
						85	Cikadu	37B	Available	BMKG	
						86	Cimarga	37E	Available	BMKG	
						87	Cisalak	37F			
						88	Peudeuy	38A			
31	Leuwi Goong	02-026-01-06	Cimanuk	Cimanuk	760	89	W. Guning	26C			
						90	Padeglang	26			
						91	Pamegatan	213A	Available	BMKG	
						92	K. Pawitan	205C	Available	BMKG	
						93	Toragong	205B	Available	BMKG	
						94	Sumedang	194	Available	BMKG	
						95	Ujungjaya	193			
						96	Panjalu	223			
32	Krangan -2	02-082-01-06	K. Progo	K. Progo	423	97	Badran	87			
						98	Plered	88			
						99	Temanggung	86	Available	BMKG	
						100	Seneng	80			
						101	Pakis	98A	Available	BMKG	
						102	Kebraman	79			
						103	K. Angkrik	75			
33	Banyumas	02-090-01-03	K. Serayu	K. Serayu	2,632	104	B. Raden	25			
						105	B. Sari	26			
						106	T. Gering	26A	Available	BMKG	
						107	Klampok	36B	Available	BMKG	
						108	Adipala	44			
						109	Rumput	46C			
34	Kaulon	02-057-01-08	K. Brantas	K. Brantas	2,620	110	K. Gesing	60			
						111	Semen	153	Available	HIDB	
						112	Wlingi	164	Available	HIDB	
						113	Batu	7	Available	BMKG, HIDB	
						114	Singosari	51	Available	HIDB	
						115	Doko	165	Available	HIDB	
						116	Dampit	28	Available	BMKG	
						117	Kepanjen	39	Available	HIDB	
35	Wonorejo	02-074-01-01	K. Bondoyudo	K. Bondoyudo	314	118	Ranukiakah	180			
						119	Widodoren	24			
						120	Candipura	188			
						121	G. Sawur	188B	Available	BMKG	
						122	S. Jambe	209E			
						123	Watu Urip	20			
I. Seram	42	PLTA Isal-2 dams		Wai Isal	Wai Isal	242	124	Manusela	485A	Available	HIDB
							125	Wahai	486	Available	HIDB
							126	Riring	487C	Available	BMKG
J. Timor	43	PLTA Ira Lalaro d		Ira Siquiro	Ira Siquiro	406	127	Tutuata	690C	Available	HIDB
							128	Los Palos	690B	Available	HIDB

Legend: BMKG (Badan Meteorologi Klimatologi dan Geofisika), HIDB (Hidro-InVENTORY Database in HPPS2)

Table 5 Supplemented Monthly Runoff and Collected Monthly Runoff Records (1/43)

No: 1 River Basin: Kr. Jambu Aye
 Station Name: Lhok Nibong River: Kr. Jambu Aye
 Station ID by HPPS2: 01-027-01-01 Catchment Area (km2): 4,583

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	79.1	91.7	45.0	122.0	181.7	127.5	46.1	49.4	158.5	223.3	381.2	321.5	152.3
1973	218.3	78.4	92.2	122.2	210.7	251.2	101.2	109.7	156.8	203.5	261.1	297.3	175.2
1974	232.1	174.0	136.8	152.9	222.1	145.6	124.1	129.2	134.9	126.8	198.7	112.4	157.5
1975	113.9	70.4	103.1	179.1	158.0	79.0	128.0	64.2	132.1	167.3	236.2	352.9	148.7
1976	184.0	102.9	144.1	145.3	182.4	108.5	78.2	67.8	74.4	106.6	324.8	275.0	149.5
1977	192.8	128.5	63.7	69.1	162.8	92.4	102.7	118.2	151.4	348.9	353.5	509.1	191.1
1978	251.7	153.6	124.6	152.6	212.9	140.0	108.5	109.7	156.8	178.6	281.0	306.9	181.4
1979	104.0	69.2	57.0	137.7	176.7	140.7	98.3	76.3	138.4	143.4	323.0	148.7	134.5
1980	61.1	71.0	156.0	76.4	140.0	104.0	107.0	123.0	80.6	149.0	281.0	319.0	139.0
1981	318.0	113.0	121.0	114.0	382.0	155.0	98.2	74.7	135.0	174.0	187.0	226.0	174.8
1982	61.9	65.6	71.1	252.0	268.0	88.7	58.7	71.8	86.4	150.0	228.0	209.0	134.3
1983	198.0	50.5	80.8	56.8	148.0	109.0	128.0	88.8	157.6	195.2	181.7	236.7	135.9
1984	272.0	278.0	222.0	128.0	241.0	164.0	113.0	78.3	73.2	142.0	153.0	311.0	181.3
1985	132.0	125.0	152.0	102.0	221.0	84.3	55.9	75.9	95.5	227.0	253.0	280.0	150.3
1986	323.0	108.0	70.6	157.0	129.0	117.0	54.8	47.7	79.6	153.0	193.0	329.0	146.8
1987	181.7	164.3	155.2	272.2	187.8	189.8	185.8	183.7	172.9	375.7	308.4	305.3	223.6
1988	412.0	136.0	90.0	200.0	164.0	152.0	69.7	179.0	195.0	111.0	151.0	233.0	174.4
1989	103.0	72.0	108.0	98.3	206.0	62.8	87.9	113.0	123.0	70.1	93.4	163.0	108.4
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	159.0	103.0	110.0	142.0	205.0	155.0	98.7	181.0	313.0	342.0	256.0	414.0	206.6
1992	361.0	383.0	281.0	238.0	332.0	259.0	150.0	190.0	239.0	301.0	363.0	354.0	287.6
1993	198.0	239.0	232.0	287.0	352.0	287.0	295.0	180.0	438.0	436.0	529.0	578.0	337.6
Ave	197.9	132.2	124.6	152.6	213.5	143.5	109.0	110.1	156.8	205.9	263.7	299.1	175.7
Num													21

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	400.5	417.3	279.8	431.4	384.6	174.1	146.2	84.6	165.6	282.7	391.6	189.0	278.9
1995	163.0	150.8	237.4	313.1	206.1	118.5	105.5	193.8	173.8	235.6	571.7	270.6	228.3
1996	262.6	349.4	83.1	184.5	235.8	182.4	128.6	138.6	153.0	182.2	274.8	421.1	216.3
1997	70.7	70.7	190.0	175.3	69.2	-	-	-	-	-	-	-	-
Ave	224.2	247.1	197.6	276.1	223.9	158.3	126.7	139.0	164.1	233.5	412.7	293.6	241.2
Num													3

Table 6 Supplemented Monthly Runoff and Collected Monthly Runoff Records (2/43)

No: 2 River Basin: S. Wampu
 Station Name: Stabat River: S. Wampu
 Station ID by HPPS2: 01-040-01-01 Catchment Area (km2): 3,870

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	114.1	126.1	118.0	116.9	127.9	121.7	113.9	112.1	118.9	131.9	128.4	141.1	122.6
1973	158.0	129.6	123.5	126.1	135.2	133.5	118.5	133.3	116.2	125.8	123.8	135.2	129.9
1974	225.0	267.6	192.2	193.9	195.1	181.2	184.9	187.3	267.2	246.3	254.5	197.6	216.1
1975	181.6	186.5	134.9	189.4	161.5	162.2	144.6	110.8	216.1	149.3	220.7	441.5	191.6
1976	264.5	225.2	136.9	195.4	181.6	145.1	162.9	149.4	151.3	210.2	390.4	369.7	215.2
1977	248.9	166.0	212.0	135.9	126.2	112.9	108.5	117.1	173.4	349.3	391.6	291.1	202.7
1978	207.4	155.9	163.3	163.6	151.2	141.9	152.2	93.1	161.1	304.5	386.2	306.3	198.9
1979	201.6	160.4	116.7	119.9	118.8	159.6	187.2	128.6	153.5	232.8	356.2	300.2	186.3
1980	153.2	135.6	219.5	152.3	178.0	150.3	116.6	257.0	220.9	191.9	382.6	400.4	213.2
1981	234.0	175.0	147.7	167.0	322.2	138.4	68.8	63.0	174.0	156.0	230.9	228.8	175.5
1982	143.0	167.7	188.7	329.0	277.0	197.0	133.0	92.3	117.7	260.3	339.2	332.0	214.7
1983	300.0	145.0	188.0	113.0	158.0	152.0	140.0	119.0	194.0	313.0	300.0	313.0	202.9
1984	253.0	268.0	270.0	188.7	315.0	158.0	150.0	129.0	103.0	159.0	174.0	228.0	199.6
1985	199.4	145.7	231.0	188.0	226.0	110.6	135.4	145.8	149.0	212.0	334.0	367.0	203.7
1986	262.0	234.3	179.0	204.0	140.0	128.0	125.5	108.4	207.0	404.0	351.0	305.0	220.7
1987	212.0	146.1	214.0	195.0	320.3	146.9	135.4	137.4	190.7	351.0	408.0	346.3	233.6
1988	266.0	178.0	186.5	179.0	209.3	146.9	135.4	231.4	284.6	253.3	327.6	325.2	226.9
1989	311.0	147.0	233.0	194.0	339.0	155.0	211.0	198.0	255.0	379.0	363.0	306.0	257.6
1990	211.0	165.0	151.0	156.0	237.0	188.0	128.0	201.0	153.0	269.0	240.0	271.0	197.5
1991	164.0	154.0	170.0	174.0	207.0	167.0	117.0	105.0	175.0	251.0	271.0	299.0	187.8
1992	201.0	140.0	134.0	136.0	117.0	101.4	87.4	126.0	121.0	377.0	409.0	517.0	205.6
1993	301.0	175.0	211.0	243.0	327.0	151.0	214.0	142.0	161.0	281.0	390.0	231.0	235.6
Ave	218.7	172.4	178.2	175.5	207.7	147.7	139.5	140.3	175.6	254.9	307.8	302.4	201.7
Num													22

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	198.2	282.5	222.3	287.9	299.1	250.8	144.3	128.3	222.8	228.9	335.1	233.3	236.1
1995	227.3	177.1	173.2	215.1	218.0	173.7	167.6	314.7	437.7	314.0	348.5	196.6	246.9
1996	112.7	196.6	78.5	89.8	113.0	103.4	61.6	66.5	134.5	102.8	126.8	315.4	125.1
1997	212.0	168.3	251.0	180.3	133.5	125.5	106.7	86.0	122.4	363.2	395.1	240.3	198.7
1998	147.2	90.9	85.0	52.8	51.6	64.1	99.7	138.8	100.9	154.8	203.9	178.9	114.1
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	298.9	165.3	170.9	192.4	246.8	188.4	202.3	224.7	246.2	-	-	419.3	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	340.6	-	151.9	171.9	341.1	183.8	218.7	306.6	393.7	321.7	389.2	419.2	-
2008	93.7	71.9	352.6	544.2	552.1	507.1	508.4	420.5	555.5	842.9	*	*	-
Ave	203.8	164.7	185.7	216.8	244.4	199.6	188.7	210.8	276.7	332.6	299.8	286.2	184.2
Num													5

Note: Maximum runoff in 2008 Nov. and Dec are much higher than others and judged as unreliable value.

Table 7 Supplemented Monthly Runoff and Collected Monthly Runoff Records (3/43)

No: 3 River Basin: Bt. Barumon
 Station Name: Lubuk Sipelanduk River: Bt. Pane
 Station ID by HPPS2: 01-055-03-02 Catchment Area (km²): 828

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	47.7	27.0	36.2	51.9	53.5	53.9	14.7	13.6	38.2	25.2	23.9	35.3	35.1
1974	32.6	38.0	29.5	45.6	30.0	19.1	14.5	9.0	22.8	22.0	13.2	38.0	26.2
1975	37.8	47.7	33.8	30.2	15.9	11.3	15.7	9.5	17.5	9.4	13.6	31.1	22.8
1976	27.4	28.7	38.6	47.5	19.2	20.9	10.1	12.5	7.5	25.3	42.0	45.7	27.1
1977	54.0	43.8	33.1	31.3	34.7	21.6	13.0	10.4	14.7	40.5	84.1	49.4	35.9
1978	31.1	50.0	50.3	46.0	33.0	14.9	10.7	7.2	7.1	16.1	46.4	43.7	29.7
1979	37.6	28.7	26.8	19.3	14.7	15.1	10.7	7.3	25.6	20.9	45.0	45.6	24.8
1980	40.1	15.9	41.0	37.1	34.6	23.0	10.3	16.0	12.7	17.7	21.2	17.8	24.0
1981	26.0	31.4	38.2	36.2	55.9	41.5	13.2	13.1	27.1	17.1	16.1	19.5	27.9
1982	15.3	25.6	51.8	74.9	52.1	16.9	10.8	7.3	8.9	25.5	40.6	35.6	30.4
1983	32.2	20.6	21.0	19.8	25.0	13.0	8.9	8.3	18.5	43.2	27.2	48.0	23.8
1984	43.5	50.8	47.3	38.2	43.1	22.0	19.9	13.9	41.0	7.2	29.9	34.0	32.6
1985	41.6	31.7	34.3	42.7	18.2	7.9	6.5	6.9	10.0	16.1	39.5	42.1	24.8
1986	44.2	29.9	66.3	54.6	32.3	24.2	12.7	12.9	14.6	15.0	16.7	29.4	29.4
1987	30.1	28.4	28.9	30.0	17.1	14.8	8.7	19.4	17.6	22.4	37.4	43.3	24.8
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	13.9	21.5	28.9	37.1	22.3	11.1	10.2	15.9	14.6	44.5	76.0	44.5	28.4
1990	36.9	49.1	30.4	32.4	30.3	11.1	19.3	9.9	14.4	36.2	38.2	75.7	32.0
1991	30.8	24.0	39.3	42.7	47.4	29.4	17.7	17.5	17.9	19.3	36.2	102.2	35.4
1992	41.2	21.5	15.5	30.4	23.7	3.2	5.6	7.6	11.3	11.9	63.1	53.8	24.1
1993	37.9	26.2	34.4	35.5	41.4	33.1	33.7	18.9	12.8	12.8	38.3	30.8	29.7
Ave	35.1	32.0	36.3	39.2	32.2	20.4	13.3	11.9	17.8	22.4	37.4	43.3	28.4
Num													20

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 8 Supplemented Monthly Runoff and Collected Monthly Runoff Records (4/43)

No: 4 River Basin: S. Rokan
 Station Name: Lubuk Bendahara River: S. Rokan Kiri
 Station ID by HPPS2: 01-058-02-01 Catchment Area (km2): 3,325

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1974	167.8	145.5	167.6	174.4	152.6	142.7	114.1	109.6	160.7	123.3	120.9	177.6	146.4
1975	134.0	131.6	135.6	168.5	121.3	109.3	132.5	109.6	159.3	116.4	93.0	101.0	126.0
1976	87.4	48.6	94.9	139.7	82.9	104.2	59.7	84.6	64.1	149.9	225.6	247.9	115.8
1977	164.5	177.8	117.8	151.1	138.6	86.8	73.1	60.2	57.3	109.3	303.0	228.9	139.0
1978	151.5	243.8	253.3	226.5	178.2	88.1	83.9	55.3	62.7	107.9	185.7	172.0	150.7
1979	204.5	130.6	97.3	139.2	107.8	139.8	66.4	54.4	108.8	69.0	288.6	222.8	135.8
1980	121.6	78.1	166.7	162.1	169.7	110.8	65.6	77.7	74.6	110.4	157.5	147.6	120.2
1981	152.4	110.3	143.8	178.8	181.7	124.4	67.2	43.6	89.5	134.1	91.0	103.7	118.4
1982	120.6	137.1	190.6	368.0	190.6	110.0	60.5	53.5	62.4	136.8	199.6	264.4	157.8
1983	229.0	96.5	94.9	94.5	134.0	123.0	98.1	71.5	167.6	126.3	72.5	171.2	123.3
1984	147.0	250.4	216.9	282.7	177.7	140.6	106.2	85.9	84.7	71.6	279.3	196.3	169.9
1985	141.7	134.8	132.6	152.2	161.5	125.7	123.3	127.0	157.2	153.0	178.0	158.0	145.4
1986	311.0	108.0	259.0	206.0	128.0	104.0	55.3	44.0	65.3	151.0	135.0	302.0	155.7
1987	120.7	110.6	130.7	144.8	161.1	122.0	115.3	152.2	152.4	187.2	148.7	146.3	141.0
1988	248.0	246.0	296.0	183.0	159.0	85.1	98.2	157.0	257.0	107.0	105.0	161.0	175.2
1989	137.6	118.1	134.3	123.3	126.3	110.3	106.9	121.1	145.2	156.3	181.1	140.7	133.4
1990	184.0	242.0	110.0	103.0	140.0	53.2	72.7	44.9	68.0	125.0	163.0	248.0	129.5
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	194.0	151.0	188.0	166.0	134.0	82.3	84.6	56.3	77.5	82.2	238.0	218.0	139.3
1993	170.0	104.0	254.0	149.0	254.0	104.0	101.0	63.2	115.0	169.0	257.0	236.0	164.7
Ave	167.8	145.5	167.6	174.4	152.6	108.7	88.7	82.7	112.1	125.6	180.1	191.8	141.5
Num													19

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1995	253.2	217.1	207.2	215.4	185.5	101.7	80.9	168.5	123.3	141.8	-	-	-
1996	149.0	169.3	127.2	191.8	106.2	115.5	89.3	85.2	94.8	114.0	112.0	116.0	122.5
1997	92.2	47.5	66.3	146.2	122.8	62.0	74.4	31.4	29.3	50.3	148.7	209.9	90.1
1998	227.1	150.8	109.8	202.5	129.1	36.0	71.6	155.6	152.6	82.6	88.3	136.7	128.6
1999	275.4	142.0	113.2	53.0	69.5	63.0	64.5	65.7	120.0	227.2	142.3	134.4	122.5
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	236.0	145.8	107.1	161.2	162.0	155.2	83.5	48.0	94.6	153.1	82.6	205.4	136.2
2008	106.8	77.2	246.0	187.8	66.6	71.6	-	-	-	188.4	108.5	150.6	-
Ave	191.4	135.6	139.5	165.4	120.2	86.4	77.4	92.4	102.4	136.8	113.7	158.8	120.0
Num													5

Table 9 Supplemented Monthly Runoff and Collected Monthly Runoff Records (5/43)

No: 5 River Basin: Bt. Indragiri
 Station Name: Tj. Ampalu River: Bt. Ombilin
 Station ID by HPPS2: 01-066-04-01 Catchment Area (km²): 2,215

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1975	94.3	122.6	36.8	76.0	48.0	35.4	46.8	47.9	64.2	39.7	40.0	30.0	56.8
1976	45.3	34.5	59.4	128.5	65.8	33.0	35.9	38.4	39.4	85.4	117.5	115.9	66.6
1977	122.1	109.1	95.2	128.9	129.2	64.6	31.2	28.9	21.9	30.3	137.9	152.7	87.7
1978	145.8	115.0	268.3	144.1	113.5	52.5	26.9	36.8	34.5	75.2	120.5	186.1	109.9
1979	118.4	730.5	106.6	134.4	77.3	71.7	40.7	30.4	46.7	52.1	177.5	169.2	146.3
1980	100.7	37.2	91.6	25.2	36.3	32.2	40.4	48.0	32.1	35.4	102.7	98.3	56.7
1981	87.3	69.1	85.4	106.6	97.3	63.2	34.4	32.8	36.7	48.2	32.9	87.4	65.1
1982	112.5	81.6	102.3	162.0	104.2	80.7	28.3	18.0	14.7	15.8	76.4	145.6	78.5
1983	153.2	64.3	116.0	105.8	92.0	44.4	35.6	46.9	46.0	44.3	41.7	72.3	71.9
1984	94.4	71.8	82.6	121.1	72.9	90.8	39.7	20.5	21.2	25.9	132.4	86.0	71.6
1985	88.8	93.1	81.9	56.8	57.3	25.5	17.7	14.4	23.8	38.0	66.6	43.6	50.6
1986	149.0	44.6	184.9	104.6	80.8	62.5	40.7	13.9	50.8	56.1	111.1	60.9	80.0
1987	101.0	78.8	91.0	86.3	12.9	40.4	19.2	18.8	21.2	68.8	73.8	63.6	56.3
1988	92.3	80.3	143.0	120.0	99.7	39.1	37.4	28.5	28.8	93.3	89.1	117.0	80.7
1989	92.2	96.9	49.3	47.2	33.7	18.4	22.0	22.8	38.1	92.8	97.8	133.0	62.0
1990	129.0	147.0	125.0	120.0	99.6	37.1	45.2	42.2	70.7	156.0	136.0	249.0	113.1
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	51.1	119.6	120.7	94.0	60.9	38.2	75.2	37.8	19.5	19.0	63.6	123.6	68.6
1993	35.5	114.0	104.2	98.1	68.7	68.7	57.5	33.1	36.1	62.5	141.2	63.7	73.6
Ave	100.7	122.8	108.0	103.3	75.0	49.9	37.5	31.1	35.9	57.7	97.7	111.0	77.6
Num													18

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1995	135.1	167.4	101.0	97.7	128.5	64.0	48.8	55.9	67.4	75.4	36.8	100.9	89.9
1996	75.6	96.3	121.8	114.3	37.0	40.3	42.3	33.9	45.5	54.7	47.4	38.3	62.3
1997	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	85.7	66.0	53.4	33.5	51.7	58.6	53.8	101.3	106.8	50.2	26.9	36.7	60.4
1999	67.9	57.5	65.6	26.6	61.0	11.4	7.2	6.2	42.3	79.5	42.4	74.8	45.2
2000	62.6	9.4	11.6	11.2	8.3	8.2	5.5	44.8	37.9	24.4	70.3	59.5	29.5
2001	*	*	*	*	*	*	*	*	*	*	*	*	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	*	*	*	*	*	*	*	*	*	*	*	*	-
2005	*	*	*	*	*	*	*	*	*	*	*	*	-
2006	*	*	*	*	*	*	*	*	*	*	*	*	-
2007	*	*	*	*	*	*	*	*	*	*	*	*	-
2008	*	*	*	*	*	*	*	*	*	*	*	*	-
Ave	85.4	79.3	70.7	56.7	57.3	36.5	31.5	48.4	60.0	56.9	44.8	62.0	57.5
Num													5

Note: Maximum Runoff and baseflow after 2001 become smaller than before, and judged as unreliable value.

Table 10 Supplemented Monthly Runoff and Collected Monthly Runoff Records (6/43)

No: 6 River Basin: Bt. Hari
 Station Name: Sungai Dareh River: Bt. Hari
 Station ID by HPPS2: 01-071-01-01 Catchment Area (km²): 4,452

Supplemented Monthly Runoff in HPPS2													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1975	382.7	284.2	182.0	332.8	212.8	158.7	207.6	212.5	282.1	177.0	178.4	135.4	228.9
1976	201.0	155.0	261.5	558.3	289.1	148.4	160.9	171.4	176.0	373.1	511.0	504.2	292.5
1977	531.0	474.8	415.2	559.8	561.4	284.0	221.4	209.1	149.2	152.7	462.1	593.2	384.5
1978	484.5	311.8	708.1	493.4	385.0	174.5	141.5	106.1	138.6	240.5	395.9	702.1	356.8
1979	428.2	161.7	342.7	482.4	355.7	414.3	250.4	170.3	207.2	265.8	770.9	535.4	365.4
1980	438.8	219.5	399.9	138.1	162.5	145.1	145.5	134.5	146.4	273.5	385.5	254.5	237.0
1981	219.3	210.0	507.2	629.9	374.6	212.0	198.0	210.9	314.9	400.4	277.9	349.5	325.4
1982	401.0	309.6	340.3	535.0	403.1	364.8	182.4	115.6	85.9	115.9	238.2	633.3	310.4
1983	797.7	388.1	422.1	507.8	416.7	238.8	228.1	225.7	250.5	235.7	215.4	342.0	355.7
1984	586.0	294.6	355.8	451.6	475.0	335.6	270.0	162.9	176.2	193.4	401.8	208.1	325.9
1985	363.5	481.8	333.8	286.5	303.9	151.7	132.6	147.0	232.3	234.6	428.6	227.8	277.0
1986	429.2	243.0	496.9	299.9	265.9	240.7	194.0	174.7	194.0	247.2	263.5	355.0	283.7
1987	384.0	327.7	358.7	346.7	160.4	230.2	176.4	175.4	181.5	302.3	315.0	289.1	270.6
1988	599.6	245.3	430.6	355.5	298.5	249.5	245.3	284.1	351.3	298.5	302.3	411.0	339.3
1989	373.2	278.0	293.9	294.3	271.9	223.9	194.9	189.8	236.0	319.1	321.4	442.3	286.6
1990	302.7	338.7	278.5	286.4	272.4	197.7	183.7	185.1	205.2	328.9	251.9	240.7	256.0
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	445.0	363.0	475.0	424.0	407.0	339.0	298.0	202.0	181.0	259.0	506.0	510.0	367.4
1993	440.0	274.0	299.0	262.0	486.0	238.0	218.0	155.0	260.0	307.0	494.0	417.0	320.8
Ave	433.7	297.8	383.4	402.5	339.0	241.5	202.7	179.6	209.3	262.5	373.3	397.3	310.2
Num													18

Collected Monthly Runoff													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1995	408.7	692.9	507.0	561.2	619.1	321.2	215.5	183.4	173.8	314.4	387.1	240.4	385.4
1996	266.1	546.9	428.4	621.7	331.5	266.8	351.3	416.1	342.9	392.7	233.0	229.2	368.9
1997	200.1	94.0	151.2	312.4	279.9	112.3	83.2	66.9	56.5	45.9	95.6	175.3	139.4
1998	376.8	239.9	220.2	259.7	194.5	133.4	100.0	188.4	299.0	252.4	157.0	146.5	214.0
1999	*	*	*	*	*	*	*	*	*	*	*	*	-
2000	*	*	*	*	*	*	*	*	*	*	*	*	-
2001	256.5	188.1	96.2	246.2	259.7	165.5	82.5	83.2	107.4	118.2	153.6	183.0	161.7
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	269.8	231.7	168.1	423.6	236.9	97.1	135.9	68.7	73.5	204.6	372.5	296.0	214.9
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	*	*	*	*	*	102.0	80.6	219.4	67.8	185.8	129.2	108.2	-
Ave	296.4	332.2	261.8	404.1	320.3	171.2	149.9	175.2	160.1	216.3	218.3	196.9	247.4
Num													6

Note: Hydrographs in 1999, 2000, and 2008 have irregular shapes and are judge as unreliable value.

Table 11 Supplemented Monthly Runoff and Collected Monthly Runoff Records (7/43)

No: 7 River Basin: Bt. Hari
 Station Name: Muara Inum River: Bt. Tembesi
 Station ID by HPPS2: 01-071-02-01 Catchment Area (km²): 1,455

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1973	132.0	157.1	160.1	225.1	135.0	188.2	75.8	77.9	82.7	122.2	105.4	87.4	129.1
1974	42.9	94.6	89.6	177.9	136.8	77.4	81.1	64.5	136.2	99.0	83.2	109.0	99.4
1975	96.3	129.8	96.5	171.7	88.2	41.9	60.3	67.4	129.7	63.0	79.1	45.8	89.1
1976	61.5	60.5	93.9	189.1	75.0	36.2	30.9	49.3	38.2	158.4	137.6	157.0	90.6
1977	177.0	155.9	171.6	171.0	167.3	99.7	71.3	47.2	38.1	33.8	91.9	54.2	106.6
1978	143.9	153.3	215.0	121.6	127.6	49.0	42.6	47.3	81.8	95.0	102.6	130.6	109.2
1979	261.4	192.0	111.3	128.5	91.8	92.9	85.5	73.3	112.2	85.6	163.8	143.5	128.5
1980	89.2	91.7	100.5	300.1	127.9	114.7	98.4	72.8	98.1	74.8	72.4	99.2	111.7
1981	69.2	127.9	183.3	154.5	97.3	80.0	91.1	70.3	113.1	91.7	89.4	88.6	104.7
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	184.2	128.9	73.8	91.3	71.9	72.4	127.0	58.4	100.0	100.3	95.6	103.9	100.6
1984	105.2	64.8	169.8	152.5	176.8	139.5	92.5	69.7	146.1	83.7	148.4	98.3	120.6
1985	132.7	157.5	161.5	101.2	85.0	73.6	47.5	39.1	77.0	92.9	170.9	87.5	102.2
1986	109.2	71.7	180.5	123.6	96.5	72.4	60.9	55.6	98.1	163.6	128.8	97.6	104.9
1987	84.5	69.0	82.2	91.8	115.0	76.7	71.8	62.9	57.3	68.7	93.4	87.4	80.0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
1990	161.0	102.0	116.0	138.0	124.0	81.6	117.0	43.2	66.3	94.2	129.0	205.0	114.8
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	219.0	190.0	133.0	152.0	79.7	68.8	86.2	47.3	73.9	94.8	202.0	446.0	149.4
1993	110.0	86.1	94.8	123.0	85.0	63.7	56.9	53.2	58.6	127.0	99.5	93.9	87.6
Ave	128.2	119.6	131.4	153.7	110.6	84.0	76.3	58.8	88.7	97.0	117.2	125.6	107.6
Num													17

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2006	201.8	127.8	114.8	115.6	125.5	116.6	105.3	-	-	-	-	-	-
Ave	201.8	127.8	114.8	115.6	125.5	116.6	105.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Num													0

Table 12 Supplemented Monthly Runoff and Collected Monthly Runoff Records (8/43)

No: 8 River Basin: A. Musi
 Station Name: Martapura River: A. Komer ing
 Station ID by HPPS2: 01-074-01-01 Catchment Area (km2): 4,260

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1960	351.9	215.5	265.7	272.7	182.8	102.1	91.5	213.9	69.0	89.9	228.5	398.9	206.9
1961	200.8	385.3	342.7	323.8	281.7	165.8	104.4	63.9	49.1	45.5	82.6	32.4	173.2
1962	209.4	295.7	441.4	313.8	225.5	156.4	168.7	145.3	111.4	162.7	185.3	285.3	225.1
1963	209.0	265.9	336.5	284.1	236.4	100.0	52.3	53.6	51.9	54.2	36.5	101.4	148.5
1964	288.5	288.2	282.5	373.5	119.7	97.4	80.5	79.1	47.6	86.2	100.7	249.1	174.4
1965	279.7	249.5	222.7	262.0	221.5	141.1	88.4	192.1	57.0	61.5	67.9	202.9	170.5
1966	196.8	119.7	319.5	123.7	294.3	211.0	131.9	139.9	103.5	56.4	239.7	255.6	182.7
1967	253.2	220.8	174.1	295.9	410.3	97.5	96.4	38.1	26.7	27.4	131.0	266.7	169.8
1968	283.2	164.7	286.7	336.3	244.3	194.6	178.8	228.6	157.4	159.0	147.8	306.0	224.0
1969	339.6	293.4	358.5	415.8	241.9	204.0	258.8	133.7	135.8	120.1	198.5	293.5	249.5
1970	334.9	282.5	448.6	317.2	294.4	215.5	124.7	176.9	151.0	129.8	207.8	199.5	240.2
1971	295.6	156.4	196.8	392.9	221.9	135.9	89.0	87.2	90.4	188.2	263.1	288.9	200.5
1972	333.1	318.8	312.3	410.3	449.1	196.7	83.0	61.1	48.2	31.9	63.9	188.0	208.0
1973	242.1	299.2	238.8	314.0	290.8	215.2	102.9	121.8	281.4	223.2	227.4	225.6	231.9
1974	105.0	66.3	111.2	280.1	155.8	49.0	84.5	165.9	250.7	294.8	240.4	232.4	169.7
1975	261.4	379.7	184.3	297.1	204.5	168.2	226.9	223.4	231.8	232.9	304.3	200.0	242.9
1976	308.8	290.1	372.3	437.8	288.4	181.6	144.6	161.4	141.4	372.4	359.6	380.9	286.6
1977	321.2	379.1	292.2	477.2	301.1	286.7	94.0	185.7	216.0	133.7	175.8	371.3	269.5
1978	348.7	313.3	498.7	334.7	402.0	196.4	248.0	119.2	151.1	324.5	324.8	424.2	307.1
1979	247.2	280.7	282.8	400.3	297.1	187.8	151.5	148.5	144.0	196.4	238.1	156.9	227.6
1980	314.4	205.0	330.3	402.9	164.3	132.1	171.8	263.2	168.6	222.9	604.0	442.2	285.1
1981	395.9	317.0	481.5	405.2	277.6	186.3	214.0	129.6	274.5	275.9	188.8	303.6	287.5
1982	397.7	604.8	343.3	293.8	226.8	169.3	184.9	79.2	59.4	83.2	67.7	249.1	229.9
1983	466.4	215.5	230.7	278.3	345.6	130.6	144.4	112.3	51.0	215.2	185.2	381.8	229.8
1984	225.0	281.1	546.0	417.9	243.6	183.9	167.3	238.5	208.3	190.4	306.5	388.3	283.1
Ave	288.4	275.5	316.0	338.5	264.9	164.2	139.3	142.5	131.1	159.1	207.0	273.0	225.0
Num													25

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1998	102.9	140.5	211.0	205.3	178.6	132.8	85.8	110.6	94.6	111.5	113.3	83.7	130.9
1999	411.8	311.0	172.5	308.2	317.7	159.4	133.4	92.7	85.3	132.6	373.9	330.1	235.7
Ave	257.4	225.7	191.8	256.8	248.1	146.1	109.6	101.7	89.9	122.0	243.6	206.9	183.3
Num													2

Table 13 Supplemented Monthly Runoff and Collected Monthly Runoff Records (9/43)

No: 9 River Basin: W. Tulang Bawang
 Station Name: Banjarmasin River: W. Besai
 Station ID by HPPS2: 01-077-02-07 Catchment Area (km2): 604

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	101.8	86.2	44.7	41.3	84.8	23.4	11.2	9.9	6.3	6.2	7.3	27.2	37.5
1973	38.1	40.0	47.0	52.9	36.5	34.6	34.6	15.9	12.5	36.2	23.0	36.3	34.0
1974	59.2	33.1	21.2	53.3	44.6	21.3	17.6	20.1	30.3	32.5	33.0	35.8	33.5
1975	60.7	59.7	36.3	48.6	27.7	19.3	17.4	18.3	16.1	26.7	49.1	22.9	33.6
1976	37.9	37.4	48.8	52.4	25.0	12.7	10.9	13.1	9.5	16.7	42.9	43.8	29.3
1977	71.6	80.8	64.7	73.1	23.1	40.1	17.1	8.0	9.8	6.0	16.3	51.8	38.5
1978	47.1	43.5	80.3	40.8	50.1	39.8	32.6	24.9	35.9	28.2	49.4	62.5	44.6
1979	27.4	69.3	46.0	58.4	49.9	35.5	32.2	20.8	20.4	20.4	30.3	44.9	38.0
1980	73.6	39.7	42.4	58.0	33.5	23.5	21.6	22.1	21.9	31.7	70.6	90.3	44.1
1981	49.0	39.9	102.6	76.8	57.7	34.7	29.6	30.4	33.5	25.1	30.1	31.6	45.1
1982	76.6	74.2	47.8	39.5	34.7	21.2	15.8	12.9	10.9	10.6	9.7	32.6	32.2
1983	147.7	44.9	68.0	64.1	68.3	29.1	21.6	16.2	12.1	13.2	34.0	33.9	46.1
1984	43.2	28.0	61.7	54.1	60.4	31.1	19.3	27.7	38.9	48.1	36.4	44.0	41.1
1985	61.6	34.2	50.3	48.0	28.1	34.2	33.1	31.9	32.6	27.4	29.2	27.9	36.5
1986	51.0	46.9	78.5	51.3	42.5	26.8	25.4	21.4	33.3	41.7	49.9	55.0	43.6
1987	62.4	46.7	59.3	64.3	30.9	14.8	8.1	7.7	6.6	7.1	16.1	39.0	30.2
1988	40.3	26.9	15.0	31.9	33.7	21.1	18.0	21.1	13.5	19.0	36.8	35.8	26.1
1989	57.7	56.5	51.0	47.8	34.6	41.6	28.2	23.6	19.3	21.4	32.7	44.6	38.3
1990	35.8	49.0	41.1	33.7	30.3	26.3	16.2	20.8	15.1	7.3	8.6	43.0	27.3
1991	36.4	28.6	33.9	50.6	45.9	19.6	12.8	8.6	8.2	7.2	24.4	52.0	27.3
1992	39.4	60.6	73.1	45.4	49.3	21.9	18.3	17.8	20.7	24.3	57.5	67.4	41.3
1993	84.1	51.9	62.9	53.9	47.5	31.6	27.7	29.7	16.6	13.3	31.0	59.5	42.5
Ave	59.2	49.0	53.5	51.8	42.7	27.5	21.3	19.2	19.3	21.4	32.7	44.6	36.8
Num													22

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1995	42.7	75.5	51.1	55.9	44.4	28.1	18.9	24.0	27.7	26.5	33.5	24.6	37.7
1996	32.7	48.8	52.0	44.8	25.1	19.1	18.9	17.3	20.8	28.4	79.1	50.5	36.5
1997	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	48.5	50.0	66.5	57.6	53.2	42.9	34.3	27.3	29.2	35.0	32.4	29.0	42.2
1999	43.4	33.8	40.2	34.4	38.0	30.9	27.4	24.7	22.7	25.4	22.4	28.3	31.0
2000	38.8	38.9	18.7	25.7	32.1	27.5	33.4	39.1	62.0	78.6	137.1	153.3	57.1
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	101.2	54.6	38.0	29.8	34.2	21.1	11.9	8.6	9.3	22.1	37.2	68.1	36.4
Ave	51.2	50.3	44.4	41.4	37.8	28.3	24.1	23.5	28.6	36.0	56.9	59.0	40.1
Num													6

Table 14 Supplemented Monthly Runoff and Collected Monthly Runoff Records (10/43)

No: 10 River Basin: W. Sekampung
 Station Name: Kunyir River: W. Sekampung
 Station ID by HPPS2: 01-080-01-04 Catchment Area (km2): 438

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1968	31.0	24.8	30.6	33.6	35.8	27.1	28.9	40.5	26.6	21.9	22.3	25.5	29.0
1969	28.6	33.7	31.1	34.6	23.6	22.3	22.5	15.6	17.2	14.8	20.7	19.9	23.7
1970	38.3	39.3	49.8	39.6	35.1	31.9	24.6	20.3	16.9	18.0	23.4	23.6	30.1
1971	30.6	22.7	24.1	26.5	20.2	15.7	14.5	12.1	14.9	17.1	30.9	33.9	21.9
1972	35.9	28.7	25.0	27.2	30.1	20.4	12.2	11.7	9.1	7.0	8.4	13.3	19.1
1973	21.6	22.1	30.8	24.8	30.5	22.4	15.0	15.3	24.2	18.8	18.6	29.6	22.8
1974	17.2	22.0	15.4	20.8	18.5	13.0	12.4	13.6	16.4	13.7	15.5	19.3	16.5
1975	28.4	31.2	21.4	31.0	22.2	15.1	13.8	14.1	12.3	14.8	17.8	13.6	19.6
1976	19.8	31.6	25.5	24.1	15.2	10.2	13.6	11.8	7.3	14.7	14.4	15.4	17.0
1977	26.0	38.1	27.1	39.6	23.4	27.9	19.7	13.3	13.1	11.8	10.4	26.2	23.1
1978	26.6	35.8	52.2	32.2	35.0	32.9	27.2	14.4	18.2	17.9	28.3	47.5	30.7
1979	33.4	47.4	34.1	35.6	34.0	24.8	39.6	23.9	20.4	15.0	13.9	16.3	28.2
1980	36.2	25.9	22.9	25.5	21.4	17.4	14.5	19.3	24.3	18.4	38.2	45.1	25.8
1981	31.7	30.2	42.3	44.9	44.6	26.9	18.4	13.8	24.0	16.8	16.2	21.7	27.6
1982	42.0	43.7	32.4	25.0	18.4	12.7	11.3	8.1	6.6	5.5	5.5	16.7	19.0
1983	36.2	27.0	28.6	28.9	30.4	18.8	14.0	9.9	7.2	6.6	13.1	13.9	19.6
1984	22.0	17.2	31.9	27.4	19.9	21.0	13.3	12.9	18.5	25.2	20.6	27.9	21.5
1985	37.2	75.3	33.6	37.3	27.8	19.6	20.3	17.2	16.0	17.5	14.9	15.8	27.7
1986	25.9	25.1	35.0	28.9	23.5	23.9	23.5	17.5	23.0	21.7	32.1	37.0	26.4
1987	45.6	43.3	32.1	35.4	29.2	28.2	15.8	12.3	12.5	10.9	15.5	21.5	25.2
1988	42.4	34.4	41.7	22.9	20.2	15.5	14.2	13.5	8.8	9.0	21.2	18.0	21.8
1989	36.1	42.5	31.8	23.2	17.6	15.8	3.0	4.3	13.9	9.2	5.7	13.7	18.1
1990	24.0	36.1	24.2	19.9	19.0	15.0	12.0	8.8	8.2	3.7	5.1	19.8	16.3
1991	26.5	18.6	29.4	26.1	35.4	16.3	9.7	7.6	5.6	3.5	12.6	22.8	17.8
1992	18.4	28.8	62.2	39.2	24.4	13.7	12.3	11.5	11.6	12.7	20.2	28.4	23.6
1993	38.7	33.5	36.2	34.1	27.0	25.2	32.8	27.3	15.5	11.3	14.7	48.4	28.7
Ave	30.8	33.0	32.7	30.3	26.2	20.5	17.7	15.0	15.1	13.7	17.7	24.4	23.1
Num													26

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	49.4	47.3	43.1	32.4	22.2	13.2	9.2	7.7	7.0	6.0	6.7	12.6	21.4
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	22.1	36.5	32.8	27.9	16.1	12.5	10.5	8.8	8.7	8.2	8.5	8.0	16.7
1997	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	12.3	17.3	28.0	30.3	27.8	18.7	13.6	14.2	11.5	11.9	13.6	12.2	17.6
1999	18.1	15.7	18.2	9.7	11.3	8.6	12.1	8.7	7.6	16.2	19.3	20.6	13.8
2000	21.6	21.8	19.3	19.2	12.3	10.8	14.6	10.2	8.8	10.3	18.1	*	-
2001	*	9.3	7.4	9.3	7.8	7.3	6.2	5.0	5.2	7.3	6.2	7.3	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	*	*	*	*	*	*	*	*	*	*	*	*	-
2006	*	*	*	*	*	*	*	*	*	*	*	*	-
2007	*	*	*	*	*	*	*	*	*	*	*	*	-
Ave	24.7	24.7	24.8	21.5	16.2	11.8	11.1	9.1	8.1	10.0	12.1	12.1	17.4
Num													4

Note: Hydrographs after 2000 have irregular shapes and are judge as unreliable value.

Table 15 Supplemented Monthly Runoff and Collected Monthly Runoff Records (11/43)

No: 11 River Basin: Kr. Aceh
 Station Name: Kp. Darang River: Kr. Aceh
 Station ID by HPPS2: 01-001-01-01 Catchment Area (km²): 1,081

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1977	40.9	33.5	23.9	28.5	35.2	18.8	9.5	8.1	12.0	45.2	85.1	73.1	34.5
1978	55.8	41.1	48.5	72.6	87.2	18.8	17.4	13.0	18.8	33.9	47.1	54.2	42.4
1979	22.1	22.6	20.9	25.2	25.7	34.0	29.4	21.6	36.0	21.4	37.7	33.9	27.5
1980	23.1	19.3	37.8	47.2	38.0	30.9	15.0	8.1	23.0	63.1	52.5	75.0	36.1
1981	37.0	27.9	24.0	44.3	67.3	22.4	9.9	13.0	36.7	33.8	23.6	15.1	29.6
1982	12.1	16.8	35.2	54.1	40.9	31.1	13.7	10.0	9.4	28.4	101.0	48.2	33.4
1983	37.4	35.1	50.3	32.1	64.6	37.3	14.3	10.7	23.9	31.5	33.4	135.7	42.2
1984	58.3	58.6	65.3	44.2	29.1	16.0	18.8	6.1	5.9	5.8	12.5	50.6	30.9
1985	28.0	60.1	47.4	46.5	47.3	17.5	8.4	7.2	7.2	24.2	48.4	43.7	32.2
1986	49.7	19.0	32.3	53.2	70.7	28.1	13.1	11.5	22.4	23.4	29.0	60.1	34.4
1987	29.9	28.6	44.4	41.8	80.2	37.0	17.2	24.5	20.4	62.8	79.6	76.2	45.2
1988	35.3	52.9	14.2	31.6	48.3	23.9	15.0	13.0	18.8	33.9	47.1	54.2	32.4
1989	21.6	19.6	45.0	39.6	22.9	15.3	27.4	17.1	26.9	32.7	32.3	22.7	26.9
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	33.5	22.6	31.9	38.8	38.5	22.5	15.7	17.8	15.1	43.9	49.0	33.2	30.2
1992	33.5	16.9	18.0	31.4	33.2	21.0	18.3	19.0	19.5	20.1	22.5	28.8	23.5
1993	24.9	29.7	34.3	35.0	31.0	17.7	16.9	15.2	21.5	27.7	47.2	41.2	28.5
Ave	33.9	31.5	35.8	41.6	47.5	24.5	16.2	13.5	19.8	33.2	46.8	52.9	33.1
Num													16

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	17.7	37.1	27.5	23.2	18.1	14.0	12.3	15.5	12.9	51.2	55.0	26.7	25.9
1995	31.4	32.5	67.3	46.5	55.9	28.8	20.2	27.7	25.3	24.9	26.9	30.7	34.9
1996	27.1	45.1	29.4	59.7	32.8	38.2	48.1	22.0	19.4	11.1	18.4	39.9	32.6
1997	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	*	*	*	*	*	*	*	*	*	*	*	*	-
Ave	25.4	38.2	41.4	43.1	35.6	27.0	26.9	21.7	19.2	29.1	33.4	32.4	31.1
Num													3

Note: Hydrograph in 2008 has irregular shape and is judge as unreliable value.

Table 16 Supplemented Monthly Runoff and Collected Monthly Runoff Records (12/43)

No: 12 River Basin: Kr. Teunom
 Station Name: Tui Kareng River: Kr. Teunom
 Station ID by HPPS2: 01-205-01-01 Catchment Area (km²): 2,403

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1982	71.8	117.8	125.9	81.2	254.3	125.4	160.4	73.2	117.2	182.3	361.9	229.4	158.4
1983	113.5	80.9	215.0	115.7	332.5	122.1	97.1	94.7	230.4	198.3	209.3	258.0	172.3
1984	271.5	203.8	250.9	255.7	186.0	137.3	131.6	76.6	89.7	390.6	175.0	162.1	194.2
1985	151.0	174.0	261.0	211.0	238.0	130.0	71.8	79.7	88.8	205.0	266.0	238.0	176.2
1986	137.0	71.6	198.0	386.0	402.0	206.0	87.6	107.0	222.0	230.0	228.0	194.0	205.8
1987	377.9	89.5	173.0	185.0	173.0	102.0	72.2	353.0	128.0	244.0	225.0	378.0	208.4
1988	237.0	316.0	214.0	168.0	383.0	90.3	71.9	103.0	222.0	139.0	202.0	195.0	195.1
1989	134.0	118.0	318.0	275.0	144.0	84.1	179.0	98.4	175.0	218.0	218.0	142.0	175.3
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	227.0	142.0	215.0	269.0	267.0	141.0	87.6	104.0	82.6	309.0	350.0	225.0	201.6
1992	227.0	97.6	107.0	202.0	219.0	120.0	110.0	114.0	119.0	122.0	140.0	190.0	147.3
1993	160.0	197.0	234.0	239.0	208.0	103.0	96.4	83.6	133.0	182.0	335.0	288.0	188.3
Ave	191.6	146.2	210.2	217.1	255.2	123.7	106.0	117.0	146.2	220.0	246.4	227.2	183.9
Num													11

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	222.5	332.3	309.7	347.2	234.1	148.4	72.6	119.5	93.2	321.3	395.6	275.2	239.3
1995	149.2	102.1	330.9	308.2	262.9	169.2	271.4	220.3	192.7	194.9	292.9	210.2	225.4
1996	111.0	245.1	149.1	213.1	158.6	185.6	128.8	88.1	127.9	260.0	209.5	204.2	173.4
Ave	160.9	226.5	263.2	289.5	218.5	167.7	157.6	142.6	137.9	258.7	299.3	229.9	212.7
Num													3

Table 17 Supplemented Monthly Runoff and Collected Monthly Runoff Records (13/43)

No: 13 River Basin: Bt. Toru
 Station Name: Hapesong Baru River: Bt. Toru
 Station ID by HPPS2: 01-178-01-01 Catchment Area (km2): 2,773

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	114.1	119.5	114.1	163.8	169.2	136.3	102.7	114.1	144.7	151.6	218.8	157.7	142.2
1973	167.4	126.6	144.7	175.6	178.8	179.6	102.4	100.2	148.7	123.1	120.5	143.0	142.6
1974	137.6	148.3	131.5	163.2	132.5	111.1	102.0	91.2	118.3	116.8	99.4	148.3	125.0
1975	147.9	167.4	140.0	132.9	104.8	95.7	104.4	92.2	107.9	92.0	100.2	98.0	115.3
1976	127.4	130.0	149.5	167.0	111.3	114.6	93.3	98.1	88.2	123.3	156.2	163.4	126.8
1977	179.8	159.7	149.6	169.6	148.9	132.0	93.2	84.3	117.3	179.6	249.3	197.5	155.1
1978	97.1	162.8	151.3	187.2	165.5	98.6	84.5	71.0	79.0	132.2	200.0	155.7	132.1
1979	147.5	130.0	126.2	111.5	102.4	103.2	94.5	87.8	123.9	114.6	162.1	163.2	122.2
1980	150.0	97.3	134.8	135.1	118.6	123.3	64.5	76.4	101.0	106.1	168.5	171.9	120.6
1981	151.3	151.3	105.4	158.7	201.6	141.2	93.9	93.2	130.7	125.3	114.8	120.6	132.3
1982	102.9	143.0	193.7	219.1	188.2	97.9	80.3	84.9	113.5	120.8	151.4	141.2	136.4
1983	134.4	110.9	111.7	109.2	119.8	99.1	82.8	81.1	137.3	127.7	99.1	175.7	115.7
1984	159.1	164.0	163.0	189.0	142.0	106.0	108.0	100.8	109.0	119.0	186.8	166.0	142.7
1985	138.0	131.0	149.2	167.0	144.0	77.5	68.5	87.1	95.5	109.0	157.0	180.0	125.3
1986	162.0	97.5	144.0	186.0	144.0	102.0	83.2	65.0	95.2	106.0	133.0	107.0	118.7
1987	132.7	129.4	130.4	132.5	107.1	102.6	90.5	111.7	101.9	106.5	156.9	160.8	121.9
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	89.5	110.0	130.0	152.0	112.0	81.9	79.4	94.8	91.5	172.0	257.0	172.0	128.5
1990	137.0	85.0	110.0	118.0	133.0	71.7	86.5	88.6	91.6	114.0	137.0	193.0	113.8
1991	131.5	117.9	148.8	155.5	165.2	128.7	105.1	104.7	105.5	108.4	142.5	276.0	140.8
1992	163.0	110.0	93.8	134.0	116.0	60.7	67.0	72.5	82.6	84.1	222.0	197.0	116.9
1993	121.6	95.9	103.0	158.4	189.8	98.6	124.6	95.9	127.7	114.5	198.9	163.1	132.7
Ave	137.7	128.0	134.5	156.5	142.6	107.7	91.0	90.3	110.0	121.3	163.4	164.3	128.9
Num													21

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	*	*	*	*	*	*	*	*	*	*	*	*	-
1995	*	*	*	*	*	*	*	*	*	*	*	*	-
1996	90.8	112.7	95.0	138.1	62.2	75.8	75.9	81.6	37.4	81.8	55.8	83.5	82.6
1997	71.3	59.1	97.6	61.9	62.8	50.0	48.1	39.7	34.7	47.0	74.8	57.3	58.7
1998	67.5	36.5	44.0	33.0	41.8	32.8	34.5	123.3	131.1	61.8	117.2	170.5	74.5
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	98.4	100.8	78.3	117.9	79.5	83.8	86.7	99.5	75.8	125.1	177.6	172.3	108.0
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	87.4	30.6	52.5	88.2	46.8	49.8	56.1	-	-	108.4	48.3	73.3	-
2008	221.7	117.2	133.3	173.7	100.3	127.1	45.0	55.5	61.1	-	-	-	-
Ave	106.2	76.2	83.4	102.1	65.6	69.9	57.7	79.9	68.0	84.8	94.8	111.4	80.9
Num													4

Note: Maximum and average runoff in 1994 and 1995 are much lower than others and judged as unreliable value.

Table 18 Supplemented Monthly Runoff and Collected Monthly Runoff Records (14/43)

No: 14 River Basin: Bt. Indrapura
 Station Name: Air Batu River: Bt. Indrapura
 Station ID by HPPS2: 01-141-01-01 Catchment Area (km2): 468

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1973	33.2	26.1	26.2	56.4	39.1	33.9	18.9	43.1	18.2	27.2	32.2	28.6	31.9
1974	15.5	18.0	10.2	39.0	41.3	22.8	30.0	18.2	41.3	43.1	30.4	42.5	29.4
1975	24.3	33.0	26.6	26.3	27.9	22.4	15.7	15.4	16.7	14.3	30.6	10.9	22.0
1976	18.1	15.3	20.4	27.9	35.2	23.4	18.3	17.1	20.0	43.3	45.9	40.0	27.1
1977	40.4	32.1	31.3	41.5	46.3	22.4	15.7	15.4	16.7	14.3	30.6	10.9	26.5
1978	38.2	22.7	46.2	40.3	35.6	21.0	26.5	21.4	29.0	32.9	38.4	58.8	34.3
1979	40.4	41.1	32.0	40.3	28.7	28.0	35.7	23.9	36.3	30.6	62.6	32.2	36.0
1980	28.7	20.4	28.6	48.1	38.8	37.4	19.3	18.9	21.8	30.3	45.6	35.9	31.2
1981	30.7	36.2	43.7	41.0	42.1	24.1	21.7	13.9	33.9	53.6	28.8	33.5	33.6
1982	37.3	66.9	60.1	55.6	58.4	36.4	19.4	13.8	13.6	24.6	38.7	73.3	41.5
1983	57.4	37.0	45.8	50.9	39.8	23.4	18.2	17.6	30.8	34.7	33.4	53.3	36.9
1984	39.9	21.5	45.3	39.5	38.4	26.2	19.4	25.7	37.5	27.0	34.1	31.7	32.2
1985	44.2	47.7	30.8	21.3	34.7	18.1	13.7	20.5	30.3	28.8	36.9	23.9	29.2
1986	27.2	10.5	35.5	30.6	25.7	13.5	16.3	11.9	10.4	25.1	23.2	30.7	21.7
1987	51.0	20.8	18.1	24.3	25.6	9.3	8.1	4.9	6.7	27.5	26.2	23.7	20.5
1988	60.9	35.4	12.7	16.4	8.8	7.5	7.6	13.2	20.7	16.2	56.7	17.5	22.8
1989	36.7	28.3	29.7	29.8	27.8	23.5	21.0	20.5	24.6	32.8	26.0	25.0	27.1
1990	30.5	33.7	28.4	29.1	27.8	21.2	20.0	20.1	28.7	32.8	26.0	25.0	26.9
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	49.3	46.9	37.1	36.9	33.2	30.4	15.0	35.3	37.9	42.7	42.3	57.5	38.7
1993	83.4	46.2	64.3	72.5	77.3	38.8	41.1	43.2	42.9	48.0	52.1	61.4	55.9
Ave	39.4	32.0	33.7	38.4	36.6	24.2	20.1	20.7	25.9	31.5	37.0	35.8	31.3
Num													20

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1995	58.4	50.9	32.9	43.2	72.8	37.8	44.5	35.7	56.2	60.2	58.3	63.1	51.1
1996	51.3	48.7	45.4	53.0	38.3	43.3	33.7	39.3	33.2	54.3	42.5	60.6	45.3
1997	50.1	35.1	16.4	40.1	63.5	36.1	35.7	30.3	30.8	28.9	29.1	29.0	35.4
1998	41.3	43.9	47.1	44.8	42.1	28.3	24.3	32.7	44.5	40.6	38.2	48.2	39.7
1999	54.2	47.4	69.1	29.4	30.0	29.0	30.9	27.9	38.1	43.2	67.0	39.5	42.1
2000	51.1	33.3	21.2	30.8	26.9	24.8	29.2	30.8	33.4	32.3	69.5	53.3	36.4
2001	*	*	*	*	*	*	*	*	*	*	*	*	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	*	*	*	*	*	*	*	*	*	*	*	*	-
Ave	51.0	43.2	38.7	40.2	45.6	33.2	33.1	32.8	39.4	43.2	50.8	48.9	41.7
Num													6

Note: Hydrographs after 2001 have irregular shape and are judge as unreliable value.

Table 19 Supplemented Monthly Runoff and Collected Monthly Runoff Records (15/43)

No: 15 River Basin: Bt. Pasaman
 Station Name: Air Gadang River: Bt. Pasaman
 Station ID by HPPS2: 01-165-01-01 Catchment Area (km²): 1,339

Supplemented Monthly Runoff in HPPS2													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1973	106.8	92.0	114.1	188.4	144.2	108.5	75.4	128.5	143.4	128.5	111.9	131.1	122.7
1974	63.1	78.4	72.8	117.9	113.6	82.2	58.0	88.6	182.5	126.8	166.3	4.0	96.2
1975	90.3	57.0	93.0	154.9	74.9	70.3	91.7	69.5	167.6	79.8	120.0	168.1	103.1
1976	125.0	76.8	116.0	159.3	76.7	110.1	111.0	106.1	89.9	273.2	301.6	138.3	140.3
1977	130.2	130.0	100.1	107.6	92.5	90.4	63.0	83.4	126.4	167.5	292.9	128.7	126.1
1978	108.7	121.3	163.2	207.1	163.4	130.6	120.7	84.2	80.0	154.0	213.5	121.9	139.1
1979	93.5	72.3	81.1	140.6	88.3	117.0	106.2	93.4	231.4	155.0	300.4	174.1	137.8
1980	78.0	52.0	136.0	212.8	239.8	107.9	72.0	78.6	76.6	216.0	165.0	212.0	137.2
1981	116.0	112.0	58.7	114.0	175.2	85.5	86.7	50.4	175.0	210.4	118.1	51.2	112.8
1982	44.9	98.9	62.3	154.4	152.1	70.7	60.2	57.9	85.9	118.3	143.4	130.5	98.3
1983	76.4	36.6	97.0	149.1	169.4	113.5	85.6	95.1	128.0	142.8	121.6	169.4	115.4
1984	70.3	84.9	116.0	280.2	149.6	94.6	112.3	83.8	142.8	157.6	179.3	154.3	135.5
1985	113.6	135.7	146.8	141.3	137.4	88.6	92.8	100.0	128.9	114.5	162.5	121.7	123.7
1986	63.5	47.2	143.0	192.0	120.1	93.7	85.6	88.0	163.0	180.0	182.0	75.2	119.4
1987	67.3	93.7	145.5	177.4	188.9	103.0	100.0	141.3	147.6	224.1	182.2	131.1	141.8
1988	143.8	140.4	143.0	153.6	146.4	110.2	125.5	91.2	136.7	155.7	183.2	151.5	140.1
1989	85.2	108.5	108.1	118.3	107.7	63.9	98.3	126.4	191.0	192.3	248.4	126.8	131.2
1990	86.0	73.3	85.2	131.1	165.1	123.4	173.1	150.6	167.2	150.0	206.2	127.2	136.5
1991	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	49.0	43.5	68.0	83.6	98.2	92.5	70.1	59.6	94.7	90.4	121.0	98.1	80.7
1993	94.1	63.0	136.0	84.1	89.7	67.7	59.8	46.5	75.5	77.7	125.0	137.0	88.0
Ave	90.3	85.9	109.3	153.4	134.7	96.2	92.4	91.2	136.7	155.7	182.2	127.6	121.3
Num													20

Collected Monthly Runoff													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1996	106.5	85.4	133.7	171.3	74.3	113.5	108.1	157.2	78.0	132.0	139.2	90.0	115.8
1997	64.9	45.7	56.0	68.4	84.5	65.2	77.1	59.4	67.4	58.1	197.9	67.6	76.0
1998	94.5	84.2	73.4	79.3	68.4	70.9	74.8	140.9	93.3	107.7	123.3	142.2	96.1
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	72.7	51.1	57.5	81.3	71.2	109.8	108.9	144.2	125.7	111.4	171.7	126.0	102.6
2001	106.1	113.0	97.2	128.7	112.5	95.4	90.3	89.7	136.1	120.3	121.3	109.0	110.0
Ave	88.9	75.9	83.6	105.8	82.2	91.0	91.9	118.3	100.1	105.9	150.7	107.0	100.1
Num													5

Table 20 Supplemented Monthly Runoff and Collected Monthly Runoff Records (16/43)

No: 16 River Basin: A. Musi
 Station Name: Despetah River: A. Musi
 Station ID by HPPS2: 01-074-01-02 Catchment Area (km2): 627

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1974	33.8	48.3	31.3	37.3	47.1	31.7	26.4	23.3	49.7	44.7	55.9	69.7	41.6
1975	65.5	59.6	48.3	62.7	47.6	24.6	33.5	29.7	32.2	32.9	39.8	36.7	42.7
1976	62.5	52.7	75.0	68.0	44.0	26.7	26.3	26.1	25.4	70.2	56.6	54.2	49.0
1977	99.4	79.1	63.5	48.7	45.2	43.0	34.4	27.2	26.3	18.3	34.9	67.7	49.0
1978	53.0	43.0	61.4	45.7	66.4	32.5	30.6	24.5	30.0	54.7	59.6	88.7	49.2
1979	89.2	56.8	52.7	56.8	44.9	35.7	30.1	33.7	42.7	40.7	62.3	57.4	50.2
1980	63.4	43.8	67.9	77.7	47.8	36.2	28.6	34.8	39.2	48.7	82.5	76.0	53.9
1981	52.5	66.3	54.7	67.8	56.4	33.7	37.9	28.3	42.5	60.7	45.9	33.4	48.3
1982	53.7	68.0	61.4	54.9	43.1	32.9	20.4	18.5	16.3	15.6	14.8	36.0	36.3
1983	67.4	38.7	34.1	39.5	38.4	33.7	25.1	20.9	21.5	29.8	48.6	46.8	37.0
1984	62.9	39.9	77.1	78.4	75.0	44.4	38.0	31.8	38.2	48.5	38.0	48.0	51.7
1985	43.4	45.9	53.9	39.7	38.6	27.2	30.4	26.1	27.6	25.8	45.6	38.7	36.9
1986	37.6	43.8	68.0	66.2	32.9	27.0	26.1	27.0	39.3	55.4	50.4	50.3	43.7
1987	83.8	58.2	49.9	66.5	77.9	37.9	24.9	19.7	19.9	28.3	48.4	58.2	47.8
1988	77.4	54.2	50.4	50.7	37.8	30.0	22.9	25.0	40.7	36.4	63.5	65.4	46.2
1989	84.8	70.6	48.2	58.8	39.8	31.0	21.5	20.0	31.3	45.3	66.7	73.5	49.3
1990	58.9	41.7	39.3	42.8	44.5	29.3	33.0	27.1	33.6	28.5	47.1	68.8	41.2
1991	92.5	73.4	58.6	46.8	28.3	18.0	14.9	26.7	14.2	13.0	28.2	61.9	39.7
Ave	65.6	54.7	55.3	56.0	47.5	32.0	28.0	26.1	31.7	38.7	49.4	57.3	45.2
Num													18

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 21 Supplemented Monthly Runoff and Collected Monthly Runoff Records (17/43)

No: 17 River Basin: S. Kapuas
 Station Name: Silat damsite River: S. Silat
 Station ID by HPPS2: - Catchment Area (km²): 1,312

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1979	60.3	84.7	32.9	105.2	131.0	78.0	85.4	26.0	121.7	34.8	124.4	107.1	82.6
1980	129.8	80.0	82.7	135.1	80.0	59.4	20.3	48.1	35.7	90.6	116.3	84.1	80.2
1981	55.3	39.7	59.9	53.8	85.9	34.1	35.0	14.4	101.5	11.8	103.4	83.2	56.5
1982	108.4	71.6	74.8	102.4	97.7	60.5	13.4	7.2	9.5	23.3	51.4	72.4	57.7
1983	190.9	78.0	15.9	37.4	42.7	41.2	58.6	47.6	72.8	44.6	104.1	129.5	71.9
1984	165.5	78.3	19.5	87.8	60.3	34.9	99.1	30.0	172.0	79.9	82.9	95.1	83.8
1985	91.0	47.4	73.5	157.3	135.0	60.7	17.8	22.1	62.2	35.2	67.7	112.8	73.6
1986	98.6	72.7	59.7	60.6	83.1	45.5	10.3	41.4	103.6	89.0	113.3	83.4	71.8
1987	122.5	86.8	12.2	46.4	107.8	56.2	26.7	22.4	19.3	56.6	93.9	62.9	59.5
1988	402.8	89.7	82.5	92.3	61.2	52.2	33.5	8.3	46.9	105.5	151.2	103.3	102.5
1989	66.8	53.4	94.9	65.1	58.6	70.1	26.6	29.3	128.7	37.0	92.1	84.8	67.3
1990	59.5	78.0	49.9	121.8	99.4	41.4	37.2	41.6	28.2	35.1	128.8	101.0	68.5
1991	88.8	81.9	18.0	74.1	68.5	27.2	147.5	39.8	204.7	56.4	76.7	100.2	82.0
1992	114.0	45.6	73.6	154.0	141.1	57.9	19.2	11.1	97.4	31.6	61.8	110.6	76.5
1993	91.4	93.2	45.6	54.7	76.8	46.4	13.4	21.6	137.5	92.3	105.0	80.5	71.5
Ave	123.0	72.1	53.0	89.9	88.6	51.0	42.9	27.4	89.4	54.9	98.2	94.1	73.7
Num													15

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 22 Supplemented Monthly Runoff and Collected Monthly Runoff Records (18/43)

No: 18 River Basin: S. Berau
 Station Name: Kelai-2 damsite River: S. Kelai
 Station ID by HPPS2: - Catchment Area (km2): 4,590

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1977	220.4	201.4	201.9	258.3	156.7	123.4	86.2	131.6	127.2	315.7	324.5	577.0	227.0
1978	409.1	380.6	466.3	497.9	372.4	281.9	286.1	308.6	280.9	303.6	258.2	261.3	342.2
1979	276.8	261.3	365.3	502.4	472.1	366.0	291.6	259.1	256.2	197.7	310.5	204.6	313.6
1980	179.8	216.6	568.0	717.8	410.2	223.2	141.0	108.5	121.1	109.0	204.2	294.2	274.5
1981	306.2	202.3	133.3	161.0	197.7	180.6	230.5	264.0	380.0	383.7	476.0	380.3	274.6
1982	560.5	433.4	584.3	414.2	415.7	319.2	260.6	170.7	96.7	85.6	71.6	97.7	292.5
1983	207.2	161.5	119.7	74.8	259.4	274.2	842.1	472.3	315.7	217.5	142.6	370.8	288.2
1984	378.6	1,069.4	749.4	700.2	515.6	461.4	370.6	407.7	245.3	310.5	276.7	310.9	483.0
1985	425.2	533.1	411.6	333.9	340.0	269.4	182.9	155.3	160.3	252.9	365.1	347.1	314.7
1986	692.7	587.4	583.3	614.1	462.0	294.4	249.2	208.4	132.6	88.3	173.1	199.9	357.1
1987	408.7	351.9	495.2	359.6	347.4	294.1	306.0	259.2	168.6	217.4	280.0	281.4	314.1
1988	275.8	360.0	477.2	477.8	458.2	350.8	299.8	299.2	220.9	277.1	281.8	333.5	342.7
1989	423.7	301.1	249.5	155.8	126.9	150.3	155.8	123.9	115.9	257.4	327.5	361.3	229.1
1990	230.8	236.7	178.2	211.0	219.5	403.2	419.4	324.2	289.8	191.8	367.9	360.1	286.1
1991	542.3	343.9	264.0	214.1	218.2	247.1	168.9	167.1	164.2	188.9	148.6	176.5	237.0
1992	160.5	191.7	127.0	77.8	58.2	117.2	101.1	78.5	185.0	195.2	75.0	95.6	121.9
Ave	356.1	364.5	373.4	360.7	314.4	272.3	274.5	233.6	203.8	224.5	255.2	290.8	293.6
Num													16

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 23 Supplemented Monthly Runoff and Collected Monthly Runoff Records (19/43)

No: 19 River Basin: S. Martapura
 Station Name: Sei Langsat (Riam Kiwa damsite) River: S. Riam Kiwa
 Station ID by HPPS2: 03-026-01-01 Catchment Area (km²): 1,420

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1965	73.6	62.0	87.3	77.2	138.0	21.6	14.7	6.3	1.9	2.2	11.4	41.9	44.8
1966	55.6	119.4	90.2	90.6	80.9	46.4	31.6	30.5	28.8	19.0	30.5	150.6	64.5
1967	59.2	81.3	66.9	102.8	111.1	125.9	119.1	28.7	14.3	12.1	30.7	55.8	67.3
1968	131.1	86.5	148.6	150.8	91.3	62.7	64.9	101.9	45.2	21.8	43.2	70.4	84.9
1969	80.1	118.3	129.2	149.6	69.1	57.1	27.9	36.6	15.4	7.2	10.5	48.6	62.5
1970	72.1	121.4	123.2	89.8	90.7	83.0	88.7	49.0	35.4	38.2	49.4	126.8	80.6
1971	110.7	74.1	77.8	60.8	29.2	25.8	14.0	39.2	110.2	64.6	118.3	108.3	69.4
1972	95.5	88.9	126.9	128.5	91.8	33.0	32.2	4.9	5.0	2.3	5.8	23.9	53.2
1973	72.9	113.6	105.1	161.4	151.0	73.0	72.6	57.8	57.5	19.0	65.3	74.3	85.3
1974	34.8	138.9	84.7	53.6	23.8	9.1	34.1	4.2	42.2	38.8	74.4	87.7	52.2
1975	103.0	77.7	135.6	65.8	47.7	30.1	38.9	32.2	55.8	41.0	58.9	96.6	65.3
1976	128.2	69.9	63.4	39.0	15.6	12.4	6.0	2.7	2.4	8.1	32.6	74.9	37.9
1977	98.0	109.4	162.9	104.8	58.6	44.2	15.2	9.3	5.0	3.2	6.2	20.3	53.1
1978	58.8	73.0	124.5	75.5	80.3	40.4	26.7	21.0	21.8	24.4	26.8	79.6	54.4
1979	115.1	122.0	70.5	145.5	51.7	56.9	20.6	12.0	10.7	5.3	19.4	61.7	57.6
1980	107.5	65.7	60.5	123.1	62.9	70.0	21.0	9.7	5.6	12.1	24.4	82.9	53.8
1981	80.2	62.7	94.3	105.9	90.0	23.1	41.2	12.5	8.5	10.5	34.7	91.8	54.6
1982	149.0	115.5	115.0	90.4	53.9	28.9	8.5	3.4	0.4	1.3	5.2	21.5	49.4
1983	60.5	40.8	27.3	27.8	80.2	37.4	23.3	8.1	5.2	6.2	69.4	74.2	38.4
1984	84.9	89.0	150.0	135.5	134.5	86.3	57.6	18.2	25.2	12.7	22.2	100.2	76.4
Ave	88.5	91.5	102.2	98.9	77.6	48.4	37.9	24.4	24.8	17.5	37.0	74.6	60.3
Num													20

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1997	-	-	-	-	-	-	-	-	-	8.0	25.8	18.1	-
Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	8.0	25.8	18.1	#DIV/0!
Num													0

Table 24 Supplemented Monthly Runoff and Collected Monthly Runoff Records (20/43)

No: 20 River Basin: S. Barito
 Station Name: Panaan River: S. Tabalong Kiwa
 Station ID by HPPS2: 03-027-07-02 Catchment Area (km2): 1,333

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1961	85.4	63.4	71.2	47.0	34.9	28.5	28.1	19.2	20.6	23.5	22.5	57.0	41.8
1962	73.0	70.2	72.6	62.8	49.5	34.5	28.0	28.1	27.8	27.3	40.4	70.5	48.7
1963	59.3	52.1	50.8	43.3	34.4	27.1	25.7	23.9	22.1	19.1	24.6	42.1	35.4
1964	58.7	57.8	59.6	51.6	40.0	29.5	28.2	26.6	24.8	22.7	31.0	56.1	40.6
1965	85.6	60.5	42.8	38.3	29.5	20.3	15.7	14.6	16.2	23.6	21.6	111.5	40.0
1966	81.6	66.7	65.6	56.0	43.7	31.0	24.4	24.6	24.2	23.4	33.8	61.2	44.7
1967	56.3	50.6	49.8	42.5	33.2	25.9	24.5	22.8	21.0	18.1	23.7	42.0	34.2
1968	77.1	79.4	83.9	73.4	57.2	38.0	30.6	24.5	20.4	24.5	46.2	83.1	53.2
1969	70.2	61.0	60.5	51.9	40.5	30.3	28.8	27.1	25.2	22.9	30.5	54.8	42.0
1970	79.4	78.6	82.4	71.8	56.4	37.7	30.8	24.7	26.2	28.3	47.6	81.3	53.8
1971	98.2	85.4	62.3	64.9	31.5	23.9	19.1	22.5	22.7	22.5	44.2	35.6	44.4
1972	38.5	36.2	35.5	30.8	26.3	24.2	21.7	18.9	16.7	19.1	20.7	29.0	26.5
1973	60.3	65.0	69.2	59.7	46.8	31.5	25.3	25.5	25.3	24.9	38.4	68.8	45.1
1974	65.5	59.0	59.4	50.8	39.4	29.3	27.9	26.2	24.3	22.1	30.0	54.4	40.7
1975	83.4	93.6	107.1	97.9	96.1	51.4	99.7	68.5	66.9	86.8	117.0	135.2	92.0
1976	105.0	104.9	127.1	100.3	45.1	39.3	52.7	42.3	40.2	35.9	83.3	84.6	71.7
1977	82.2	97.7	54.8	50.3	59.8	60.3	37.9	33.0	32.7	28.0	32.3	50.7	51.6
1978	76.8	77.0	80.1	70.1	55.6	38.6	32.1	32.1	31.6	31.3	46.9	77.8	54.2
1979	71.4	63.9	63.8	55.1	43.4	33.0	31.5	29.7	27.8	25.4	33.1	57.4	44.6
1980	58.7	54.2	53.9	46.2	36.4	28.6	27.0	25.4	23.6	20.7	26.6	46.3	37.3
1981	54.8	52.4	52.8	45.4	35.3	27.3	25.9	24.2	22.5	19.8	25.8	46.3	36.0
1982	59.7	57.7	59.2	51.1	39.5	29.2	27.8	26.3	24.5	22.3	30.5	55.5	40.3
1983	74.5	72.8	75.5	65.6	51.5	34.6	28.3	28.6	28.1	27.9	43.4	74.6	50.5
1984	74.6	68.2	69.5	59.5	47.3	33.4	26.7	26.8	26.4	25.6	36.9	65.6	46.7
1985	54.2	47.1	45.5	38.2	31.7	29.2	26.3	23.3	20.9	23.7	26.4	39.9	33.9
1986	59.8	60.0	62.3	53.7	42.2	30.2	23.6	23.7	23.5	22.4	32.3	59.2	41.1
1987	63.4	58.8	59.7	51.4	39.8	29.4	28.0	26.5	24.6	22.4	30.6	55.6	40.8
Ave	70.7	66.5	65.8	56.7	43.9	32.5	30.6	27.4	26.3	26.5	37.8	62.8	45.6
Num													27

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1991	32.8	19.7	13.3	23.6	23.7	6.8	2.8	1.1	0.3	0.7	23.1	59.1	17.3
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	68.1	82.5	121.4	36.3	15.7	22.7	10.1	1.7	8.6	13.1	37.3	31.8	37.4
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	26.7	40.7	56.1	172.1	53.6	67.2	34.4	1.0	2.7	12.1	14.3	27.0	42.3
1996	51.4	77.2	34.8	74.2	16.2	-	14.8	9.8	23.5	32.5	24.5	20.0	-
1997	22.7	11.1	5.7	8.5	8.3	5.0	3.7	2.5	1.1	1.6	4.5	23.2	8.2
1998	29.7	10.1	6.6	8.1	14.5	30.4	15.4	15.5	15.2	33.9	67.8	70.1	26.4
Ave	38.6	40.2	39.6	53.8	22.0	26.4	13.6	5.3	8.6	15.6	28.6	38.5	26.3
Num													5

Table 25 Supplemented Monthly Runoff and Collected Monthly Runoff Records (21/43)

No: 21 River Basin: S. Bone
 Station Name: Tulabolo River: S. Bone
 Station ID by HPPS2: 04-003-01-01 Catchment Area (km2): 1,150

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1985	55.8	78.8	49.3	54.7	66.7	65.4	38.1	65.4	53.6	53.6	86.1	65.4	61.1
1986	64.2	54.7	53.6	58.1	55.8	53.6	51.4	39.5	35.1	36.8	46.2	37.7	48.9
1987	40.4	41.3	31.0	38.6	54.7	33.4	22.4	21.7	16.9	27.2	50.3	31.4	34.1
1988	54.7	59.3	84.6	76.0	133.1	107.0	125.3	107.0	103.6	70.6	62.9	44.2	85.7
1989	80.2	92.2	83.1	92.2	55.8	255.3	74.6	59.3	73.2	73.2	64.2	49.3	87.7
1990	76.0	57.8	53.8	62.1	77.5	95.8	60.7	54.6	50.3	60.5	51.4	39.5	61.7
1991	74.6	57.0	46.2	86.1	71.9	74.6	46.2	41.3	31.0	28.7	37.7	62.9	54.9
1992	48.2	39.5	35.9	34.2	73.2	81.6	66.7	48.2	38.6	41.3	50.3	64.1	51.8
1993	43.2	39.5	46.5	56.5	108.9	95.5	60.7	54.6	50.3	49.0	56.1	49.3	59.2
Ave	59.7	57.8	53.8	62.1	77.5	95.8	60.7	54.6	50.3	49.0	56.1	49.3	60.6
Num													9

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 26 Supplemented Monthly Runoff and Collected Monthly Runoff Records (22/43)

No: 22 River Basin: S. Munte
 Station Name: Tincep River: S. Munte
 Station ID by HPPS2: 04-127-01-01 Catchment Area (km2): 54

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1924	2.90	1.98	4.01	3.56	3.42	2.86	2.01	2.13	2.81	2.81	4.58	6.92	3.33
1925	3.41	3.62	3.90	4.53	3.64	2.86	2.40	2.17	2.08	1.97	3.00	2.41	3.00
1926	3.48	3.04	2.42	3.69	3.65	3.50	3.12	1.71	2.80	2.18	2.58	3.52	2.97
1927	3.30	3.08	3.61	3.38	2.41	3.17	2.33	1.64	1.59	2.41	3.57	2.39	2.74
1928	2.99	6.95	3.93	4.67	4.03	3.56	2.12	1.71	1.67	1.72	2.15	2.16	3.14
1929	3.39	3.06	4.34	2.82	3.71	6.38	2.39	1.66	1.89	1.71	2.89	3.60	3.15
1930	2.41	3.34	2.16	3.40	3.42	1.88	1.51	1.32	1.20	1.36	2.58	3.48	2.34
1931	2.82	1.65	1.86	2.18	3.28	2.70	3.04	3.00	1.54	2.24	2.16	3.38	2.49
1932	6.86	4.00	2.86	3.34	2.90	3.84	2.74	2.36	1.79	2.23	2.49	2.97	3.20
1933	4.12	4.33	3.11	4.10	4.04	3.09	2.05	1.83	2.11	3.15	5.01	3.72	3.39
1934	4.39	5.52	4.95	4.31	4.13	3.65	3.01	2.57	2.19	3.95	4.68	5.31	4.06
1935	4.01	3.81	7.58	4.96	4.50	5.81	3.74	3.20	2.67	4.62	6.29	4.69	4.66
1936	5.24	3.34	5.73	4.92	5.11	5.44	3.61	2.66	2.61	2.97	4.23	4.35	4.18
1937	4.21	3.93	3.14	4.29	4.46	4.25	3.58	2.34	2.46	2.55	2.95	4.71	3.57
1938	6.64	3.66	3.99	4.38	2.98	3.15	3.20	2.62	2.25	1.99	2.51	3.98	3.45
1939	3.17	5.15	3.32	4.15	4.29	3.73	2.73	2.05	2.01	1.83	3.19	3.78	3.28
1940	3.34	4.11	3.07	3.72	5.11	3.42	2.07	1.92	1.88	1.69	2.30	3.04	2.97
1941	3.01	2.15	1.59	1.88	3.81	2.61	1.54	1.45	1.42	1.26	1.64	1.16	1.96
Ave	3.87	3.71	3.64	3.79	3.83	3.66	2.62	2.13	2.05	2.37	3.27	3.64	3.22
Num													18

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 27 Supplemented Monthly Runoff and Collected Monthly Runoff Records (23/43)

No: 23 River Basin: S. Palu
 Station Name: Palili River: S. Lindu
 Station ID by HPPS2: 04-112-02-02 Catchment Area (km²): 593

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	13.0	12.9	18.0	42.8	33.0	29.3	20.4	13.9	7.5	7.2	8.4	23.5	19.2
1973	22.6	17.1	32.9	46.2	44.9	28.9	25.9	23.8	34.9	28.8	36.3	30.3	31.1
1974	19.0	16.5	9.8	17.9	20.3	18.9	21.3	16.1	18.6	30.3	27.5	16.6	19.4
1975	12.7	14.8	31.0	29.2	28.1	21.9	37.8	32.0	27.0	21.5	21.8	18.2	24.7
1976	11.3	4.3	12.6	11.5	20.9	15.7	21.6	12.1	14.4	11.1	19.4	24.4	14.9
1977	9.2	13.1	15.2	22.7	23.0	44.3	35.4	23.2	14.7	6.9	17.0	17.8	20.2
1978	18.9	14.2	35.1	31.0	28.7	28.3	34.1	29.9	31.4	27.8	34.7	28.6	28.6
1979	14.5	20.9	6.3	36.3	31.7	27.7	37.6	27.9	28.8	11.5	25.2	32.6	25.1
1980	9.0	7.2	8.7	13.0	21.7	22.2	22.5	34.5	11.3	11.8	14.1	20.4	16.4
1981	6.1	12.7	17.6	37.4	16.0	13.2	24.4	14.4	26.1	32.4	22.2	12.0	19.5
1982	20.0	18.5	11.0	32.0	11.9	32.9	15.9	17.4	8.3	5.1	14.5	11.3	16.6
1983	21.1	16.9	8.8	16.7	27.1	26.2	29.0	29.0	16.9	12.3	15.9	14.8	19.6
1984	18.0	22.2	26.2	33.6	29.1	31.5	15.9	20.1	27.1	22.5	17.6	18.8	23.6
1985	14.6	15.6	27.4	22.4	31.4	14.4	15.4	16.3	17.1	15.1	25.0	31.4	20.5
1986	17.5	16.2	23.0	30.0	35.9	18.4	16.2	8.9	8.0	11.3	15.0	23.9	18.7
Ave	15.2	14.9	18.9	28.2	26.9	24.9	24.9	21.3	19.5	17.0	21.0	21.6	21.2
Num													15

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	26.3	24.7	16.8	29.3	37.4	24.8	18.2	13.4	12.6	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 28 Supplemented Monthly Runoff and Collected Monthly Runoff Records (24/43)

No: 24 River Basin: S. Gilirang
 Station Name: Gilirang River: S. Gilirang
 Station ID by HPPS2: 04-072-01-01 Catchment Area (km²): 230

Supplemented Monthly Runoff in HPPS2													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1979	1.3	5.5	1.1	11.9	14.5	36.1	12.4	3.1	11.6	0.3	0.7	0.6	8.3
1980	1.8	2.4	1.5	9.4	17.5	23.1	1.7	6.6	0.5	0.4	0.2	0.2	5.4
1981	0.2	0.2	1.7	35.4	17.4	9.7	62.0	2.1	7.4	6.8	9.5	0.9	12.8
1982	0.8	0.5	1.6	3.6	10.2	19.6	0.8	0.2	0.1	0.1	0.5	1.9	3.3
1983	2.9	8.3	0.7	12.1	25.6	32.4	21.1	7.5	0.7	2.3	1.2	0.2	9.6
1984	1.1	8.0	1.7	6.1	30.6	22.5	65.6	16.0	2.9	2.4	0.8	0.7	13.2
1985	1.1	5.4	1.2	0.4	14.6	15.9	12.4	13.4	1.5	2.1	1.5	1.0	5.9
1986	1.9	0.7	2.7	9.5	20.1	23.0	21.9	9.0	2.6	3.5	8.0	1.0	8.7
1987	1.6	0.6	2.9	29.3	33.0	16.5	3.8	1.0	2.9	1.1	3.9	1.4	8.2
1988	3.2	2.2	3.3	14.7	24.1	26.2	31.5	8.5	4.9	6.0	1.6	2.8	10.8
1989	4.9	2.0	1.5	3.1	3.7	16.5	20.4	46.9	25.5	13.5	1.5	0.3	11.7
1990	0.4	20.4	1.6	3.7	11.2	9.2	8.9	3.6	3.3	7.8	2.0	0.7	6.1
1991	6.0	0.2	0.7	16.7	20.1	18.6	8.6	1.8	0.6	0.5	0.1	0.4	6.2
1992	0.5	5.7	2.0	11.6	9.6	12.6	18.0	6.8	8.7	2.9	1.1	0.6	6.7
1993	0.3	0.1	0.3	3.1	27.0	22.9	17.3	0.8	0.2	0.7	0.5	1.1	6.2
Ave	1.9	4.1	1.6	11.4	18.6	20.3	20.4	8.5	4.9	3.4	2.2	0.9	8.2
Num													15

Collected Monthly Runoff													Unit:m ³ /s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	2.0	1.0	4.7	12.1	44.7	*	13.4	3.3	0.9	0.6	0.7	2.5	-
1995	1.3	1.4	5.3	2.7	58.2	88.1	96.5	32.7	12.3	5.3	6.2	1.4	26.0
1996	0.7	1.9	1.6	17.4	30.4	*	*	14.0	8.3	7.7	3.1	1.6	-
1997	1.2	0.7	2.0	9.2	2.3	*	3.2	0.6	0.2	0.1	0.0	0.6	-
1998	0.6	1.8	3.1	43.5	*	1.4	6.1	0.6	9.5	7.2	3.5	1.1	-
1999	0.5	0.2	0.2	0.4	26.2	*	2.2	1.6	0.8	18.8	3.6	1.2	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	3.0	0.7	0.7	6.7	27.4	34.6	6.6	5.0	5.8	15.2	4.6	7.7	9.8
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	1.9	3.7	9.0	13.7	19.2	*	17.1	38.3	5.2	4.3	2.6	22.5	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	0.9	2.2	*	22.7	6.8	1.9	1.7	16.2	2.4	3.7	-
2006	1.3	1.1	0.8	0.6	2.6	6.9	3.3	0.8	0.1	0.1	0.4	0.8	1.6
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	0.6	0.7	0.8	3.3	*	*	*	*	*	*	*	*	-
Ave	1.3	1.3	2.6	10.2	26.4	30.7	17.3	9.9	4.5	7.5	2.7	4.3	12.5
Num													3

Note: Maximum runoff in 1994, 1996, 1997, 1998, 1999, 2003, and 2005 are much higher than others. Hydrograph in 2008 has irregular shape. These data are judge as unreliable.

Table 29 Supplemented Monthly Runoff and Collected Monthly Runoff Records (25/43)

No: 25 River Basin: S. Cenranae
 Station Name: Bila River: S. Bila Hilir
 Station ID by HPPS2: 04-073-03-01 Catchment Area (km²): 379

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1972	13.0	5.1	3.9	8.4	16.6	8.2	5.7	6.6	3.1	1.7	1.3	3.7	6.4
1973	4.4	21.2	10.2	24.0	45.2	26.6	50.7	28.2	36.1	19.5	14.6	28.1	25.7
1974	7.7	8.8	3.7	15.1	18.5	16.8	31.9	12.2	54.2	28.2	18.3	13.1	19.0
1975	9.8	28.7	23.3	10.1	33.7	25.4	36.1	33.3	47.2	28.9	14.8	11.0	25.2
1976	5.6	3.5	10.0	7.8	21.6	14.5	10.9	11.8	2.9	4.9	11.5	9.5	9.5
1977	9.2	3.3	7.7	29.5	17.2	25.8	10.6	17.2	2.5	2.4	2.5	31.0	13.2
1978	18.3	11.7	27.2	19.2	30.3	24.8	24.7	17.8	19.2	10.9	7.2	24.7	19.7
1979	8.7	13.7	12.8	24.6	18.4	28.2	12.1	3.8	14.4	3.3	5.5	12.2	13.1
1980	13.3	6.6	5.9	24.7	32.1	31.8	9.4	8.9	4.9	3.4	3.6	6.4	12.6
1981	2.7	3.0	14.3	23.5	49.0	16.8	50.7	5.0	10.4	8.4	7.5	7.6	16.6
1982	7.8	5.3	24.3	28.5	18.2	20.0	3.5	2.8	2.8	2.3	2.3	3.2	10.1
1983	13.2	22.5	14.5	14.6	33.0	30.5	37.8	6.5	10.7	4.0	3.0	3.6	16.2
1984	6.2	10.1	12.5	36.4	66.2	51.0	49.4	12.2	9.7	4.1	10.4	6.3	22.9
1985	2.6	12.7	7.2	9.5	30.9	27.2	17.7	13.9	2.9	4.6	7.9	10.3	12.3
1986	9.9	4.4	23.4	12.7	23.0	25.0	18.6	6.7	5.1	6.8	14.5	7.7	13.2
Ave	8.8	10.7	13.4	19.2	30.3	24.8	24.7	12.5	15.1	8.9	8.3	11.9	15.7
Num													15

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1987	19.0	5.5	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	22.8	8.7	17.8	35.5	29.9	21.6	20.6	12.0	7.2	16.3	15.0	18.3	18.8
1992	17.6	20.1	31.4	39.0	37.6	21.6	27.8	17.1	23.3	17.9	23.4	23.9	25.1
1993	30.3	2.9	6.3	40.7	56.8	32.5	15.5	6.2	3.0	3.3	11.7	13.9	18.6
1994	8.2	7.0	16.7	13.4	12.6	24.9	14.5	14.2	15.8	*	*	*	-
1995	*	18.9	17.5	12.2	31.8	127.5	81.6	52.7	36.0	31.7	37.9	12.9	-
1996	13.4	19.8	31.0	38.6	49.9	35.3	*	*	*	25.5	14.4	20.7	-
1997	15.3	15.6	11.9	20.0	19.0	15.9	29.7	9.1	3.2	3.0	3.6	5.7	12.7
1998	*	*	*	*	*	*	*	*	*	*	*	*	-
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	23.9	13.0	16.8	17.3	32.1	14.9	5.5	-	-	-	-	-	-
Ave	18.8	12.4	18.7	27.1	33.7	36.8	27.9	18.5	14.7	16.3	17.7	15.9	18.8
Num													4

Note: Hydrographs in 1994, 1995 and 1996 has irregular shape.

Base flow in 1998 is much higher than others. These data are judged as irregular value.

Table 30 Supplemented Monthly Runoff and Collected Monthly Runoff Records (26/43)

No: 26 River Basin: Jene Klara
 Station Name: Likupande River: Jene Klara
 Station ID by HPPS2: 04-083-01-01 Catchment Area (km2): 381

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1970	11.3	19.3	14.3	20.8	21.3	10.0	12.3	7.1	4.7	5.7	27.6	35.6	15.8
1971	26.1	45.1	53.5	24.9	31.7	20.5	9.0	4.9	4.6	7.1	32.6	16.5	23.0
1972	63.2	20.1	11.5	12.0	9.7	5.1	4.2	1.7	1.1	1.4	1.0	6.2	11.4
1973	18.7	13.1	18.9	18.6	19.7	12.9	18.9	6.8	6.3	4.5	12.4	19.2	14.2
1974	32.6	34.6	73.7	68.5	12.5	7.3	9.4	4.3	10.7	14.3	16.3	10.5	24.5
1975	26.6	29.8	16.9	25.3	23.9	17.2	8.0	8.0	8.4	13.4	22.0	19.0	18.2
1976	31.5	21.2	22.6	24.5	20.7	11.7	5.6	3.5	2.8	2.9	10.5	12.0	14.1
1977	30.8	52.9	25.4	13.7	10.2	22.5	4.8	4.3	3.3	1.0	0.9	8.8	14.9
1978	17.9	17.8	14.2	12.3	22.4	23.9	17.9	8.6	7.0	5.0	6.9	20.3	14.5
1979	23.4	12.4	21.3	17.8	20.9	13.4	5.4	2.7	2.1	2.4	3.0	10.1	11.2
1980	21.3	28.8	13.2	15.8	15.1	5.4	3.7	2.0	1.4	1.6	6.4	17.1	11.0
1981	21.9	14.2	9.3	22.1	16.2	7.5	14.2	5.2	3.8	5.1	17.8	22.8	13.3
Ave	27.1	25.8	24.6	23.0	18.7	13.1	9.4	4.9	4.7	5.4	13.1	16.5	15.5
Num													12

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1992	6.9	8.0	19.7	18.7	5.4	6.4	3.0	1.3	0.9	1.6	1.8	3.5	6.4
1993	24.0	20.3	11.3	19.6	20.4	13.2	2.5	1.2	0.7	0.5	0.4	*	-
1994	*	*	*	*	*	*	*	*	*	*	*	*	-
1995	35.1	8.8	22.6	29.4	10.8	23.9	9.4	0.8	0.7	1.2	15.3	19.7	14.8
1996	7.7	32.0	21.4	16.3	1.9	2.7	14.2	1.2	0.8	1.8	10.3	37.7	12.3
1997	16.5	19.5	11.2	3.4	1.2	0.7	0.7	0.4	0.3	0.3	0.6	1.3	4.7
1998	2.2	13.2	15.7	31.7	18.2	7.3	12.5	7.7	2.6	2.0	4.1	5.0	10.2
1999	39.5	34.6	23.1	15.4	11.1	4.8	8.3	0.9	0.4	2.5	6.9	26.5	14.5
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	17.7	35.1	18.1	32.6	6.7	17.6	1.5	0.5	0.3	2.8	4.1	27.4	13.7
2002	*	*	*	*	*	*	*	*	*	*	*	*	-
2003	27.7	26.8	7.7	8.8	24.5	3.1	2.4	2.6	2.1	2.9	9.7	50.9	14.1
2004	*	*	*	*	*	*	*	*	*	*	*	*	-
Ave	19.7	22.0	16.8	19.5	11.1	8.8	6.1	1.8	1.0	1.7	5.9	21.5	11.3
Num													8

Note: Hydrographs in 1993, 1994, 2002, and 2004 have irregular shapes and are judged as unreliable value.

Table 31 Supplemented Monthly Runoff and Collected Monthly Runoff Records (7/43)

No: 27 River Basin: S. Sadang
 Station Name: Bakaru River: S. Mamasa
 Station ID by HPPS2: 04-093-03-01 Catchment Area (km2): 1,080

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1976	44.3	26.8	49.1	36.2	54.0	37.1	30.2	23.6	26.3	74.5	144.0	243.8	65.8
1977	62.8	51.2	47.0	109.3	72.9	100.8	159.6	29.2	17.2	12.8	182.2	105.1	79.2
1978	112.9	53.9	121.0	93.0	54.7	62.2	58.2	51.1	73.8	55.8	63.9	67.7	72.3
1979	60.4	73.4	52.7	73.6	69.3	58.6	73.8	31.7	23.4	41.6	68.5	100.9	60.7
1980	86.1	60.8	60.1	215.6	150.4	164.6	86.2	73.1	53.0	48.6	46.2	56.9	91.8
1981	43.2	36.8	63.8	101.4	85.0	73.8	75.5	49.0	45.2	59.4	99.5	75.8	67.4
1982	94.9	76.3	99.6	94.9	75.2	70.1	35.7	25.8	18.1	16.6	16.7	41.5	55.4
1983	71.6	82.9	47.6	87.7	111.8	118.6	76.0	57.3	37.6	38.1	45.2	52.5	68.9
1984	74.5	88.5	96.9	155.3	166.0	89.5	78.6	75.3	83.5	58.7	59.4	84.2	92.5
1985	81.0	102.5	61.9	89.0	96.5	74.3	59.4	57.4	47.3	37.3	49.4	55.1	67.6
1986	59.9	54.2	87.7	87.3	86.9	69.3	76.1	34.8	29.3	52.8	83.5	74.5	66.4
1987	87.8	67.9	108.0	139.5	93.3	52.9	51.2	36.6	20.1	16.9	15.7	143.6	69.5
1988	61.1	74.0	109.0	109.4	132.3	47.0	42.5	51.2	68.9	87.1	121.7	100.2	83.7
1989	112.5	117.5	74.7	85.2	52.9	67.6	97.7	58.6	54.8	63.0	69.4	70.0	77.0
1990	59.6	90.4	51.0	73.6	72.5	71.3	63.6	42.9	41.6	39.7	32.3	78.8	59.8
1991	61.0	35.2	63.3	78.1	50.5	34.4	23.8	18.7	14.9	13.5	30.5	68.5	41.0
1992	83.5	69.3	79.7	83.4	84.7	78.4	53.5	37.0	40.7	35.3	40.3	88.1	64.5
1993	103.3	53.1	69.8	104.8	90.7	90.1	47.8	30.8	23.4	25.3	44.4	73.3	63.1
1994	64.8	102.6	143.5	100.2	90.5	76.3	36.8	26.5	20.7	21.7	23.3	82.4	65.8
Ave	75.0	69.3	78.2	100.9	88.9	75.6	64.5	42.7	38.9	42.0	65.1	87.5	69.1
Num													19

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 32 Supplemented Monthly Runoff and Collected Monthly Runoff Records (28/43)

No: 28 River Basin: Cimandiri
 Station Name: Kebon Randu River: Cicatih
 Station ID by HPPS2: 02-107-06-01 Catchment Area (km2): 486

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1966	30.6	21.3	26.9	27.2	24.1	18.6	8.0	7.9	13.2	28.0	31.2	32.3	22.4
1967	32.9	31.5	27.5	35.0	30.2	96.8	21.1	25.7	23.5	10.8	20.5	24.9	31.7
1968	32.3	31.8	32.5	50.7	31.7	30.6	41.4	36.1	39.2	41.9	47.7	33.2	37.4
1969	35.3	30.7	30.2	31.5	28.4	20.4	16.7	10.8	13.6	18.2	28.2	26.5	24.2
1970	28.1	25.8	31.4	27.6	32.0	25.3	16.2	9.7	13.7	19.7	33.6	34.3	24.8
1971	45.0	35.5	28.4	29.6	26.3	18.7	13.8	14.5	14.5	29.8	39.0	51.9	28.9
1972	45.3	50.3	43.3	35.0	42.7	18.4	12.9	12.3	10.0	11.5	24.3	33.9	28.3
1973	37.5	31.5	30.8	58.2	50.5	33.0	25.8	25.8	37.1	43.9	32.5	44.2	37.6
1974	32.8	21.0	19.6	31.6	33.8	14.8	21.1	25.7	37.5	36.4	37.5	29.7	28.5
1975	37.5	39.8	41.0	38.1	32.0	17.2	19.1	21.0	27.7	34.7	40.2	30.0	31.5
1976	36.0	26.8	24.8	19.4	14.8	14.8	14.3	14.8	18.9	28.9	36.6	35.4	23.8
1977	27.5	40.5	31.6	29.5	14.6	11.3	12.7	146.0	19.6	19.6	30.5	35.3	34.9
1978	27.9	20.8	34.1	35.5	30.6	34.6	30.1	28.8	26.5	33.7	37.2	23.2	30.3
1979	33.3	33.6	33.6	44.1	35.5	23.7	18.0	10.5	24.7	28.4	38.2	41.5	30.4
1980	40.9	28.8	34.2	38.0	30.0	23.3	23.0	31.2	23.3	25.7	46.0	44.6	32.4
1981	31.0	34.0	43.9	40.9	37.0	33.0	33.5	23.6	27.9	26.3	42.7	31.6	33.8
1982	36.2	27.1	18.8	26.2	11.5	8.8	10.6	9.2	8.7	10.8	13.2	24.3	17.1
1983	38.6	29.8	31.2	29.5	27.7	26.6	25.9	25.9	25.4	26.9	28.6	27.2	28.6
1984	37.8	33.8	36.5	36.2	31.5	35.9	25.0	23.3	44.4	27.8	37.0	31.4	33.4
1985	30.8	37.6	40.9	33.5	39.1	29.2	30.1	29.7	24.3	38.8	32.8	28.1	32.9
1986	41.8	36.3	47.8	56.8	29.9	25.8	22.1	20.2	20.7	26.5	42.0	44.4	34.5
1987	31.7	28.3	30.8	29.4	24.5	18.4	9.7	9.2	9.7	13.8	24.0	31.9	21.8
1988	31.3	38.8	50.1	34.2	36.9	22.3	17.6	28.6	29.7	30.2	33.0	31.5	32.0
1989	38.1	29.2	27.0	29.0	27.7	26.0	25.5	25.1	25.0	25.5	29.0	30.1	28.1
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	31.6	33.0	35.7	33.5	31.2	23.1	21.2	20.5	19.7	23.7	31.6	29.6	27.9
1992	32.0	30.8	31.0	33.7	31.2	29.4	28.9	29.4	31.4	36.3	33.5	33.8	31.8
1993	33.8	31.0	30.2	30.3	28.8	28.4	26.3	27.9	24.5	28.1	29.7	30.7	29.1
Ave	34.7	31.8	33.1	35.0	30.2	26.2	21.1	25.7	23.5	26.9	33.3	33.2	29.6
Num													27

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 33 Supplemented Monthly Runoff and Collected Monthly Runoff Records (29/43)

No: 29 River Basin: Cibuni
 Station Name: Cibuni-3 damsite River: Cibuni
 Station ID by HPPS2: - Catchment Area (km2): 1,124

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1953	86.6	110.4	145.2	120.2	100.9	38.6	17.5	8.5	6.2	7.7	60.6	67.9	64.2
1954	147.1	134.5	96.5	68.9	91.4	85.0	36.8	58.7	28.1	68.2	174.3	152.4	95.2
1955	105.5	70.8	72.0	88.5	64.8	39.7	75.5	109.3	93.1	155.0	205.1	175.9	104.6
1956	115.3	65.6	80.9	105.0	82.3	91.0	58.4	60.3	54.5	97.4	107.7	100.1	84.9
1957	95.9	61.5	106.9	97.8	86.0	40.2	56.3	55.7	23.8	18.2	55.3	103.3	66.7
1958	101.9	185.2	144.4	101.7	86.9	54.8	83.8	85.1	48.8	85.6	109.2	170.1	104.8
1959	64.3	94.4	97.9	68.7	91.8	61.0	34.7	14.0	8.6	9.9	54.8	80.2	56.7
1960	130.9	96.3	69.5	83.2	62.8	30.7	37.8	12.2	8.9	17.1	119.8	91.2	63.4
1961	63.0	93.1	95.0	102.6	71.3	41.0	15.4	8.5	7.2	7.0	25.0	62.7	49.3
1962	82.4	43.4	148.2	146.9	75.3	49.5	56.5	22.8	16.4	63.9	92.5	123.6	76.8
1963	62.4	41.6	57.4	61.2	30.8	13.4	7.5	6.3	6.2	6.0	19.5	61.0	31.1
1964	84.1	104.3	114.9	129.4	94.0	46.2	25.3	25.9	38.6	61.3	114.8	103.2	78.5
1965	139.8	155.6	80.0	69.0	22.3	10.7	6.8	5.7	5.6	5.5	28.3	186.2	59.6
1966	127.1	84.8	164.6	110.3	76.5	54.0	17.7	8.2	11.9	84.0	108.9	142.3	82.5
1967	134.1	77.3	63.4	136.0	62.9	23.8	10.1	5.7	5.3	5.8	67.8	115.6	59.0
1968	105.7	60.3	131.3	123.8	119.8	95.3	82.4	98.5	69.6	61.5	124.5	163.8	103.0
1969	161.2	116.1	132.7	129.8	69.0	49.4	17.3	8.2	31.8	44.8	91.9	102.9	79.6
1970	129.8	96.8	153.1	139.5	132.7	108.4	46.4	18.1	22.2	33.4	138.6	150.1	97.4
1971	148.7	84.0	70.8	103.2	65.3	39.4	17.5	9.6	12.4	57.7	143.1	174.6	77.2
1972	117.7	125.7	88.4	105.5	103.7	32.6	14.1	7.4	6.5	6.4	30.6	88.6	60.6
1973	126.6	103.1	126.1	150.8	204.4	96.9	74.1	82.9	84.6	114.8	162.3	136.4	121.9
1974	80.7	82.3	65.0	134.7	108.0	37.7	53.5	51.6	63.0	114.7	145.2	94.3	85.9
1975	138.4	81.3	143.5	124.0	104.6	52.5	46.0	21.9	55.2	147.7	164.6	124.2	100.3
1976	90.8	94.5	93.8	79.3	42.1	24.7	10.6	9.3	17.5	42.1	117.5	115.1	61.4
1977	96.3	87.6	114.3	117.1	80.3	98.3	32.3	14.6	8.3	7.3	53.0	68.1	64.8
1978	116.1	51.6	136.0	60.3	141.4	128.2	119.9	76.2	55.2	63.8	119.9	179.6	104.0
1979	133.2	120.6	117.7	163.7	120.0	72.7	26.3	12.5	35.0	74.0	160.0	192.3	102.3
1980	109.4	81.6	97.0	120.0	73.6	35.8	24.5	4.5	28.6	56.5	160.2	151.8	78.6
1981	114.2	89.3	121.5	114.7	98.5	81.0	80.1	31.5	24.7	63.9	94.1	69.1	81.9
1982	83.1	62.8	57.6	102.4	33.0	18.1	10.3	7.8	7.6	7.4	22.3	104.8	43.1
Ave	109.7	91.9	106.2	108.6	86.5	55.0	39.8	31.4	29.5	53.0	102.4	121.7	78.0
Num													30

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 34 Supplemented Monthly Runoff and Collected Monthly Runoff Records (30/43)

No: 30 River Basin: Ciujung
 Station Name: Rangkasbitung River: Ciujung
 Station ID by HPPS2: 02-006-01-06 Catchment Area (km2): 1,383

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1970	73.6	201.1	211.1	221.2	147.1	135.8	90.2	32.0	52.7	50.1	113.8	208.5	128.1
1971	177.8	264.0	166.1	91.3	61.8	62.7	60.4	77.4	50.5	113.1	120.7	90.2	111.3
1972	259.7	138.8	186.8	80.8	103.5	24.2	13.5	20.9	6.2	9.3	34.1	62.2	78.3
1973	166.4	110.8	136.6	172.8	188.8	105.9	48.5	63.5	124.8	109.0	101.0	130.9	121.6
1974	189.4	142.8	140.1	115.2	127.5	58.2	65.6	91.0	184.1	96.1	80.0	88.2	114.9
1975	102.8	162.3	105.8	55.4	70.6	42.3	62.0	90.6	135.3	74.8	127.0	198.8	102.3
1976	273.9	101.3	128.4	94.9	58.4	37.7	23.4	24.3	15.0	43.9	76.0	50.4	77.3
1977	139.0	110.9	155.7	144.6	133.0	75.1	29.8	15.7	15.5	17.8	28.0	46.5	76.0
1978	182.9	89.4	139.1	85.8	74.3	70.7	61.1	83.5	73.9	77.1	94.6	77.6	92.5
1979	132.9	150.7	121.1	164.6	63.6	41.0	44.6	26.6	32.7	33.1	96.7	81.0	82.4
1980	227.3	120.2	72.2	114.6	99.3	47.1	49.4	93.5	97.4	72.8	94.1	135.7	102.0
1981	214.9	145.5	137.2	114.0	131.4	150.5	116.0	77.6	98.5	108.9	162.5	134.7	132.6
1982	262.3	87.7	45.2	84.3	59.7	25.7	16.7	8.9	6.0	15.8	84.8	107.1	67.0
1983	90.8	65.5	54.5	47.5	68.9	32.3	22.9	10.3	13.4	35.2	104.9	77.6	52.0
1984	118.3	121.3	139.4	144.1	135.9	44.8	78.1	83.2	119.1	71.4	48.8	49.6	96.2
1985	73.8	151.2	139.9	74.5	75.4	26.3	53.4	41.0	67.0	50.5	79.9	125.5	79.9
1986	211.2	120.6	123.7	152.0	94.5	104.0	23.5	25.6	31.4	50.6	64.3	142.5	95.3
1987	119.6	154.9	110.6	134.7	128.8	131.4	80.6	58.2	37.9	37.8	51.2	60.0	92.1
1988	150.9	184.2	223.7	213.4	92.1	39.0	42.6	44.9	46.1	48.5	65.4	122.9	106.1
1989	76.5	264.0	89.8	53.3	85.9	47.3	39.4	53.3	64.0	54.2	67.8	101.1	83.1
1990	388.1	99.8	127.9	84.4	84.7	73.4	115.6	101.5	122.5	90.7	77.4	55.3	118.4
1991	40.9	179.0	76.1	49.5	18.1	12.7	12.6	9.9	16.4	29.2	30.8	57.2	44.4
1992	79.8	90.3	81.6	107.7	84.1	50.2	31.8	40.0	39.8	102.4	112.6	67.6	74.0
1993	189.3	169.1	98.0	136.4	174.4	111.8	59.0	155.1	147.7	111.6	117.3	142.6	134.4
Ave	164.3	142.7	125.4	114.0	98.4	64.6	51.7	55.4	66.6	62.7	84.7	100.6	94.3
Num													24

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	85.5	62.2	58.4	110.4	146.0	33.7	8.4	6.3	4.4	8.5	41.4	32.2	49.8
1995	80.6	44.7	37.6	83.0	108.7	83.0	74.4	31.7	18.8	31.4	86.9	157.2	69.8
1996	109.3	91.0	165.8	91.9	66.8	62.4	49.9	51.4	51.9	54.5	96.2	135.2	85.5
1997	81.7	89.0	71.8	77.9	91.5	40.5	21.2	7.7	9.2	6.1	23.0	45.2	47.1
1998	56.9	111.1	123.9	123.9	78.1	43.9	41.0	52.0	46.6	35.4	47.6	73.3	69.5
1999	266.1	-	73.2	59.8	64.3	52.8	44.4	24.5	35.0	66.2	64.1	105.5	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	57.7	84.5	113.9	64.4	60.6	67.2	40.8	27.8	25.0	40.9	36.3	100.4	60.0
Ave	105.4	80.4	92.1	87.3	88.0	54.8	40.0	28.8	27.3	34.7	56.5	92.7	63.6
Num													6

Table 35 Supplemented Monthly Runoff and Collected Monthly Runoff Records (31/43)

No: 31 River Basin: Cimanuk
 Station Name: Leuwi Goong River: Cimanuk
 Station ID by HPPS2: 02-026-01-06 Catchment Area (km2): 760

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1964	22.0	21.4	27.7	28.6	20.5	14.8	13.9	13.3	13.3	27.3	44.2	30.8	23.1
1965	36.1	43.6	34.3	29.2	21.5	14.3	12.1	7.7	6.4	6.6	13.8	33.7	21.6
1966	55.7	50.2	56.1	34.6	23.3	20.5	10.5	8.2	11.2	21.1	19.4	39.7	29.2
1967	33.9	39.7	29.7	38.6	15.3	8.9	11.7	6.9	7.2	10.6	17.2	35.9	21.3
1968	36.8	25.5	37.5	32.4	34.9	27.5	32.7	34.3	19.5	22.1	34.4	46.0	32.0
1969	52.1	48.3	43.0	46.4	30.0	25.6	18.8	15.9	16.9	16.9	20.3	23.6	29.8
1970	29.3	34.5	50.3	36.0	30.5	22.7	20.8	12.4	15.5	18.2	31.0	50.5	29.3
1971	61.4	41.7	45.2	62.0	34.9	20.6	12.9	9.2	11.2	27.3	58.1	54.4	36.6
1972	43.9	32.8	49.6	32.9	42.7	17.7	10.8	8.5	6.4	6.2	12.5	18.6	23.5
1973	26.6	32.1	38.1	42.6	61.7	35.8	30.6	16.4	42.1	28.1	45.4	40.0	36.6
1974	24.9	40.8	29.3	50.8	41.9	15.6	16.9	24.6	21.7	44.7	47.9	57.2	34.7
1975	52.4	55.1	51.3	58.6	35.5	19.1	14.5	9.7	12.0	49.5	47.8	37.2	36.9
1976	37.0	37.1	44.2	26.6	21.4	11.2	8.1	7.3	7.2	23.5	37.1	27.9	24.0
1977	30.3	53.0	46.4	42.0	34.5	34.0	12.1	8.4	8.4	6.4	10.3	22.9	25.7
1978	23.3	21.0	44.0	20.5	24.0	36.6	37.7	20.2	27.2	22.6	42.3	45.5	30.4
1979	43.6	46.1	34.8	62.9	57.5	27.1	15.6	12.7	12.0	15.3	30.0	38.6	33.0
1980	36.5	38.0	33.7	34.0	20.9	14.8	10.8	13.2	9.4	10.3	24.3	36.6	23.5
1981	28.2	27.9	44.4	39.0	36.7	27.4	27.0	12.5	12.6	15.0	35.5	33.6	28.3
1982	40.3	41.0	40.7	52.7	16.8	15.0	10.1	8.1	6.5	6.0	9.4	27.7	22.9
1983	31.6	32.4	32.6	38.3	36.3	14.6	13.0	9.7	8.5	15.4	31.1	25.1	24.0
1984	49.7	77.8	58.2	52.0	42.2	15.7	13.4	14.8	36.3	37.0	38.4	52.9	40.7
1985	33.6	36.3	31.5	33.0	22.3	29.4	31.3	17.5	9.9	29.3	34.6	38.4	28.9
1986	41.2	33.9	53.6	49.0	22.0	26.0	22.7	16.8	32.6	29.2	49.0	27.0	33.6
1987	30.5	38.6	38.1	30.3	34.4	27.8	24.8	13.8	10.7	11.8	9.3	33.1	25.3
1988	64.8	58.1	50.5	51.3	36.5	60.7	44.3	26.2	14.8	15.6	50.4	71.3	45.4
1989	245.9	53.3	41.5	34.0	34.0	35.5	23.7	17.6	14.4	14.8	21.9	24.0	46.7
1990	25.1	43.6	34.4	30.4	34.4	27.0	18.2	28.7	14.5	13.0	13.7	39.4	26.9
1991	49.0	32.3	36.8	40.4	23.3	10.9	10.6	9.7	9.6	9.7	26.3	30.6	24.1
1992	34.9	45.8	52.0	55.1	30.1	23.3	14.5	22.4	18.6	29.9	28.4	40.1	32.9
1993	46.8	37.3	49.5	44.3	27.5	21.6	14.1	16.3	11.9	11.5	16.7	34.1	27.7
Ave	45.6	40.6	42.0	40.9	31.6	23.4	18.6	14.8	14.9	19.8	30.0	37.2	30.0
Num													30

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1997	45.8	24.0	12.4	21.3	19.2	8.4	5.4	4.6	4.0	4.2	10.9	32.0	16.0
1998	39.6	68.4	76.8	66.3	55.4	41.3	25.2	18.6	14.0	37.9	73.3	69.7	48.9
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	52.5	35.3	18.7	52.1	20.1	13.9	11.0	7.9	7.7	36.8	62.9	56.6	31.3
2001	44.8	26.1	35.0	24.1	17.1	12.6	11.2	8.9	12.0	32.0	43.6	42.4	25.8
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	8.1	8.4	10.3	15.1	15.5	19.6	19.2	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	52.5	57.3	42.8	49.9	23.6	9.4	7.2	6.7	8.2	11.2	-	-	-
Ave	47.0	42.2	37.1	42.7	27.1	15.6	11.4	9.5	10.2	22.9	42.1	44.0	30.5
Num													4

Table 36 Supplemented Monthly Runoff and Collected Monthly Runoff Records (32/43)

No: 32 River Basin: K. Progo
 Station Name: Krangan -2 River: K. Progo
 Station ID by HPPS2: 02-082-01-06 Catchment Area (km2): 423

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1968	27.1	47.9	40.4	32.4	20.9	19.9	24.0	26.8	15.1	9.3	19.3	34.5	26.5
1969	28.4	19.6	28.1	28.7	20.4	14.8	6.1	4.9	4.4	8.2	12.2	15.0	15.9
1970	18.2	26.2	36.2	24.6	22.6	16.8	8.7	3.9	5.8	11.7	21.2	25.5	18.5
1971	27.9	28.6	28.9	23.6	24.4	21.2	12.5	8.0	5.4	16.6	24.8	21.7	20.3
1972	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	22.2	28.2	30.8	23.9	33.0	22.1	13.7	8.2	12.4	9.3	16.3	25.3	20.5
1974	11.3	40.5	32.8	22.2	23.2	8.1	9.2	9.8	17.5	24.6	23.6	21.0	20.3
1975	35.2	26.3	39.1	30.7	26.5	12.6	11.2	7.2	17.0	36.9	28.6	31.2	25.2
1976	22.0	24.3	33.3	21.0	10.1	8.2	3.8	3.7	3.5	9.7	19.1	12.3	14.3
1977	21.9	34.3	35.3	20.9	19.9	23.8	5.1	2.9	2.9	1.8	6.4	14.3	15.8
1978	24.8	28.2	22.2	20.0	22.1	18.2	23.2	14.0	11.8	14.0	12.8	22.8	19.5
1979	27.4	24.2	18.8	26.7	32.0	17.3	6.2	4.0	5.4	5.1	8.4	14.5	15.8
1980	26.4	19.4	29.8	25.1	15.1	6.9	5.8	5.8	4.4	6.9	17.5	19.4	15.2
1981	23.7	26.2	24.4	27.5	25.3	15.2	13.2	5.7	10.7	10.1	13.7	25.6	18.4
1982	44.9	46.2	36.6	26.8	8.0	4.8	3.7	2.8	2.6	2.2	4.3	13.5	16.4
1983	32.3	31.7	25.9	19.9	32.2	9.5	4.0	2.8	2.3	9.4	14.3	16.6	16.7
1984	38.5	42.3	31.7	38.3	11.6	6.5	5.6	3.4	7.4	12.6	8.9	27.8	19.5
1985	27.0	33.5	41.9	30.6	11.9	14.4	8.2	8.9	6.6	12.1	14.7	17.4	18.9
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	26.0	30.0	24.7	11.1	7.3	5.5	3.4	2.5	1.9	2.1	4.5	12.2	10.9
1988	25.4	26.3	20.8	10.4	11.7	5.2	3.4	3.4	2.1	6.9	13.6	13.1	11.9
1989	20.5	32.2	19.6	14.3	10.6	9.2	13.7	5.7	2.4	3.6	6.5	13.1	12.6
1990	36.3	26.9	20.4	17.7	14.2	15.5	8.4	5.3	5.2	3.3	7.6	20.2	15.1
1991	34.8	24.6	21.6	26.6	12.8	6.2	5.1	5.0	3.3	4.1	10.3	17.4	14.3
1992	20.5	19.1	21.4	22.3	12.4	5.8	3.8	6.3	4.9	7.6	11.1	16.9	12.7
1993	26.7	19.0	17.1	22.2	14.4	9.2	5.8	5.3	2.8	3.4	7.2	9.1	11.9
Ave	27.1	29.4	28.4	23.6	18.4	12.4	8.7	6.5	6.6	9.6	13.6	19.2	17.0
Num													24

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	16.7	16.1	21.3	13.7	7.9	5.0	4.6	3.8	1.9	2.5	5.8	7.8	8.9
1995	14.9	17.0	12.6	10.2	9.0	10.3	8.6	6.1	4.8	9.4	12.8	7.9	10.3
1996	22.8	29.8	24.6	19.7	9.8	8.7	7.4	7.1	*	3.6	7.6	7.8	-
1997	12.3	19.1	6.4	8.2	6.1	5.6	3.8	3.5	2.8	2.8	4.0	11.4	7.2
1998	12.4	16.8	17.5	17.6	12.8	13.6	14.3	9.1	6.4	11.4	13.8	14.9	13.4
1999	42.8	36.3	36.7	30.6	26.4	25.5	14.3	21.2	12.7	11.2	18.9	31.3	25.7
2000	3.3	3.9	4.9	4.0	4.0	2.4	1.0	0.7	0.8	1.3	3.8	3.1	2.8
2001	*	*	16.7	13.4	7.6	7.7	5.6	3.3	2.9	10.1	11.4	9.2	-
2002	27.5	26.8	25.5	31.2	19.6	17.5	15.5	14.1	15.6	12.8	17.8	25.1	20.8
2003	8.2	9.1	6.4	3.6	2.4	0.7	0.8	0.9	0.6	1.1	2.3	3.8	3.3
2004	16.7	16.1	19.1	15.1	11.2	7.2	7.0	4.5	4.2	4.7	10.1	15.2	10.9
Ave	17.8	19.1	17.4	15.2	10.6	9.5	7.5	6.8	5.3	6.5	9.9	12.5	11.5
Num													9

Note: Hydrographs in 1996 and 2001 have irregular shape and judged as unreliable value.

Table 37 Supplemented Monthly Runoff and Collected Monthly Runoff Records (33/43)

No: 33 River Basin: K. Serayu
 Station Name: Banyumas River: K. Serayu
 Station ID by HPPS2: 02-090-01-08 Catchment Area (km²): 2,632

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1970	228.1	185.1	326.9	228.1	242.5	150.8	64.7	35.4	39.6	104.6	252.8	336.5	182.9
1971	435.0	463.0	440.0	271.0	154.0	99.5	84.7	65.7	81.9	246.0	314.0	379.0	252.8
1972	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	395.0	403.0	434.0	479.0	389.0	266.0	186.0	114.0	212.0	248.0	415.0	406.0	328.9
1974	285.0	402.0	278.3	359.0	223.0	107.8	107.8	140.0	242.0	449.0	257.6	285.0	261.4
1975	-	-	-	-	-	-	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	283.0	351.0	330.0	274.0	156.0	192.0	64.5	33.8	29.9	23.0	125.0	213.0	172.9
1978	305.0	263.0	293.0	188.8	229.0	291.0	264.0	133.0	240.0	273.0	278.0	384.0	261.8
1979	394.0	346.0	324.0	374.0	427.0	159.5	59.6	82.0	80.5	127.9	286.0	371.0	252.6
1980	276.0	224.0	334.0	380.0	188.0	96.3	59.6	142.0	71.3	204.0	435.0	425.0	236.3
1981	425.0	352.0	383.0	355.0	330.0	234.0	231.0	125.6	150.0	229.0	353.0	468.0	303.0
1982	444.9	380.0	297.0	254.0	74.1	45.4	34.6	23.8	24.4	45.9	54.2	135.7	151.2
1983	342.8	274.0	184.0	183.0	243.0	116.0	43.4	30.3	29.0	140.6	337.0	342.5	188.8
1984	318.0	524.0	366.0	402.0	267.0	121.0	86.0	59.8	272.9	347.0	311.0	407.0	290.1
1985	320.0	378.0	332.8	248.0	220.5	246.0	82.5	118.8	86.3	171.0	421.0	362.0	248.9
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	466.0	555.0	364.0	252.0	164.0	111.0	60.5	52.7	50.0	122.0	245.0	473.0	242.9
1988	351.0	368.0	407.0	194.0	263.0	188.0	51.3	55.3	49.6	165.0	353.0	449.0	241.2
1989	340.0	397.0	331.0	250.0	192.0	195.0	148.0	107.0	72.1	125.0	246.0	246.0	220.8
1990	230.0	220.0	247.0	277.0	184.0	191.0	133.0	89.9	110.0	109.0	186.0	475.0	204.3
1991	576.0	527.0	349.0	360.0	148.0	65.5	94.4	125.0	158.0	115.0	230.0	399.0	262.2
1992	338.0	349.0	401.0	401.0	259.0	176.0	107.0	158.0	233.0	379.0	378.0	483.0	305.2
1993	416.0	324.0	351.0	369.0	232.0	138.0	81.0	76.0	60.8	55.5	169.0	335.0	217.3
Ave	358.4	364.3	338.7	304.9	229.3	159.5	102.2	88.4	114.7	184.0	282.3	368.7	241.3
Num													20

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	298.3	310.4	306.0	225.6	127.2	56.3	41.7	41.2	32.6	29.8	106.9	216.3	149.4
1995	345.9	533.6	376.8	264.7	271.2	200.4	169.8	92.5	76.8	155.7	373.3	245.3	258.8
1996	282.6	405.0	332.7	222.0	109.9	96.4	92.0	84.5	62.8	223.1	328.6	250.4	207.5
1997	170.1	223.3	109.4	104.2	76.4	59.7	31.2	21.0	19.9	*	*	*	-
1998	*	*	229.7	218.7	127.8	160.6	137.7	89.7	86.2	197.5	340.8	347.3	-
1999	*	*	*	*	*	*	*	*	*	*	*	*	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	209.1	211.5	259.3	228.2	128.3	129.8	65.8	45.8	54.3	194.2	284.3	142.2	162.7
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	180.3	270.0	229.0	113.0	89.6	55.9	43.9	38.3	33.6	81.9	178.4	231.6	128.8
2004	200.5	171.5	198.9	140.0	107.3	57.7	58.6	33.4	38.3	37.2	141.7	307.0	124.3
2005	200.3	157.0	139.3	176.1	90.3	72.0	65.9	46.8	70.2	147.3	147.0	244.8	129.8
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	150.3	256.4	342.6	419.8	164.8	119.8	74.4	64.0	70.1	82.3	263.5	378.2	198.9
Ave	226.4	282.1	252.4	211.2	129.3	100.9	78.1	55.7	54.5	127.7	240.5	262.6	170.0
Num													8

Note: Hydrographs in 1997, 1998 and 1999 have irregular shape and judged as unregular value.

Table 38 Supplemented Monthly Runoff and Collected Monthly Runoff Records (34/43)

No: 34 River Basin: K. Brantas
 Station Name: Kaulon River: K. Brantas
 Station ID by HPPS2: 02-057-01-08 Catchment Area (km²): 2,620

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1951	166.9	175.2	125.9	97.3	87.0	91.3	62.3	53.2	46.0	42.3	39.1	90.8	89.8
1952	155.3	193.4	169.3	109.6	84.5	62.7	54.3	45.0	39.4	53.4	128.7	110.1	100.5
1953	108.4	103.2	123.6	111.5	141.4	75.8	78.1	48.8	45.2	40.7	54.8	81.2	84.4
1954	154.8	157.2	125.2	118.4	131.2	115.1	78.1	72.0	60.3	61.8	155.0	198.6	119.0
1955	122.8	141.2	108.7	126.3	118.7	120.7	152.6	125.5	89.7	98.1	161.5	101.3	122.3
1956	166.9	143.9	119.7	93.1	99.0	99.1	95.9	80.8	61.5	63.3	80.6	114.0	101.5
1957	115.5	141.8	189.3	123.4	92.7	70.3	143.4	83.7	51.7	45.9	51.8	109.4	101.6
1958	91.2	121.3	137.5	138.3	107.9	83.8	99.7	61.8	46.2	64.6	74.8	164.6	99.3
1959	146.7	132.0	148.5	112.8	108.3	90.5	66.3	46.2	44.2	38.0	51.2	158.6	95.3
1960	135.0	118.2	140.8	141.0	141.9	92.3	83.1	52.7	42.5	38.8	82.6	85.7	96.2
1961	142.5	121.8	93.5	107.8	99.1	70.8	52.5	40.4	33.8	32.7	54.9	82.6	77.7
1962	130.2	123.8	111.9	118.9	88.4	71.8	61.4	67.9	60.6	58.0	93.2	144.8	94.2
1963	122.2	121.8	143.0	149.5	90.0	87.3	63.5	54.4	52.9	57.7	61.9	102.5	92.2
1964	104.8	117.7	150.4	121.9	144.5	124.5	87.1	73.3	72.5	172.0	144.3	118.7	119.3
1965	156.1	154.5	117.3	105.0	57.3	56.7	46.6	38.9	34.0	31.9	39.9	71.7	75.8
1966	75.1	141.4	171.5	118.0	102.6	89.7	72.6	71.3	43.5	67.7	92.6	167.8	101.2
1967	146.2	123.7	134.7	158.1	105.0	91.4	77.5	47.6	37.4	52.9	96.6	137.7	100.7
1968	192.1	112.3	113.9	106.5	129.1	93.6	81.5	62.1	54.6	66.8	86.9	121.4	101.7
1969	144.3	100.3	184.3	184.2	121.1	123.6	59.5	48.5	59.2	57.1	63.8	93.5	103.3
1970	131.3	126.0	148.4	165.7	117.3	110.1	103.2	74.4	90.0	75.8	108.0	158.2	117.4
1971	223.1	216.8	206.5	188.9	209.2	185.2	93.2	54.7	65.2	101.3	151.2	223.9	159.9
Ave	139.6	137.5	141.1	128.4	113.2	95.5	81.5	62.1	53.8	62.9	89.2	125.6	102.5
Num													21

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 39 Supplemented Monthly Runoff and Collected Monthly Runoff Records (35/43)

No: 35 River Basin: K. Bondoyudo
 Station Name: Wonorejo River: K. Bondoyudo
 Station ID by HPPS2: 02-074-01-01 Catchment Area (km2): 314

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1973	13.9	19.3	14.2	16.8	16.9	18.9	16.9	14.0	19.4	17.0	97.1	17.7	23.5
1974	16.7	29.7	21.1	20.0	16.7	14.8	13.3	13.7	13.2	24.3	21.3	23.2	19.0
1975	24.3	22.6	22.4	24.5	26.8	15.5	16.3	13.6	16.1	20.8	21.3	26.5	20.9
1976	25.3	26.7	26.0	19.9	17.1	17.7	14.7	13.4	13.6	9.3	12.9	12.0	17.4
1977	16.8	15.7	20.4	20.4	15.6	14.6	13.2	12.6	12.0	11.5	11.5	11.5	14.7
1978	16.1	15.9	21.5	17.2	15.0	24.4	17.0	14.2	16.2	21.1	21.7	26.7	18.9
1979	21.0	19.7	17.3	20.0	16.1	23.2	16.6	15.8	13.0	15.4	17.3	19.2	17.9
1980	23.6	20.4	19.2	20.2	16.6	13.9	13.5	15.1	13.9	15.8	14.0	21.4	17.3
1981	15.3	15.7	16.1	17.2	17.5	14.8	15.8	12.3	14.0	13.8	13.9	17.8	15.4
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	19.1	15.8	13.1	12.8	14.0	14.8	14.1	13.5	13.2	14.1	16.1	16.9	14.8
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	19.4	17.6	18.0	16.6	16.1	15.3	14.4	14.0	13.9	14.1	14.8	15.6	15.8
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
1990	23.4	20.9	18.7	18.0	16.4	15.4	14.4	13.9	13.6	13.5	13.8	14.7	16.4
1991	12.7	13.0	7.4	6.4	6.2	5.4	5.2	5.3	5.1	4.7	18.6	20.8	9.2
1992	17.0	18.0	16.9	8.0	11.4	13.4	19.8	11.7	14.7	23.6	21.9	23.9	16.7
1993	16.5	17.0	19.6	18.1	14.8	16.0	12.0	13.6	14.5	16.8	15.3	19.3	16.1
Ave	18.7	19.2	18.1	17.1	15.8	15.9	14.5	13.1	13.8	15.7	22.1	19.1	16.9
Num													15

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1994	20.5	21.5	27.5	17.9	15.6	14.7	14.3	14.7	14.6	13.9	13.8	15.0	17.0
1995	21.3	31.3	27.2	22.1	16.1	15.5	15.1	12.7	12.2	14.7	22.7	20.1	19.3
1996	23.9	21.5	24.1	21.8	16.0	14.3	13.8	14.4	12.0	14.6	24.4	19.3	18.4
1997	18.8	18.3	11.0	14.2	10.9	10.9	10.5	10.6	10.4	10.7	10.3	11.3	12.3
1998	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	18.8	33.9	22.7	47.1	21.7	17.5	15.8	14.4	13.3	17.3	17.8	21.6	21.8
2000	30.0	25.1	21.0	23.8	21.6	14.6	12.2	11.2	12.1	23.5	30.4	22.0	20.6
2001	26.7	42.2	46.7	23.8	15.9	16.7	15.1	13.0	10.7	14.3	17.8	14.8	21.5
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	20.2	20.7	21.9	24.7	18.2	14.3	13.1	11.7	10.6	9.6	9.4	11.0	15.5
2007	10.3	13.2	22.7	19.6	14.5	13.8	11.2	10.1	10.2	9.6	10.9	15.7	13.5
Ave	21.2	25.3	25.0	23.9	16.7	14.7	13.5	12.6	11.8	14.2	17.5	16.8	17.8
Num													9

Table 40 Supplemented Monthly Runoff and Collected Monthly Runoff Records (36/43)

No: 36 River Basin: S. Werba
 Station Name: PLTM Werba intakesite River: S. Werba
 Station ID by HPPS2: - Catchment Area (km2): 65

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1980	1.53	1.15	2.24	2.85	3.56	2.31	2.66	4.89	2.17	2.41	1.69	1.51	2.41
1981	3.27	2.90	2.21	2.35	2.89	3.04	4.81	4.35	5.13	5.88	5.54	6.65	4.09
1982	3.86	4.85	5.59	5.53	5.17	2.43	1.98	2.22	1.25	3.88	1.31	0.80	3.24
1983	0.62	7.62	6.45	3.12	5.12	5.50	3.89	3.38	8.15	14.47	5.95	4.29	5.71
1984	5.23	4.02	5.27	6.36	6.74	10.86	14.82	14.27	10.31	8.48	5.61	5.77	8.15
1985	5.11	4.46	2.40	2.49	3.96	8.37	9.79	9.55	9.27	3.27	4.84	4.50	5.67
1986	2.57	2.31	11.17	5.19	3.13	3.31	2.34	3.23	3.86	6.17	3.20	2.64	4.09
1987	2.99	1.70	2.16	1.20	2.13	1.32	0.78	0.54	2.33	5.75	2.28	2.28	2.12
1988	2.38	2.89	2.32	1.81	1.81	3.98	5.20	4.64	5.82	3.95	2.75	2.89	3.37
1989	2.20	2.13	2.40	1.79	1.43	5.28	7.49	12.53	6.30	5.33	3.60	3.89	4.53
1990	4.27	2.76	4.05	2.29	4.91	7.82	6.97	4.99	4.80	4.94	3.22	3.18	4.52
Ave	3.09	3.34	4.21	3.18	3.71	4.93	5.52	5.87	5.40	5.87	3.64	3.49	4.35
Num													11

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 41 Supplemented Monthly Runoff and Collected Monthly Runoff Records (37/43)

No: 37 River Basin: S. Warsamson
 Station Name: PLTA Warsamson damsite River: S. Warsamson
 Station ID by HPPS2: - Catchment Area (km2): 1,460

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1959	56.0	16.0	29.0	91.0	141.0	150.0	117.0	49.0	52.0	72.0	69.0	47.0	74.1
1960	83.0	47.0	27.0	54.0	86.0	63.0	237.0	31.0	54.0	25.0	59.0	49.0	67.9
1961	34.0	62.0	59.0	55.0	39.0	75.0	95.0	31.0	40.0	18.0	41.0	46.0	49.6
1962	113.0	63.0	35.0	108.0	110.0	93.0	41.0	102.0	38.0	74.0	36.0	63.0	73.0
1963	76.0	72.0	50.0	72.0	150.0	68.0	84.0	37.0	9.0	9.0	23.0	65.0	59.6
1964	31.0	83.0	35.0	121.0	62.0	87.0	73.0	40.0	32.0	50.0	46.0	84.0	62.0
1965	76.0	8.0	40.0	85.0	80.0	90.0	6.0	10.0	15.0	36.0	72.0	60.0	48.2
1966	35.0	43.0	38.0	39.0	83.0	73.0	53.0	114.0	62.0	39.0	69.0	62.0	59.2
1967	91.0	45.0	22.0	76.0	109.0	84.0	96.0	28.0	15.0	47.0	36.0	31.0	56.7
1968	36.0	18.0	97.0	29.0	46.0	128.0	95.0	56.0	93.0	68.0	106.0	74.0	70.5
1969	38.0	15.0	112.0	52.0	158.0	68.0	132.0	85.0	28.0	95.0	73.0	45.0	75.1
1970	53.0	38.0	66.0	77.0	159.0	60.0	126.0	96.0	68.0	34.0	56.0	71.0	75.3
1971	58.0	61.0	38.0	54.0	131.0	117.0	80.0	119.0	89.0	93.0	55.0	31.0	77.2
1972	45.0	81.0	37.0	47.0	46.0	144.0	19.0	41.0	29.0	9.0	43.0	26.0	47.3
1973	80.0	33.0	63.0	140.0	97.0	93.0	65.0	100.0	68.0	44.0	23.0	13.0	68.3
1974	14.0	92.0	27.0	106.0	119.0	87.0	70.0	61.0	80.0	57.0	51.0	47.0	67.6
1975	43.0	33.0	37.0	78.0	97.0	88.0	63.0	78.0	97.0	39.0	36.0	68.0	63.1
1976	30.0	63.0	29.0	48.0	88.0	35.0	47.0	53.0	35.0	87.0	48.0	10.0	47.8
1977	33.0	56.0	71.0	79.0	79.0	130.0	38.0	49.0	46.0	60.0	44.0	47.0	61.0
1978	72.0	15.0	144.0	35.0	40.0	91.0	111.0	84.0	82.0	29.0	58.0	74.0	69.6
1979	15.0	28.0	68.0	78.0	56.0	147.0	26.0	19.0	143.0	20.0	70.0	50.0	60.0
1980	41.0	41.0	25.0	66.0	75.0	60.0	29.0	52.0	5.0	44.0	37.0	23.0	41.5
1981	45.0	29.0	62.0	49.0	111.0	32.0	119.0	10.0	84.0	12.0	43.0	49.0	53.8
1982	38.0	35.0	74.0	55.0	91.0	73.0	83.1	64.6	82.0	13.0	25.0	51.0	57.1
1983	68.0	10.0	21.0	52.0	134.0	118.0	114.0	144.0	147.0	122.0	41.0	51.0	85.2
1984	62.0	75.0	59.0	109.0	194.0	105.0	201.0	62.0	162.0	29.0	35.0	42.0	94.6
1985	38.0	105.0	17.0	42.0	149.0	99.0	66.0	79.0	95.0	70.0	66.0	55.0	73.4
1986	26.0	46.0	44.0	40.0	41.0	64.0	63.0	15.0	75.0	59.0	32.0	50.0	46.3
1987	38.0	5.0	60.0	30.0	90.0	42.0	10.0	36.0	16.0	89.0	53.0	25.0	41.2
1988	55.0	38.0	56.0	25.0	91.0	90.0	134.0	191.0	92.0	75.0	65.0	66.0	81.5
Ave	50.8	45.2	51.4	66.4	98.4	88.5	83.1	64.6	64.4	50.6	50.4	49.2	63.6
Num													30

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 42 Supplemented Monthly Runoff and Collected Monthly Runoff Records (38/43)

No: 38 River Basin: S. Sermo
 Station Name: PLTA Genyem damsite River: S. Sermo
 Station ID by HPPS2: - Catchment Area (km2): 491

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1976	17.5	21.0	20.8	19.6	14.2	11.0	8.0	7.1	5.7	7.8	10.1	17.0	13.3
1977	18.0	19.0	27.5	35.9	28.1	23.7	17.5	13.9	11.8	10.9	10.9	14.5	19.3
1978	22.3	32.9	25.8	26.2	19.0	14.7	10.7	8.3	6.5	8.8	11.6	16.6	17.0
1979	16.5	22.5	28.6	25.5	20.9	16.2	15.2	12.9	10.0	16.7	16.9	19.7	18.5
1980	28.3	39.3	34.9	29.5	29.3	30.0	21.9	21.7	17.9	15.6	16.5	15.8	25.1
1981	17.4	27.6	24.2	31.3	22.7	18.0	13.0	9.8	9.0	8.8	9.3	13.3	17.0
1982	21.7	25.8	26.8	26.7	23.4	22.0	17.0	14.3	11.5	9.8	14.1	12.2	18.8
1983	14.2	18.3	18.7	16.1	16.1	16.2	11.7	9.0	9.1	11.7	10.4	14.2	13.8
1984	10.7	9.3	11.3	8.9	8.8	9.6	8.5	6.9	5.8	5.1	6.1	14.4	8.8
1985	16.1	19.6	24.3	22.1	18.9	16.5	15.7	11.8	16.2	14.0	16.0	21.7	17.7
1986	24.4	23.6	20.1	24.2	20.0	21.3	15.9	12.2	9.4	6.8	5.3	13.1	16.4
1987	17.9	18.0	15.1	18.1	13.1	10.6	8.4	6.3	9.2	6.6	6.4	5.5	11.3
1988	8.1	13.5	15.6	27.7	28.9	22.4	16.3	14.4	11.1	9.6	10.6	10.9	15.8
1989	14.8	28.7	22.9	38.8	31.1	24.1	17.5	13.9	11.9	10.9	9.4	19.0	20.3
1990	22.4	22.9	20.9	25.0	19.1	14.8	10.7	9.3	7.5	6.7	5.2	10.8	14.6
1991	17.7	20.4	22.0	17.8	15.8	16.0	14.9	12.3	13.2	10.8	10.3	12.7	15.3
1992	17.0	24.1	21.9	21.2	18.0	15.1	11.0	10.0	7.7	10.8	12.5	14.7	15.3
Ave	17.9	22.7	22.4	24.4	20.4	17.8	13.8	11.4	10.2	10.1	10.7	14.5	16.4
Num													17

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 43 Supplemented Monthly Runoff and Collected Monthly Runoff Records (39/43)

No: 39 River Basin: Tk. Ayung
 Station Name: Buangga River: Tk. Ayung
 Station ID by HPPS2: 07-022-01-01 Catchment Area (km2): 206

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1973	11.1	11.3	13.0	12.1	11.4	9.2	8.2	7.9	9.5	9.2	10.4	10.7	10.3
1974	13.3	13.5	15.4	15.2	12.6	9.8	9.1	9.5	8.9	11.7	10.6	10.1	11.6
1975	10.2	13.3	15.1	16.0	14.1	10.6	9.6	9.6	10.2	11.0	12.2	11.2	11.9
1976	13.7	11.6	12.4	11.2	11.0	9.2	8.4	8.2	7.9	8.8	9.3	8.4	10.0
1977	9.3	10.2	11.3	9.9	8.0	7.9	6.3	7.3	6.8	6.8	8.3	8.9	8.4
1978	9.1	15.3	16.0	10.0	9.4	15.5	11.0	9.9	10.4	10.3	10.7	14.1	11.8
1979	13.4	14.7	15.1	13.5	14.1	13.2	13.1	10.7	8.4	7.8	8.4	9.5	11.8
1980	9.3	8.1	8.6	8.8	7.8	7.0	6.7	7.3	7.3	5.8	6.5	8.5	7.6
1981	9.7	8.9	9.3	8.5	7.7	7.2	7.5	6.5	6.1	6.9	9.0	9.1	8.0
1982	12.5	9.7	11.6	10.2	7.6	7.6	6.5	7.5	7.2	7.4	7.8	8.7	8.7
1983	12.3	11.8	13.1	8.8	8.5	8.9	8.7	6.9	6.6	7.3	8.7	10.4	9.3
1984	13.0	13.6	13.2	16.3	11.6	7.6	7.4	8.0	11.5	9.0	7.5	7.8	10.5
1985	7.4	15.5	10.1	8.6	8.2	7.7	6.2	6.3	6.2	7.1	7.5	8.1	8.2
1986	8.9	10.5	9.8	11.1	7.1	7.6	7.9	6.5	5.7	6.0	6.9	9.2	8.1
Ave	10.9	12.0	12.4	11.4	9.9	9.2	8.3	8.0	8.1	8.2	8.8	9.6	9.8
Num													14

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 44 Supplemented Monthly Runoff and Collected Monthly Runoff Records (40/43)

No: 40 River Basin: K. Sidutan
 Station Name: Santong River: K. Sidutan
 Station ID by HPPS2: 08-005-01-01 Catchment Area (km2): 37

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1981	5.50	4.30	3.70	3.10	2.60	2.30	1.80	1.50	1.20	1.20	1.30	1.20	2.48
1982	2.10	2.30	2.40	2.00	1.70	1.40	1.10	1.00	0.80	0.70	0.70	0.80	1.42
1983	1.70	1.50	1.70	1.30	1.40	1.10	0.90	0.80	0.80	0.80	1.20	1.00	1.18
1984	1.60	3.10	2.20	1.90	1.60	1.30	1.10	1.00	1.00	0.90	0.90	1.00	1.47
1985	1.10	1.90	1.90	1.30	1.10	1.00	0.90	0.80	0.80	0.80	0.80	0.80	1.10
1986	2.70	2.10	1.40	1.60	1.40	1.20	1.00	0.90	1.00	0.80	0.80	0.90	1.32
1987	2.20	2.10	1.80	1.60	1.50	1.30	1.20	1.10	1.10	1.00	1.00	1.70	1.47
1988	1.50	1.70	2.80	2.30	1.80	1.60	1.40	1.30	1.20	1.10	1.10	2.10	1.66
1989	0.90	1.60	1.60	1.40	1.30	1.10	0.90	0.80	0.70	0.70	0.70	0.80	1.04
1990	3.20	1.60	3.00	1.90	1.60	1.20	1.10	0.90	0.80	0.80	0.70	0.90	1.48
1991	2.40	5.30	3.40	3.00	2.50	1.80	1.30	1.10	0.90	0.70	0.80	0.70	1.99
1992	1.60	2.70	2.50	4.80	0.90	1.10	1.10	1.10	0.90	0.90	0.90	0.80	1.61
1993	1.70	3.50	1.50	1.50	1.30	1.30	1.20	1.10	1.00	0.90	1.10	1.30	1.45
1994	1.20	1.90	6.70	7.50	1.90	1.00	0.80	0.70	0.60	0.70	0.90	1.40	2.11
1995	1.10	1.80	1.50	1.40	1.10	1.00	0.80	0.70	0.60	0.60	0.70	0.80	1.01
Ave	2.03	2.49	2.54	2.44	1.58	1.31	1.11	0.99	0.89	0.84	0.91	1.08	1.52
Num													15

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1996	1.48	2.02	2.34	1.74	0.84	0.63	0.70	1.12	1.18	0.98	0.97	1.46	1.29
1997	2.45	2.90	1.86	1.45	0.93	0.55	0.59	0.97	1.38	1.36	1.23	1.27	1.41
1998	1.42	1.97	1.55	1.72	1.39	1.15	1.21	1.08	1.04	1.20	1.33	1.22	1.36
1999	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	1.98	2.69	2.90	2.14	1.85	1.64	1.38	1.23	1.22	1.15	1.20	1.43	1.73
2004	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	3.81	3.33	3.80	3.37	3.53	3.17	2.59	2.26	2.08	1.84	1.73	1.97	2.79
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	1.52	4.53	2.51	1.99	1.70	1.44	1.30	1.20	1.20	1.08	1.24	1.15	1.74
Ave	2.11	2.91	2.49	2.07	1.71	1.43	1.29	1.31	1.35	1.27	1.28	1.42	1.72
Num													6

Table 45 Supplemented Monthly Runoff and Collected Monthly Runoff Records (41/43)

No: 41 River Basin: A. Ira
 Station Name: PLTM Ira intakesite River: A. Ira
 Station ID by HPPS2: - Catchment Area (km2): 118

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1984	4.54	4.35	4.04	2.20	1.90	2.97	0.81	0.44	4.83	3.35	1.96	6.67	3.17
1985	4.51	4.34	1.21	0.56	6.31	5.89	3.99	4.10	3.60	3.98	6.14	5.07	4.14
1986	2.75	1.83	3.71	1.85	6.65	6.02	4.04	1.15	2.29	0.68	4.96	1.92	3.15
1987	5.24	6.65	2.35	2.61	4.62	9.35	3.54	4.48	3.11	4.61	1.18	11.78	4.96
1988	7.31	6.39	5.89	1.68	8.35	5.15	9.05	11.74	3.33	3.60	2.73	9.44	6.22
1989	9.29	3.16	8.11	2.07	5.05	7.54	9.66	5.44	5.05	1.95	6.89	10.64	6.24
1990	8.09	2.38	4.97	5.28	3.68	2.75	2.60	3.74	4.02	1.27	5.97	6.50	4.27
1991	7.43	5.12	2.48	3.86	3.93	3.17	1.64	0.57	0.44	2.06	6.93	2.95	3.38
1992	3.34	4.04	2.92	4.09	7.18	3.03	5.03	1.53	2.56	0.56	0.32	3.62	3.18
1993	1.34	0.68	1.45	0.49	0.26	2.55	3.86	3.40	3.42	2.45	4.12	6.51	2.54
Ave	5.39	3.89	3.71	2.47	4.79	4.84	4.42	3.66	3.26	2.45	4.12	6.51	4.13
Num													10

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 46 Supplemented Monthly Runoff and Collected Monthly Runoff Records (42/43)

No: 42 River Basin: Wai Isal
 Station Name: PLTA Isal-2 damsite River: Wai Isal
 Station ID by HPPS2: - Catchment Area (km2): 242

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1930	18.2	23.5	26.4	22.1	20.4	16.7	5.4	4.2	5.5	11.9	13.7	22.6	15.9
1931	17.3	29.2	23.5	26.4	20.9	19.8	9.4	9.1	13.8	17.0	20.1	22.3	19.1
1932	15.0	19.5	13.2	23.4	21.2	15.3	4.1	5.4	6.7	16.1	10.4	16.7	13.9
1933	22.7	11.0	19.0	18.4	18.6	15.6	10.9	16.4	20.5	20.9	16.0	19.4	17.5
1934	18.0	19.4	24.0	23.4	19.0	16.4	11.5	26.3	13.0	13.9	11.1	19.1	17.9
1935	15.5	21.6	15.2	24.8	17.4	13.0	10.0	9.9	5.5	18.5	20.7	11.9	15.3
1936	22.7	14.7	20.3	25.9	21.7	20.5	22.7	11.9	11.9	8.8	17.2	21.0	18.3
1937	18.4	19.7	12.0	26.8	22.6	25.6	24.4	12.6	16.9	16.1	11.8	11.9	18.2
1938	23.3	17.6	14.8	10.5	17.6	8.4	19.8	17.6	17.7	13.0	17.0	15.6	16.1
1939	14.8	14.3	13.2	19.5	24.2	15.4	18.2	3.7	8.0	12.9	7.3	15.6	13.9
Ave	18.6	19.1	18.2	22.1	20.4	16.7	13.6	11.7	12.0	14.9	14.5	17.6	16.6
Num													10

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 47 Supplemented Monthly Runoff and Collected Monthly Runoff Records (43/43)

No: 43 River Basin: Ira Siquiro
 Station Name: PLTA Ira Lalaro damsite River: Ira Siquiro
 Station ID by HPPS2: - Catchment Area (km²): 406

Supplemented Monthly Runoff in HPPS2													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1953	6.5	9.2	11.8	11.3	14.6	12.6	13.9	14.4	5.8	5.9	5.3	8.3	10.0
1954	9.0	11.0	15.3	11.7	12.1	17.2	21.2	25.7	28.9	14.2	7.0	7.4	15.1
1955	10.1	11.3	9.8	12.6	9.6	14.5	15.8	13.8	18.4	7.1	8.1	5.4	11.4
1956	5.7	7.6	10.3	8.1	8.9	7.3	7.7	7.8	6.6	6.6	4.2	6.8	7.3
1957	8.6	11.9	14.8	12.3	12.2	10.9	11.8	12.1	8.4	4.8	4.7	5.7	9.9
1958	7.3	9.5	11.0	12.1	13.4	12.9	14.9	13.7	7.7	4.9	3.8	4.9	9.7
1959	5.5	7.3	10.5	11.6	15.6	14.7	15.9	14.6	5.8	5.3	4.1	5.3	9.7
1960	6.5	9.9	11.1	11.7	12.3	8.1	8.3	6.0	4.3	4.1	4.4	5.2	7.7
1961	7.5	9.8	12.3	14.0	15.2	18.1	13.2	15.0	15.8	5.3	5.5	6.2	11.5
1962	7.7	11.1	11.7	11.5	12.2	12.2	9.0	6.3	4.5	3.9	3.7	4.2	8.2
1963	5.7	6.6	9.4	10.5	11.2	12.3	11.6	13.4	8.3	5.4	7.0	8.0	9.1
1964	11.7	12.1	10.0	12.7	8.8	9.8	9.2	8.0	6.7	4.2	3.4	4.4	8.4
1965	6.6	7.8	10.8	12.2	9.2	9.6	8.5	8.7	8.6	4.4	4.5	5.2	8.0
1966	6.9	8.8	12.7	12.2	11.2	12.5	8.0	7.1	5.7	4.5	4.2	5.2	8.3
1967	6.9	8.3	11.8	11.4	12.0	13.4	17.0	20.3	16.2	12.7	3.8	5.1	11.6
1968	6.5	7.6	11.2	9.5	7.9	8.8	7.5	8.6	8.1	6.0	4.2	6.1	7.7
1969	6.7	8.5	12.6	9.3	12.0	12.5	14.2	15.5	9.2	5.5	5.0	7.4	9.9
1970	7.8	8.4	10.9	9.5	8.8	10.7	10.3	10.1	6.4	6.1	5.8	6.7	8.5
1971	7.8	10.6	11.1	12.5	13.6	15.0	10.9	9.0	6.3	4.0	3.4	4.8	9.1
1972	6.3	7.6	11.2	12.2	11.7	12.3	12.8	12.2	8.9	7.2	7.8	8.6	9.9
1973	7.0	9.9	9.1	9.0	10.8	9.1	10.0	7.5	7.8	6.1	5.0	6.0	8.1
Ave	7.3	9.3	11.4	11.3	11.6	12.1	12.0	11.9	9.4	6.1	5.0	6.0	9.5
Num													21

Collected Monthly Runoff													Unit:m3/s
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-	-	-	-	-
Num													0

Table 48 Weighted Annual Mean Runoff and Rate of Change

Region	No.	Station Name	Supplemented Annual Mean Runoff in HPPS2		Collected Annual Mean Runoff		Weighted Annual Mean Runoff	
			Runoff (m3/s)	Number of Years	Runoff (m3/s)	Number of Years	Runoff (m3/s)	Rate of Change (%)
Sumatra	1	Lhok Nibong	175.7	21	241.2	3	183.9	4.7%
	2	Stabat	201.7	22	184.2	5	198.5	-1.6%
	3	Lb. Sipelanduk	28.4	20	-	0	28.4	0.0%
	4	Lb. Bendahara	141.5	19	120.0	5	137.0	-3.2%
	5	Tj. Ampalu	77.6	18	57.5	5	73.2	-5.6%
	6	Sungai Dareh	310.2	18	247.4	6	294.5	-5.1%
	7	Muara Inum	107.6	17	-	0	107.6	0.0%
	8	Martapura	225.0	25	183.3	2	221.9	-1.4%
	9	Banjarmasin	36.8	22	40.1	6	37.5	1.9%
	10	Kunyir	23.1	26	17.4	4	22.3	-3.3%
	11	Kp. Darang	33.1	16	31.1	3	32.8	-0.9%
	12	Tui Kareng	183.9	11	212.7	3	190.1	3.4%
	13	Hp. Baru	128.9	21	80.9	4	121.3	-6.0%
	14	Air Batu	31.3	20	41.7	6	33.7	7.7%
	15	Air Gadang	121.3	20	100.1	5	117.1	-3.5%
	16	Despetah	45.2	18	-	0	45.2	0.0%
Kalimantan	17	Silat dams site	73.7	15	-	0	73.7	0.0%
	18	Kelai-2 dams site	293.6	16	-	0	293.6	0.0%
	19	Sei Langsat	60.3	20	-	0	60.3	0.0%
	20	Panaan	45.6	27	26.3	5	42.6	-6.6%
Sulawesi	21	Tulabolo	60.6	9	-	0	60.6	0.0%
	22	Tincep	3.2	18	-	0	3.2	0.0%
	23	Palili	21.2	15	-	0	21.2	0.0%
	24	Gillirang	8.2	15	12.5	3	8.9	8.7%
	25	Bila	15.7	15	18.8	4	16.4	4.1%
	26	Likupande	15.5	12	11.3	8	13.9	-10.8%
	27	Bakaru	69.1	19	-	0	69.1	0.0%
Jawa	28	Kebon Randu	29.6	27	-	0	29.6	0.0%
	29	Cibuni-3 dams site	78.0	30	-	0	78.0	0.0%
	30	Rangkasbitung	94.3	24	63.6	6	88.1	-6.5%
	31	Leui Goong	30.0	30	30.5	4	30.0	0.2%
	32	Krangan-2	17.0	24	11.5	9	15.5	-8.8%
	33	Banyumas	241.3	20	170.0	8	220.9	-8.4%
	34	Kaulon	102.5	21	-	0	102.5	0.0%
	35	Wonorejo	16.9	15	17.8	9	17.2	1.8%
	Irian Jaya	36	PLTM Werba	4.4	11	-	0	4.4
37		PLTA Warsamson	63.6	30	-	0	63.6	0.0%
38		PLTA Genyem	16.4	17	-	0	16.4	0.0%
Bali	39	Buangga	9.8	14	-	0	9.8	0.0%
Lombok	40	Santong	1.5	15	1.7	6	1.6	3.8%
Halmahera	41	PLTM Ira	4.1	10	-	0	4.1	0.0%
Seram	42	PLTA Isal-2	16.6	10	-	0	16.6	0.0%
Timor	43	PLTA Ira Lalaro	9.5	21	-	0	9.5	0.0%

Table 49 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (1/8)

No: 19 River Basin: S. Martapura
 Station Name: Sei Langsat (Riam Kiwa damsite) River: S. Riam Kiwa
 Station ID by HPPS2: 03-026-01-01 Catchment Area (km²): 1,420

Basin Mean Rainfall in HPPS2										Unit:mm
Year	Rainfall Station									Basin Mean Rainfall
	Lumpang Kiri	Rantau	Lampinit	Tatakan	Atayo	Ulin	Lawa-Lawa	Binuang	Pengaron	
1965	-	2,103	-	-	-	2,416	-	-	-	2,260
1966	-	2,920	-	-	1,962	2,286	2,685	-	1,952	2,361
1967	-	2,586	-	-	2,442	2,084	2,160	-	1,384	2,131
1968	-	3,249	-	-	3,555	2,323	2,680	-	2,169	2,795
1969	-	3,080	-	-	2,847	2,356	-	-	1,426	2,427
1970	-	4,018	-	-	3,510	2,804	-	-	-	3,444
1971	-	2,796	-	-	3,030	1,801	2,713	-	-	2,585
1972	-	2,207	-	-	2,073	-	1,489	-	-	1,923
1973	-	2,536	-	-	3,559	1,374	2,953	-	-	2,606
1974	-	2,693	-	-	2,552	1,132	2,095	-	-	2,118
1975	-	2,571	-	-	3,199	1,439	2,453	3,178	-	2,568
1976	-	2,353	-	-	2,374	1,166	1,471	2,391	1,477	1,872
1977	2,743	1,821	1,565	2,038	-	-	2,196	1,615	1,750	1,961
1978	2,544	2,271	3,330	2,997	2,197	-	2,929	2,839	2,037	2,643
1979	3,406	2,446	4,356	2,480	2,051	2,287	2,399	2,654	1,924	2,667
1980	1,828	2,248	4,810	1,881	-	-	-	2,199	2,237	2,534
1981	2,200	2,452	3,586	1,973	3,704	-	2,368	2,073	2,529	2,611
1982	1,145	2,058	3,728	2,064	-	-	-	1,684	1,996	2,113
1983	1,820	2,153	3,836	1,674	-	-	-	1,972	2,135	2,265
1984	4,318	1,802	4,151	1,807	-	-	-	1,906	2,733	2,786
Ave	2,501	2,518	3,670	2,114	2,790	1,956	2,353	2,251	1,981	2,433
Num	8	20	8	8	14	12	13	10	13	20
Collected Rainfall in the Study										
1986	-	-	-	-	-	2,529	2,622	3,034	-	2,728
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	2,182	2,583	2,997	2,587
Ave	-	-	-	-	-	2,529	2,402	2,809	2,997	2,658
Num	0	0	0	0	0	1	2	2	1	2
Change	-	-	-	-	-	2.3%	0.3%	4.1%	3.7%	2.6%

Table 50 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (2/8)

No: 22 River Basin: S. Munte
 Station Name: Tincep River: S. Munte
 Station ID by HPPS2: 04-127-01-01 Catchment Area (km²): 54.4

Basin Mean Rainfall in HPPS2 Unit:mm

Year	Rainfall Station				Basin Mean Rainfall
	Tondano (336)	Tomohon (338)	Noongan (339A)	Tanawangko (341)	
1924	2,319	4,678	-	-	3,499
1925	1,784	1,765	3,115	6,609	3,318
1926	2,046	2,317	2,689	7,804	3,714
1927	2,134	2,110	2,335	6,312	3,223
1928	1,820	2,557	2,484	7,694	3,639
1929	-	2,251	2,803	3,985	3,013
1930	1,744	1,984	2,485	2,910	2,281
1931	2,383	1,229	3,362	3,518	2,623
1932	2,331	2,469	3,236	3,983	3,005
1933	-	2,296	3,397	4,002	3,232
1934	2,454	2,282	4,062	4,135	3,233
1935	2,274	2,949	3,892	4,079	3,299
1936	2,296	2,585	3,091	3,842	2,954
1937	1,939	2,246	3,013	3,943	2,785
1938	1,934	-	2,706	4,868	3,169
1939	1,980	-	2,667	3,554	2,734
1940	1,790	2,097	2,402	2,930	2,305
1941	-	-	2,372	2,476	2,424
Ave	2,082	2,388	2,948	4,508	3,025
Num	15	15	17	17	18

Collected Rainfall in the Study

1951	-	-	-	3,825	3,825
1952	-	-	-	3,669	3,669
1953	-	-	-	-	-
1954	1,827	-	2,886	4,730	3,148
1955	2,459	-	2,681	4,338	3,159
1956	-	-	3,178	-	3,178
1957	-	-	1,870	2,931	2,401
1958	-	-	-	-	-
1959	-	-	-	-	-
1960	-	-	-	-	-
1961	-	-	2,749	-	2,749
1962	-	-	-	-	-
1963	-	-	-	-	-
1964	-	-	-	-	-
1965	-	-	2,533	-	2,533
1966	-	-	-	-	-
1967	-	-	-	-	-
1968	-	-	-	-	-
1969	-	-	-	-	-
1970	-	-	-	-	-
1971	-	-	-	-	-
1972	-	-	-	-	-
1973	-	-	-	-	-
1974	-	-	442	-	442
1975	-	-	1,569	-	1,569
Ave	2,143	-	2,239	3,899	2,667
Num	2	0	8	5	10
Change	0.3%	-	-7.7%	-3.1%	-3.5%

Table 51 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (3/8)

No: 23 River Basin: S. Palu
 Station Name: Palili River: S. Lindu
 Station ID by HPPS2: 04-112-02-02 Catchment Area (km²): 593

Basin Mean Rainfall in HPPS2							Unit:mm
Year	Rainfall Station						Basin Mean Rainfall
	Donggala (363)	Parigi (365)	Poso (385)	Lembasida (363G)	Una-Una (366)	Bila (399G)	
1972	1,302	1,704	-	-	2,243	-	1,750
1973	1,772	1,646	-	2,313	3,673	-	2,351
1974	1,505	1,643	-	-	2,682	-	1,943
1975	1,365	-	-	1,983	4,440	-	2,596
1976	1,068	-	-	1,628	3,648	-	2,115
1977	1,263	-	2,120	1,623	3,049	-	2,014
1978	1,685	1,724	2,620	-	5,159	-	2,797
1979	1,780	2,099	2,626	-	3,602	-	2,527
1980	1,609	1,963	2,144	-	3,407	-	2,281
1981	-	1,567	1,944	-	-	2,696	2,069
1982	-	1,791	1,505	-	-	1,659	1,652
1983	-	1,822	1,937	-	-	1,948	1,902
1984	-	-	-	-	-	2,862	2,862
1985	-	-	-	-	-	1,980	1,980
1986	-	-	-	-	-	2,599	2,599
Ave	1,483	1,773	2,128	1,887	3,545	2,291	2,229
Num	9	9	7	4	9	6	15

Collected Rainfall in the Study							
1989	-	-	2,658	-	-	-	2,658
1990	-	-	2,649	-	-	-	2,649
1991	-	-	2,028	-	-	-	2,028
1992	-	-	-	-	-	-	-
1993	-	-	1,828	-	-	-	1,828
1994	-	-	2,095	-	-	-	2,095
1995	-	-	3,506	-	-	-	3,506
1996	-	-	-	-	-	-	-
1997	-	-	1,667	-	-	-	1,667
1998	-	-	2,540	-	-	-	2,540
1999	-	-	-	-	-	-	-
2000	-	-	1,433	-	-	-	1,433
2001	-	-	1,655	-	-	-	1,655
Ave	-	-	2,206	-	-	-	2,206
Num	0	0	10	0	0	0	10
Change	-	-	2.2%	-	-	-	2.2%

Table 52 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (4/8)

No: 28
 Station Name: Kebon Randu
 Station ID by HPPS2: 02-107-06-01

River Basin: Cimandiri
 River: Cicatih
 Catchment Area (km2): 486

Basin Mean Rainfall in HPPS2									Unit:mm
Year	Rainfall Station								Basin Mean Rainfall
	Sukabumi (57)	Cikidang (10)	Tjipetir	Sukamaju (12)	Cikembang (45)	Cibinar (36)	Ubrug (45A)	Ciburayut (61)	
1966	-	2,234	2,623	2,168	-	-	3,099	3,737	2,772
1967	-	-	-	-	-	-	2,805	2,946	2,876
1968	-	2,922	-	4,422	-	-	3,278	4,894	3,879
1969	-	1,850	2,282	2,943	-	-	2,726	5,956	3,151
1970	1,645	3,023	3,219	3,446	-	-	3,119	-	2,890
1971	2,722	2,540	2,962	2,205	-	-	2,371	4,696	2,916
1972	1,909	-	-	2,369	3,202	-	2,106	4,057	2,729
1973	2,847	3,358	3,970	3,243	4,388	-	3,290	4,331	3,632
1974	4,206	3,231	-	3,245	2,755	-	3,137	3,484	3,343
1975	5,200	2,401	2,973	2,683	2,933	-	3,000	4,358	3,364
1976	4,597	2,241	2,578	2,344	2,283	-	2,197	2,976	2,745
1977	4,192	-	2,999	2,254	2,989	-	-	4,133	3,313
1978	5,867	2,371	-	3,253	3,332	-	3,555	4,015	3,732
1979	-	3,143	3,540	2,868	5,006	3,742	3,211	2,976	3,498
1980	-	-	2,951	2,391	5,264	-	-	3,588	3,549
1981	-	3,405	3,804	3,188	5,028	3,827	3,457	-	3,785
1982	-	1,825	3,014	-	3,250	3,052	-	-	2,785
1983	-	-	2,616	-	3,235	2,434	-	-	2,762
1984	-	3,135	3,847	-	3,784	3,548	-	-	3,579
1985	-	-	-	-	3,804	3,037	-	-	3,421
1986	-	-	4,155	-	3,104	-	-	-	3,630
1987	-	-	-	3,309	-	-	-	-	3,309
1988	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-
Ave	3,687	2,691	3,169	2,896	3,624	3,273	2,954	4,011	3,257
Num	9	14	15	16	15	6	14	14	22
Collected Rainfall in the Study									
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
Ave	-	-	-	-	-	-	-	-	-
Num	0	0	0	0	0	0	0	0	0
Change	-	-	-	-	-	-	-	-	-

Table 53 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (5/8)

No: 29 River Basin: Cibuni
 Station Name: Cibuni-3 damsite River: Cibuni
 Station ID by HPPS2: - Catchment Area (km2): 1,124

Basin Mean Rainfall in HPPS2								Unit:mm
Year	Rainfall Station							Basin Mean Rainfall
	Cimenteng (54C)	Sukanegara (98)	Pagelaran (109A)	Citambur (129)	Cibuni (133)	Dinewati (65)	Agrabintana (114A)	
1953	2,766	2,475	2,817	-	2,665	-	3,586	2,862
1954	3,757	4,233	3,957	-	3,542	-	4,301	3,958
1955	4,479	5,013	3,662	3,882	4,108	-	4,432	4,263
1956	3,287	-	-	-	3,509	-	3,177	3,324
1957	2,540	3,450	2,941	3,473	-	-	4,615	3,404
1958	3,702	4,464	-	-	-	-	3,792	3,986
1959	2,397	3,877	-	-	3,102	-	3,952	3,332
1960	2,782	-	-	-	-	-	2,707	2,745
1961	1,556	-	2,603	-	-	-	2,207	2,122
1962	2,926	-	3,397	-	-	-	3,323	3,215
1963	2,466	1,660	1,584	-	-	-	-	1,903
1964	2,982	4,088	3,416	3,862	3,140	-	5,278	3,794
1965	2,070	-	2,904	-	-	-	2,905	2,626
1966	4,139	-	-	3,401	-	-	4,373	3,971
1967	2,372	2,958	2,305	3,082	2,187	-	1,471	2,396
1968	4,455	3,864	6,136	4,928	3,513	-	6,305	4,867
1969	3,080	2,952	4,046	3,319	3,392	-	2,669	3,243
1970	2,830	4,659	3,876	3,486	3,615	-	-	3,693
1971	-	5,537	-	3,703	3,551	-	2,748	3,885
1972	-	2,715	2,373	2,610	-	1,987	-	2,421
1973	3,799	-	4,783	4,972	4,290	-	4,640	4,497
1974	2,394	-	3,420	3,953	3,967	-	3,813	3,509
1975	-	4,364	4,057	4,798	3,810	3,829	3,734	4,099
1976	3,329	2,607	2,279	3,698	3,264	3,121	3,591	3,127
1977	-	2,678	2,660	3,361	2,427	3,205	4,581	3,152
1978	-	-	3,946	5,535	4,708	-	4,331	4,630
1979	-	-	-	5,150	4,110	3,350	-	4,203
1980	-	-	-	3,574	4,204	-	3,290	3,689
1981	-	-	-	4,239	3,635	-	3,943	3,939
1982	-	-	-	-	2,856	-	-	2,856
Ave	3,053	3,623	3,358	3,949	3,505	3,098	3,751	3,457
Num	21	17	20	19	21	5	25	30
Collected Rainfall in the Study								
1984	-	-	-	-	4,147	-	-	4,147
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-
1990	-	-	3,594	-	-	-	-	3,594
1991	-	-	-	-	-	-	2,479	2,479
1992	-	-	4,684	-	-	-	-	4,684
1993	-	-	3,578	-	-	-	-	3,578
Ave	-	-	3,952	-	4,147	-	2,479	3,696
Num	0	0	3	0	1	0	1	5
Change	-	-	2.3%	-	0.8%	-	-1.3%	0.6%

Table 54 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (6/8)

No: 34 River Basin: K. Brantas
 Station Name: Kaulon River: K. Brantas
 Station ID by HPPS2: 02-057-01-08 Catchment Area (km2): 2,620

Basin Mean Rainfall in HPPS2 Unit:mm

Year	Rainfall Station							Basin Mean Rainfall
	Semen (153)	Wlingi (164)	Batu (7)	Singosari (51)	Doko (165)	Dampit (28)	Kepanjen (39)	
1951	-	2,018	1,282	1,939	1,525	3,086	1,292	1,857
1952	-	3,012	2,073	1,879	3,511	3,474	1,679	2,605
1953	1,407	1,957	1,431	1,721	2,518	1,922	1,484	1,777
1954	2,774	2,941	2,201	2,330	3,271	4,008	3,382	2,987
1955	5,164	3,382	1,870	2,296	3,722	2,886	2,891	3,173
1956	3,740	2,689	1,508	1,982	3,000	1,579	2,108	2,372
1957	2,759	2,076	1,790	2,293	2,243	1,586	2,132	2,126
1958	3,477	2,215	1,921	2,263	2,478	1,939	2,335	2,375
1959	2,737	2,881	1,922	2,237	2,727	1,663	2,686	2,408
1960	3,287	2,103	1,955	2,681	2,561	1,769	2,166	2,360
1961	1,819	2,234	1,215	1,938	2,277	1,478	1,652	1,802
1962	1,670	2,540	2,455	2,653	2,856	1,907	2,364	2,349
1963	1,791	1,566	1,397	-	1,899	1,341	1,521	1,586
1964	-	2,558	1,845	1,295	2,632	2,122	2,096	2,091
1965	1,159	2,322	1,243	-	1,958	1,415	1,333	1,572
1966	1,526	3,107	1,983	-	3,042	2,085	-	2,349
1967	1,978	2,001	1,717	1,639	1,959	1,651	-	1,824
1968	2,992	3,074	2,145	2,146	3,815	3,065	1,909	2,735
1969	2,269	1,976	1,768	1,674	2,461	1,456	1,554	1,880
1970	2,266	2,315	1,702	1,607	2,816	2,118	-	2,137
1971	2,858	-	2,336	2,128	2,717	2,425	-	2,493
Ave	2,537	2,448	1,798	2,039	2,666	2,142	2,034	2,231
Num	18	20	21	18	21	21	17	21

Collected Rainfall in the Study

1972	1,463	1,503	1,260	1,127	-	-	-	1,338
1973	3,149	3,015	2,379	2,112	3,668	-	2,860	2,864
1974	1,848	2,622	2,246	2,369	2,893	-	2,289	2,378
1975	4,154	3,229	2,444	2,970	3,378	-	3,017	3,199
1976	2,532	1,803	1,515	-	-	-	1,572	1,856
1977	1,728	1,909	1,358	-	-	-	-	1,665
1978	3,609	3,460	1,814	2,474	3,446	-	2,771	2,929
1979	3,271	2,384	-	1,839	2,621	-	2,032	2,429
1980	-	-	-	-	-	-	-	-
1981	-	-	-	1,768	-	-	-	1,768
1982	-	-	-	-	-	-	1,293	1,293
1983	-	2,446	-	-	-	-	-	2,446
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	3,254	-	-	3,254
1987	-	-	-	-	-	-	-	-
1988	3,519	-	1,269	-	2,682	-	-	2,490
Ave	2,808	2,486	1,786	2,094	3,135	-	2,262	2,301
Num	9	9	8	7	7	0	7	13
Change	3.6%	0.5%	-0.2%	0.8%	4.4%	-	3.3%	2.0%

Table 55 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (7/8)

No: 42
 Station Name: PLTA Isal-2 damsite
 Station ID by HPPS2: -

River Basin: Wai Isal
 River: Wai Isal
 Catchment Area (km²): 242

Basin Mean Rainfall in HPPS2				Unit:mm
Year	Rainfall Station			Basin Mean Rainfall
	Manusela (485A)	Wahai (486)	Riring (487C)	
1930	-	-	2,983	2,983
1931	3,717	3,762	3,678	3,719
1932	2,172	1,770	3,106	2,349
1933	2,851	2,208	3,688	2,916
1934	3,321	1,926	3,753	3,000
1935	2,512	2,722	3,617	2,950
1936	3,376	2,203	3,359	2,979
1937	3,606	2,779	4,021	3,469
1938	2,588	2,967	3,422	2,992
1939	2,262	1,916	3,221	2,466
Ave	2,934	2,473	3,485	2,982
Num	9	9	10	10
Collected Rainfall in the Study				
1940	-	1,760	-	1,760
1941	-	903	-	903
1942	-	-	-	-
1943	-	-	-	-
1944	-	-	-	-
1945	-	-	-	-
1946	-	-	-	-
1947	-	-	-	-
1948	-	-	-	-
1949	-	-	-	-
1950	-	-	-	-
1951	-	-	-	-
1952	-	-	-	-
1953	-	-	-	-
1954	-	2,132	-	2,132
1955	2,319	1,962	-	2,141
1956	-	2,239	-	2,239
1957	-	1,839	-	1,839
1958	-	2,412	-	2,412
1959	-	2,021	-	2,021
1960	-	1,922	-	1,922
1961	-	1,671	-	1,671
1962	-	-	-	-
1963	-	-	-	-
1964	-	-	-	-
1965	-	-	-	-
1966	-	2,278	-	2,278
1967	-	1,595	-	1,595
1968	-	1,298	-	1,298
1969	-	2,519	-	2,519
1970	-	2,234	-	2,234
1971	-	2,151	-	2,151
1972	-	1,569	-	1,569
1973	-	3,151	-	3,151
1974	-	1,903	-	1,903
1975	-	2,419	-	2,419
1976	-	1,449	-	1,449
1977	-	2,132	-	2,132
1978	-	3,009	-	3,009
1979	-	1,693	-	1,693
1980	-	1,902	-	1,902
1981	-	1,975	-	1,975
1982	-	878	-	878
1983	-	3,671	-	3,671
1984	-	2,798	-	2,798
1985	-	4,298	-	4,298
1986	-	5,900	-	5,900
1987	-	4,533	-	4,533
1988	-	-	-	-
1989	-	-	-	-
1990	-	-	1,493	1,493
1991	-	-	-	-
1992	-	-	-	-
1993	-	-	-	-
1994	-	-	1,939	1,939
Ave	2,319	2,319	1,716	2,289
Num	1	32	2	34
Change	-2.1%	-4.8%	-8.5%	-5.1%

Table 56 Basin Mean Rainfall of Key Stream Gauge and Collected Rainfall Records (8/8)

No: 43 River Basin: Ira Siquiro
 Station Name: PLTA Ira Lalaro damsite River: Ira Siquiro
 Station ID by HPPS2: - Catchment Area (km2): 406

Basin Mean Rainfall in HPPS2				Unit:mm
Year	Rainfall Station		Basin Mean Rainfall	
	Tutuala (680C)	Los Palos (680B)		
1953	-	1,647	1,647	
1954	-	2,249	2,249	
1955	-	3,622	3,622	
1956	-	2,403	2,403	
1957	1,442	1,444	1,443	
1958	1,483	1,896	1,690	
1959	1,580	1,901	1,741	
1960	1,804	2,062	1,933	
1961	1,382	1,333	1,358	
1962	2,414	2,697	2,556	
1963	1,083	1,312	1,198	
1964	1,860	2,074	1,967	
1965	1,073	1,374	1,224	
1966	1,502	1,564	1,533	
1967	1,401	1,486	1,444	
1968	1,850	2,598	2,224	
1969	1,185	1,478	1,332	
1970	1,828	2,027	1,928	
1971	1,324	1,588	1,456	
1972	1,105	1,711	1,408	
1973	1,991	2,184	2,088	
Ave	1,547	1,936	1,830	
Num	17	21	21	
Collected Rainfall in the Study				
1974	1,295	1,653	1,474	
1975	-	-	-	
1976	-	-	-	
1977	-	-	-	
1978	-	-	-	
1979	-	-	-	
1980	-	-	-	
1981	-	-	-	
1982	-	1,112	1,112	
1983	-	2,425	2,425	
1984	-	2,297	2,297	
1985	-	1,729	1,729	
1986	-	2,071	2,071	
1987	-	1,387	1,387	
1988	-	1,903	1,903	
Ave	1,295	1,822	1,800	
Num	1	8	8	
Change	-0.9%	-1.6%	-1.3%	

Table 57 Calculated Annual Mean Runoff at Key Stream Gauges

Region	No.	Station Name	Supplemented Annual Mean Runoff in HPPS2 Runoff (m3/s)	Result of Analysis		Weighted Annual Mean Runoff Runoff (m3/s)
				Runoff	Rainfall	
				Rate of Change (%)	Rate of Change (%)	
Sumatra	1	Lhok Nibong	175.7	4.7%	-	183.9
	2	Stabat	201.7	-1.6%	-	198.5
	3	Lb. Sipelanduk	28.4	-	-	28.4
	4	Lb. Bendahara	141.5	-3.2%	-	137.0
	5	Tj. Ampalu	77.6	-5.6%	-	73.2
	6	Sungai Dareh	310.2	-5.1%	-	294.5
	7	Muara Inum	107.6	-	-	107.6
	8	Martapura	225.0	-1.4%	-	221.9
	9	Banjarmasin	36.8	1.9%	-	37.5
	10	Kunyir	23.1	-3.3%	-	22.3
	11	Kp. Darang	33.1	-0.9%	-	32.8
	12	Tui Kareng	183.9	3.4%	-	190.1
	13	Hp. Baru	128.9	-6.0%	-	121.3
	14	Air Batu	31.3	7.7%	-	33.7
	15	Air Gadang	121.3	-3.5%	-	117.1
	16	Despetah	45.2	-	-	45.2
Kalimantan	17	Silat damsite	73.7	-	-	73.7
	18	Kelai-2 damsite	293.6	-	-	293.6
	19	Sei Langsung	60.3	-	2.6%	61.8
	20	Panaan	45.6	-6.6%	-	42.6
Sulawesi	21	Tulabolo	60.6	-	-	60.6
	22	Tincep	3.2	-	-3.5%	3.1
	23	Palili	21.2	-	2.2%	21.6
	24	Gillirang	8.2	8.7%	-	8.9
	25	Bila	15.7	4.1%	-	16.4
	26	Likupande	15.5	-10.8%	-	13.9
	27	Bakaru	69.1	-	-	69.1
Jawa	28	Kebon Randu	29.6	-	-	29.6
	29	Cibuni-3 damsite	78.0	-	0.6%	78.5
	30	Rangkasbitung	94.3	-6.5%	-	88.1
	31	Leuwi Goong	30.0	0.2%	-	30.0
	32	Krangan-2	17.0	-8.8%	-	15.5
	33	Banyumas	241.3	-8.4%	-	220.9
	34	Kaulon	102.5	-	2.0%	104.6
	35	Wonorejo	16.9	1.8%	-	17.2
Irian Jaya	36	PLTM Werba	4.4	-	-	4.4
	37	PLTA Warsamson	63.6	-	-	63.6
	38	PLTA Genyem	16.4	-	-	16.4
Bali	39	Buangga	9.8	-	-	9.8
Lombok	40	Santong	1.5	3.8%	-	1.6
Halmahera	41	PLTM Ira	4.1	-	-	4.1
Seram	42	PLTA Isal-2	16.6	-	-5.1%	15.8
Timor	43	PLTA Ira Lalaro	9.5	-	-1.3%	9.3

Daily Runoff Records

No.	Station Name	PLN ID	HPPS2 ID	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Remarks
1	Despetah	01-074-17	01-074-01-02																						The observed water level of Despeta station may be influenced by the water level of PLTA Musi.
2	Lesan Dayak	03-010-01																							
3	Long Lanuk	03-010-02																							
4	Tincep	04-127-01	04-127-01-01																						
5	Palili	04-112-01	04-112-02-02																						
6	Tombo-Bakaru	04-093-03																							
7	Tanggeung	02-103-04																							
8	Pamadangan	02-103-01																							
9	Malanu	05-034-05																							
10	Buangga	07-016-01	07-022-01-01																						
11	Igabola	08-003-02																							
12	Lele Sirata	14-005-01																							

Source: PLN-LITBANG

Daily Water Level Records

No.	Station Name	PLN ID	HPPS2 ID	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Remarks
1	Despetah	01-074-17	01-074-01-02																						
2	Lesan Dayak	03-010-01																							
3	Long Lanuk	03-010-02																							
4	Tincep	04-127-01	04-127-01-01																						
5	Palili	04-112-01	04-112-02-02																						
6	Tombo-Bakaru	04-093-03																							
7	Tanggeung	02-103-04																							
8	Pamadangan	02-103-01																							
9	Malanu	05-034-05																							
10	Buangga	07-016-01	07-022-01-01																						
11	Igabola	08-003-02																							
12	Lele Sirata	14-005-01																							

Source: PLN-LITBANG

Figure 1 Barchart of Collected Daily Runoff and Water Level Records from PLN-LITBANG

Part 8

*Detailed Record of the Field
Observation on Social and Natural
Environment*

PART 8 DETAILED RECORD OF THE FIELD OBSERVATION ON SOCIAL AND NATURAL ENVIRONMENT

1 PROJECT SITE: GUMANTI-1 (W. SUMATRA)

<Intake>

- No residential houses were found at the intake site.
- Substantial water use at Gumanti river was not observed.
- Topography at the site is considered as stable.

<Power House>

- There will be no involuntary resettlement.
- Substantial water use was not observed.
- Topography at the site is considered as stable.



Downstream of PH Site

<General Comment>

- Paddy field was confirmed entirely at the project site.
- Irrigation water for paddy field was taken from a mountain stream.
- The length of water recession section is approximately 3.2km.
- Although it was confirmed through interview to local residents that river was not used for irrigation, some local residents used it for their toilet.
- Land and water use at the water recession section is necessary to be confirmed.
- Existing road will be used for access road though its expansion will be necessary.
- Although residential houses were not confirmed at the proposed site of intake and power house, there were some houses in the project area. There is a risk for such houses to be relocated involuntary due to access road construction or expansion.
- Due consideration of access road planning is necessary for minimizing negative impact.

2 PROJECT SITE: ANAI-1 (W. SUMATRA)

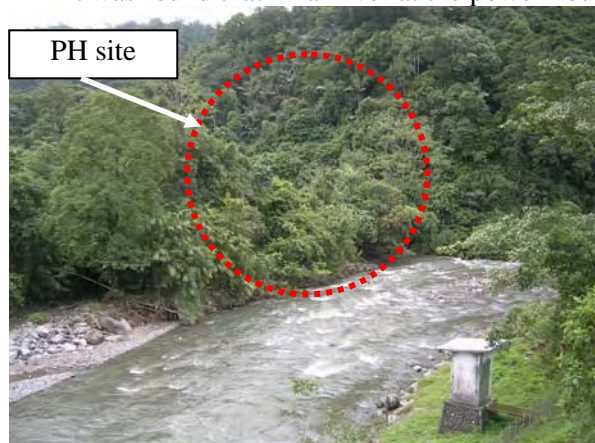
<Intake>

- No residential houses were observed.
- No cultivation area was observed.
- It was found that Anai river at the intake site was not used for irrigation or drinking.
- The site has stable topographical condition.



<Power House>

- No residential houses were observed.
- No cultivated area was confirmed.
- It was found that Anai river at the power house site was not used for irrigation or drinking.



<General Comment>

- The project site is located in the protected forest (Hutan Lindung) according to the relevant parties.
- Confirmation of official procedure for alternation of the forest category for implementing the proposed project is necessary.
- There is a water fall which is tourism spot called “Air Mantur” in the water recession section.
- There is a possibility of land acquisition for access road construction.
- There were about 40 small shops in the project area especially around “Air Mantur”.
- There is a few local people who use Anai river for washing.
- Anai river is used for irrigation at 3km downstream of power house site.
- The length of water recession section is approximately 5 km

3 PROJECT SITE: ENDIKAT-2 (S. SUMATRA)

<Intake>

- No residential houses were observed.
- No water use in Endikat river was observed through interview to local residents.
- The protected forest was said to be located close to the intake site.
- Topographical condition is stable.



<Power House>

- No residential houses were observed.
- Topographical condition is stable.
- No water use in Endikat river was observed through interview to local residents.



<General Comment>

- The project site was covered with secondary forest, and some of parts were used for coffee plantation.
- The length of water recession section is approximately 5km, and land and water use at this section is necessary to be confirmed.
- Location of the protected forest is necessary to be confirmed.

4 PROJECT SITE: CIBARENO (W. JAVA)

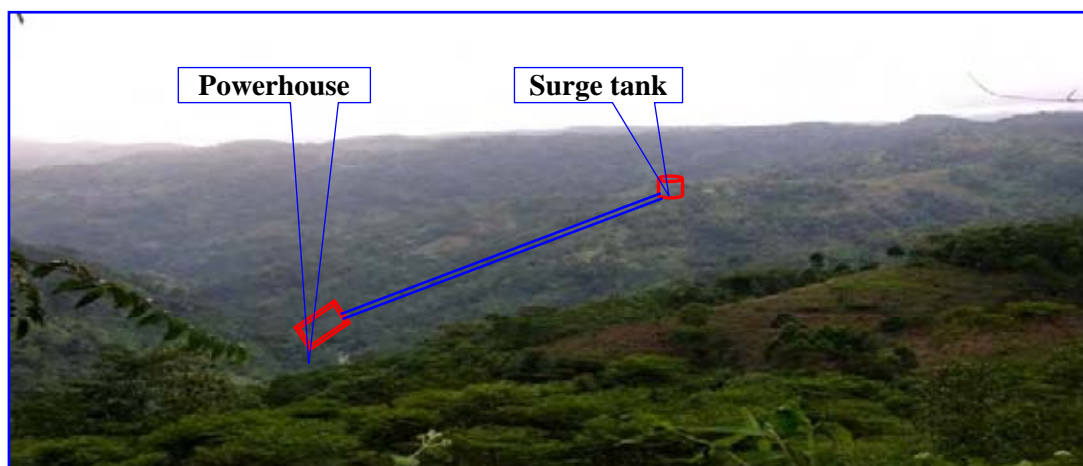
<Intake>

- No residential houses were observed.
- Secondary forest was observed.
- Paddy field was not observed.
- Topography and soil condition was stable with rocky, deep, v-shaped valley.



<Power House>

- No residential houses were observed.
- Secondary forest was observed.
- Paddy field was confirmed.
- Topography and soil condition is stable with rocky, deep, v-shaped valley.



<General>

- Cibareno river is used for irrigation and washing according to local residents.
- The length of water recession section is approximately 3.7km, and land and water use is necessary to be confirmed.
- Existing road will be used as the access road for the construction site though some arrangement such as expansion will be required.

5 PROJECT SITE: SIRAHAR (N. SUMATRA)

<Intake>

- No residential houses were confirmed.
- Sirahar river was used for irrigation, drinking, and washing according to local residence.
- The land at the proposed project site was covered with secondary forest, and part of it was used as rubber plantation for export.
- Topography and soil condition is stable with rocky, deep, and v-shaped valley.

<Power House>

- No residential houses were confirmed.
- Sirahar river was observed to be used for irrigation, drinking, and washing according to local residence.
- There is no inland fisherman.
- Topography and soil condition is stable with rocky, deep, v-shaped valley.
- A protected forest is said to be located at the downstream of power house area.

<General Comment>

- The length of water recession section is approximately 3.5km.
- Land and water use of the water recession section is necessary to be confirmed.



Site condition at 100m upstream from the intake area

6 PROJECT SITE: GUNUNG-2 (N. SUMATRA)

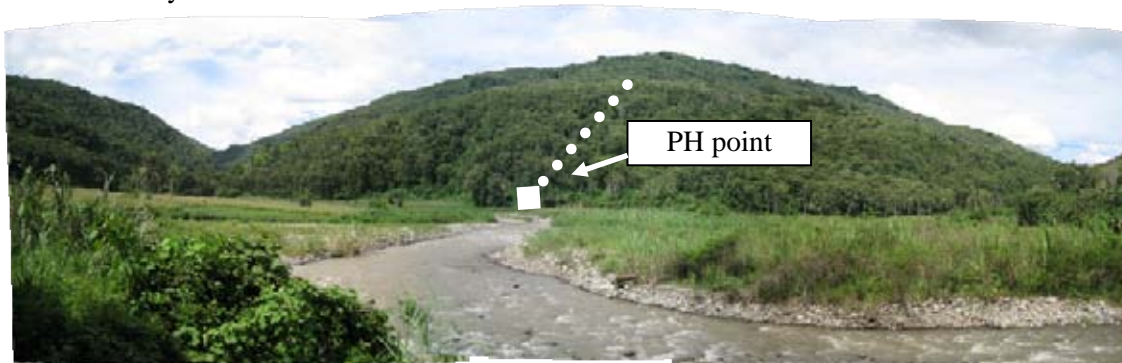
<Intake>

- No residential houses were identified.
- No cultivation areas around the site were found.
- Any other facilities at upstream and downstream of the river were found.
- The intake was located in the very steep valley.
- Rock was exposed along the river, therefore geologically very stable
- Secondary forests were observed around the site.
- The existing local road could be used for construction road, so the impact on the forest due to felling will be minimum.



<Power House>

- No residential houses were identified.
- According to interview to the local people, there are irrigation scheme for the cultivation. The water intake from the river for the irrigation was not identified.
- There are cultivation areas for banana, Cacao, corn and sugarcane etc. at the opposite of the PS site.
- The topographical characteristic is considered as suitable for the construction of the Power house.
- Nothing serious problems about soil were found.
- Secondary forests were observed around the site.



<General Comments>

- The length of the section of water recession is approximately 2.8km.
- There is no cultivation area around the intake point due to the topographical reason. However, cultivation areas including paddy field might be found along the middle or downstream of the river.
- The present status of the land use at the section of the water recession should be confirmed.

7 PROJECT SITE: SIMMANGO-1(N. SUMATRA)

- ROR power plant is already under construction by IPP scheme.
- The location of the power house is approximate 500m downstream from the intake



(The intake for the IPP)



(PH under construction)

8 PROJECT SITE: SIMMANGO-2 (N. SUMATRA)

<Intake>

- No residential houses were identified.
- No cultivation area around the intake point.
- Secondary forests were observed around the site.
- Rock was exposed along the river, therefore geologically very stable.

<Power House>

- There are five houses and small scale paddy land at the opposite site of the PH site. But relocation will not be necessary.
- The access road to the PS site from the existing road will be necessary. However the road has no impact to those houses.

<General Comments>

- The length of the section of water recession is approximately 7.8km.
- There are narrow path to the intake point along the river.
- Small scale cultivation areas and grazing land were found at left side of the path.



(View of the intake point from 1km downstream)

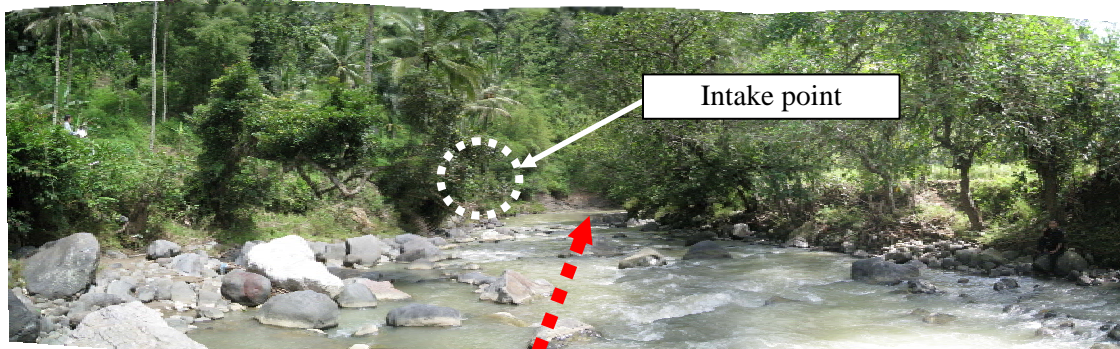


(View of the PH site from the existing road)

9 PROJECT SITE: CIMANDIRI-1 (W.JAVA)

<Intake>

- Secondary forest and paddies were observed around the intake point.
- Cassava, banana etc. were cultivated at agricultural land.
- No residential houses were identified.
- Well maintained irrigation systems were observed.
- Some paddies will be under water after completion of the intake.
- Sedimentation was concerned because the river water was muddy.



<Weir point>

- The weir is planned at the junction of the main stream and tributary.
- The weir is located at the border of the village of “Ci Cadas” and “Ci TalHab”.
- Irrigation bridge was observed at the upstream of the weir point.
- Secondary forest and paddies were found around the point
- Some paddies along the river will be under water after completion of the weir construction.
- No residential houses were identified.