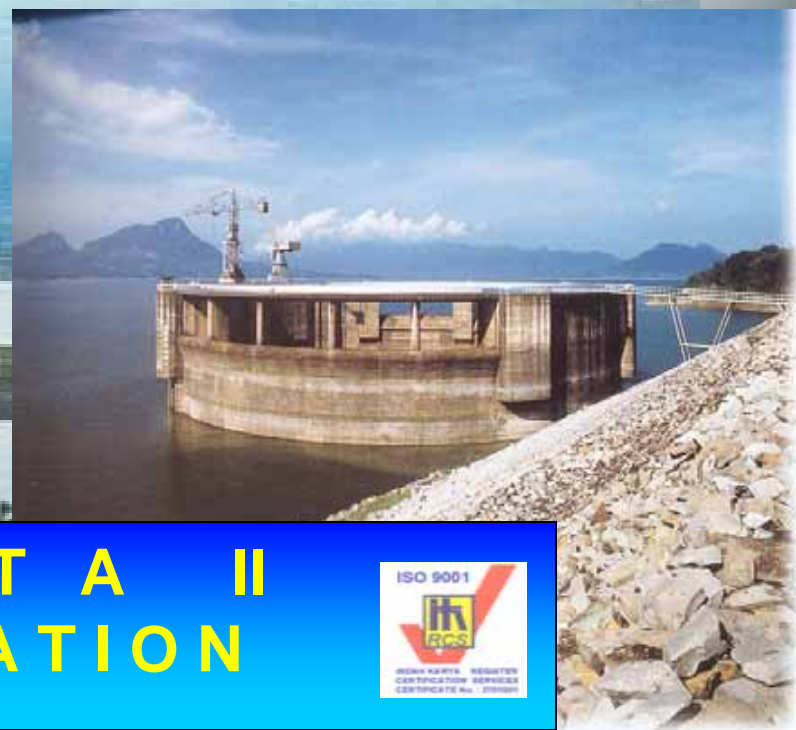




# CITARUM WATER RESOURCES OPERATION

Implemented by Jasa Tirta II Public Corporation

*Presentation For :*  
NARBO 3<sup>rd</sup> Training Workshop  
Daejeon – Korea  
November, 13 - 18, 2005



**J A S A T I R T A I I  
P U B L I C C O R P O R A T I O N**



# ORIENTATION MAP WEST JAVA PROVINCE



Western part of the world

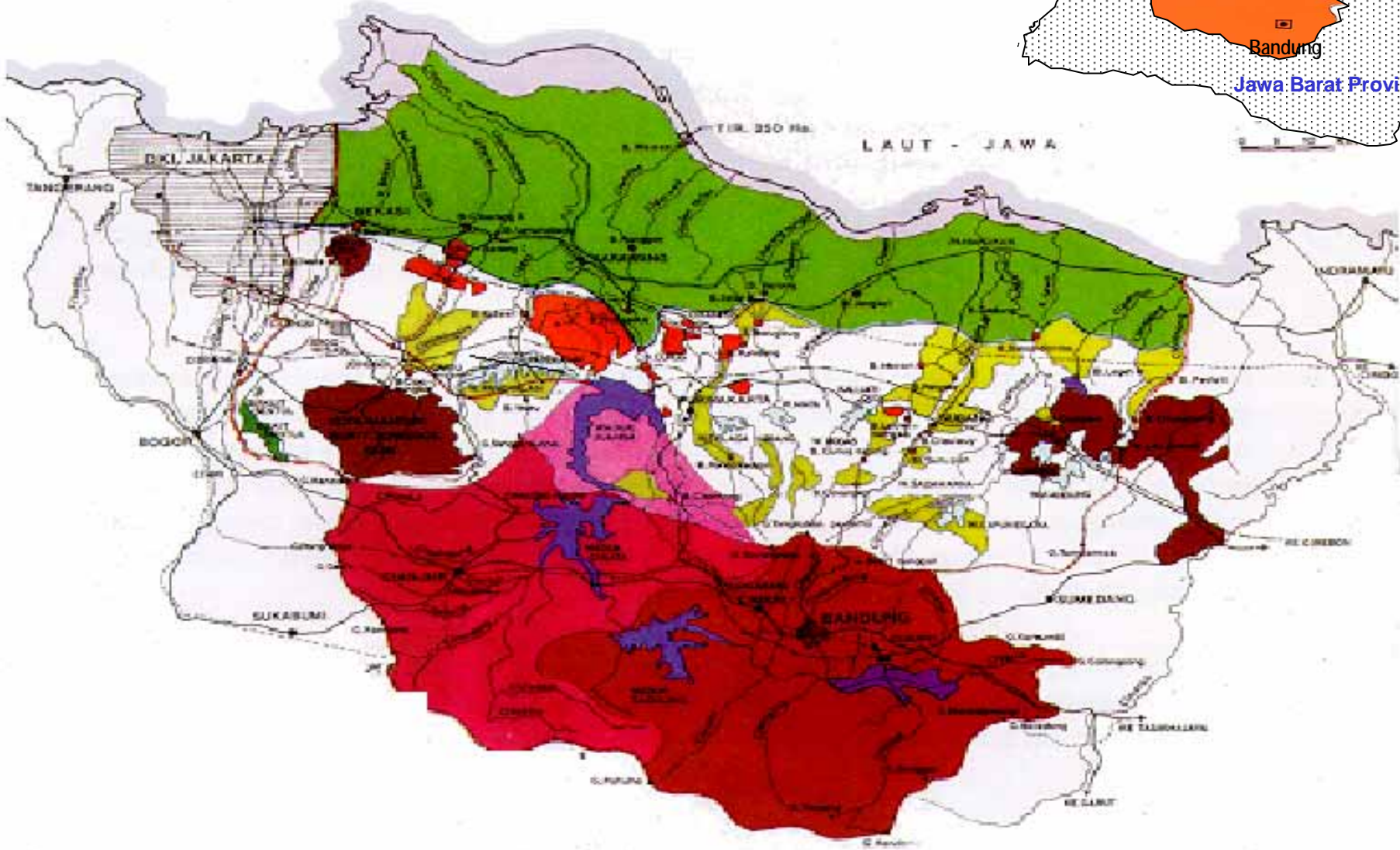
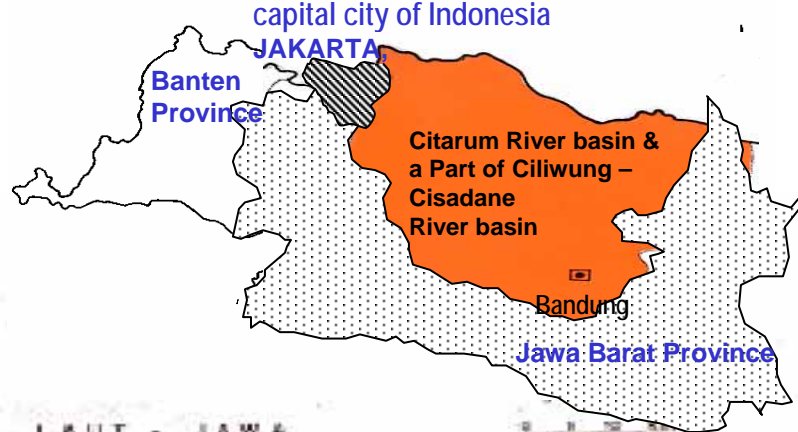


West Java Province

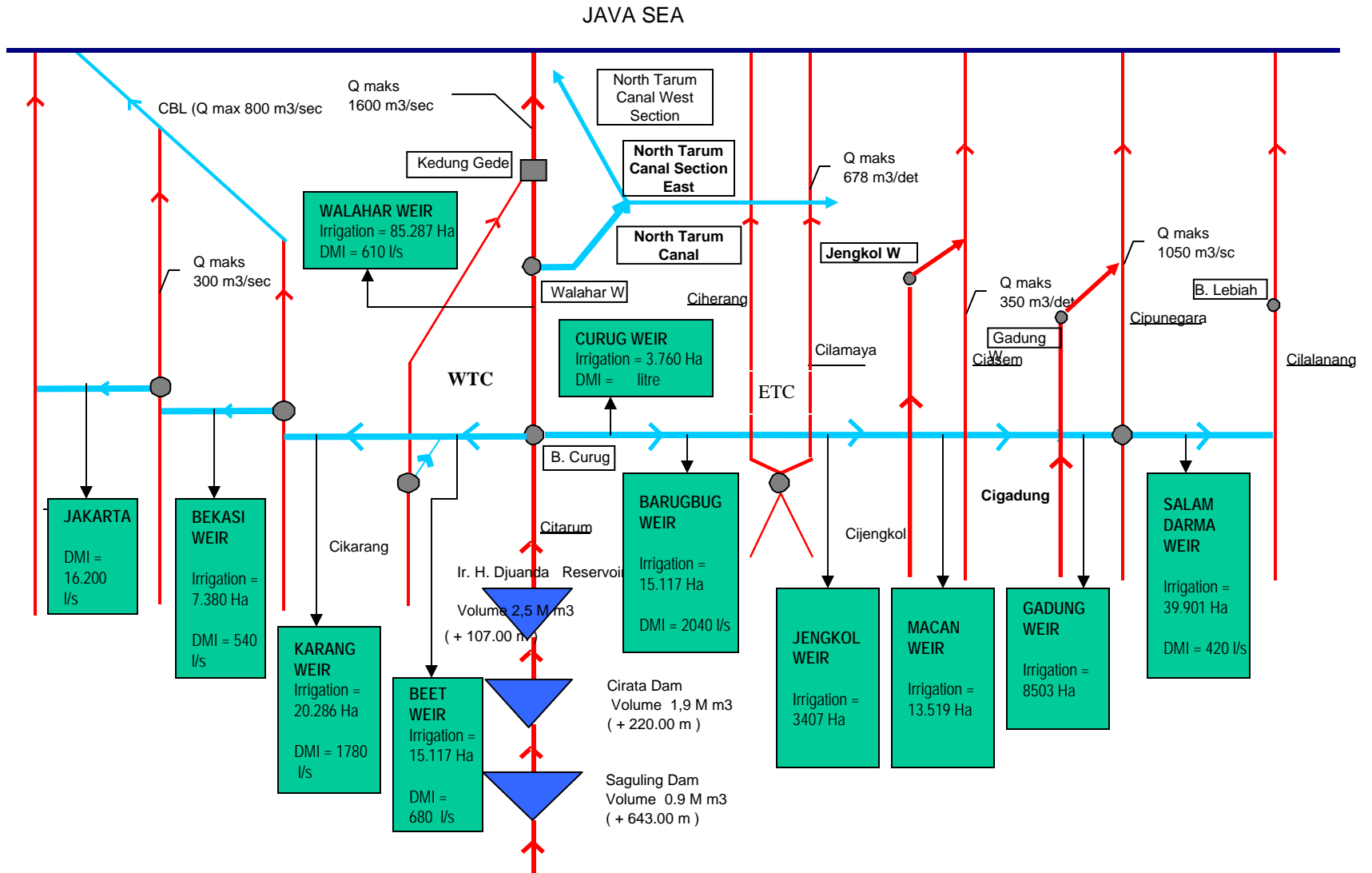
CITARUM RIVER BASIN  
AREA



# CITARUM RIVER BASIN AREA



# SCHEME OF CITARUM WATER SYSTEM



# AVERAGE ANNUAL FLOW OF WATER IN THE BASIN

NO	RIVERS	AVERAGE ANNUAL FLOW IN 10 <sup>6</sup> m <sup>3</sup>	MONITORING STATION
1.	CIPAMINGKIS	280	PAMINGKIS WEIR
2.	CIBEET	1.180	BEET WEIR
3.	CITARUM	5.770	JUANDA Dam/Reservoir
4.	CIKAO	480	CURUG WEIR
5.	CILAMAYA / CIHERANG	660	BARUGBUG WEIR
6.	CIJENGKOL	250	JENGKOL WEIR
7.	CIASEM	570	MACAN WEIR
8.	CIGADUNG	180	GADUNG WEIR
9.	CIPUNEGARA	1.900	SALAMDARMA WEIR
10.	CIPANCUH	150	PANCUH Dam/Reservoir
11.	BEKASI	1.030	BEKASI WEIR
12.	CIKARANG	500	KARANG WEIR
	<b>JUMLAH</b>	<b>12.950</b>	

## Water Balance in Citarum River Basin (from 1990 to 2002)

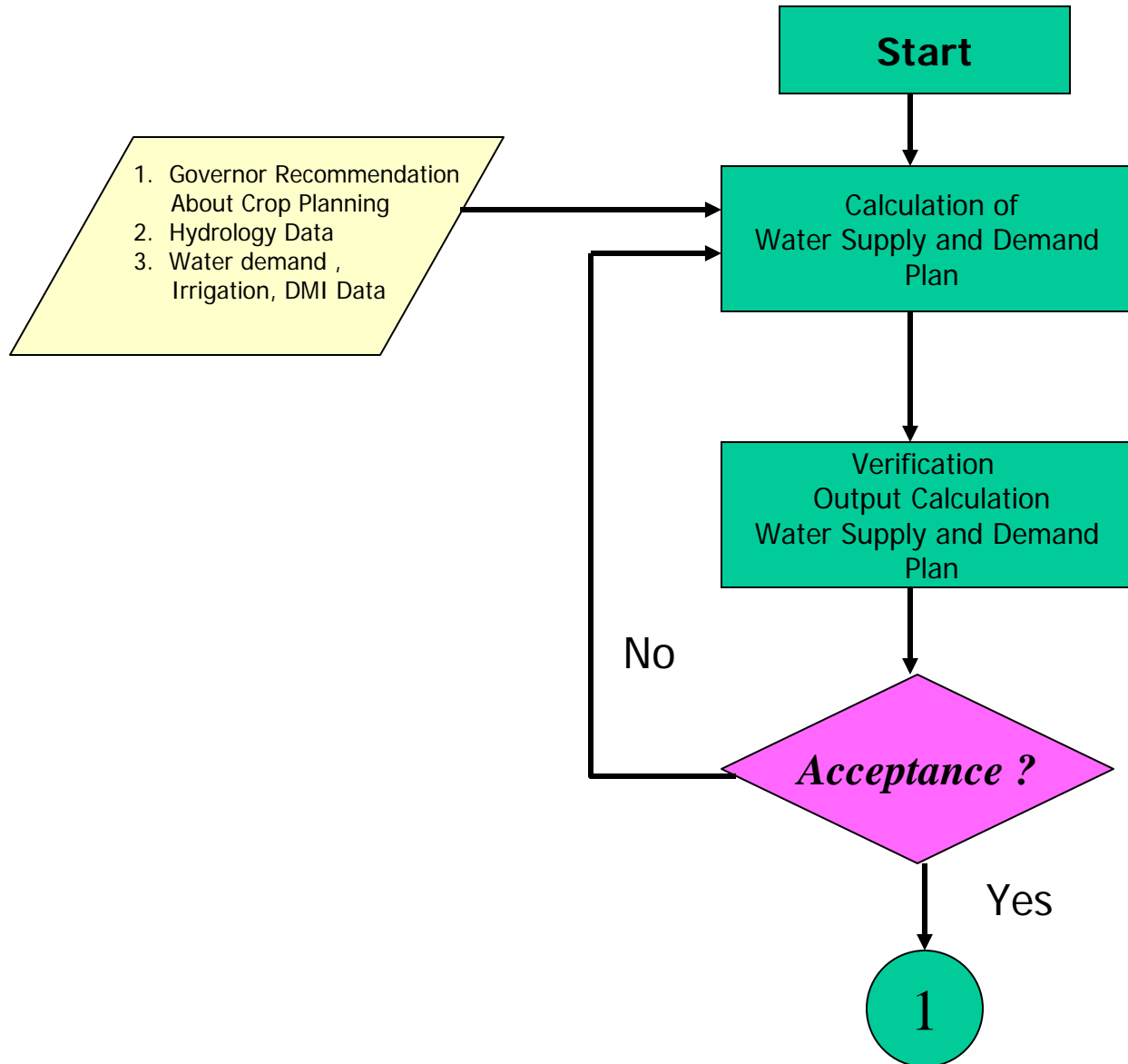
Year	ANNUAL FLOW ( Million m <sup>3</sup> /year)			Utilization (Million m <sup>3</sup> /year)				Water Balance
	Citarum River	Other Rivers	Total	Irrigation	Domestic	Industrial	Total	
1990	5.452,8	3.857,5	9.310,3	5.702,7	204,6	81,3	5.988,6	3.321,7
1991	5.561,3	3.901,5	9.462,8	5.563,6	235,3	108,2	5.907,1	3.555,7
1992	7.463,0	6.407,0	13.870,0	5.619,9	198,5	117,5	5.935,9	7.934,1
1993	8.478,7	6.660,4	<b>15.139,1</b>	5.053,2	249,7	110,6	5.413,5	9.725,6
1994	7.235,3	5.167,4	12.402,7	5.418,7	331,3	126,8	5.876,8	6.525,9
1995	6.544,2	5.841,2	12.385,4	6.113,4	294,3	147,4	6.555,1	5.830,3
1996	6.864,3	6.062,8	12.927,1	6.789,6	331,3	137,9	7.258,8	5.668,3
1997	4.644,2	3.236,2	<b>7.880,4</b>	5.472,1	395,3	155,9	6.023,3	1.857,1
1998	6.661,4	6.442,6	13.104,0	7.151,1	448,1	149,4	7.748,6	5.355,4
1999	5.587,0	4.692,4	10.279,4	5.687,6	422,9	153,8	6.264,3	4.015,1
2000	4.966,6	5.505,9	10.472,5	5.978,3	428,2	164,7	6.571,0	3.901,5
2001	7.122,3	6.461,9	13.584,2	6.317,1	471,2	196,4	6.984,8	6.599,4
2002	5.540,1	5.882,0	11.422,1	5.781,6	522,2	203,6	6.507,4	4.914,7

## Trend of Water Balance in Citarum River Basin (From 1990 to 2025 )

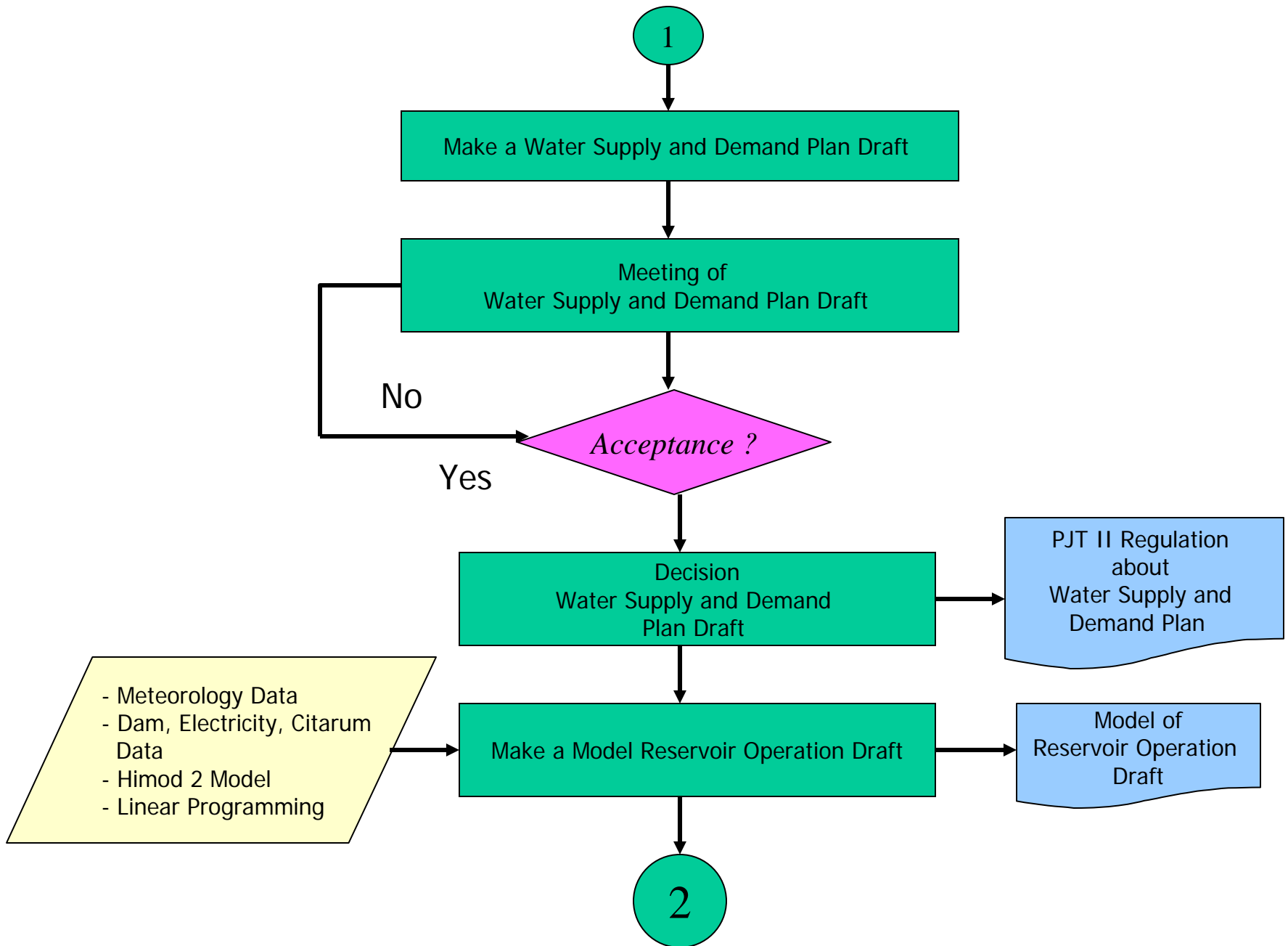
No.	DESCRIPTION	1990		2005		2025	
		m <sup>3</sup> /s	10 <sup>6</sup> m <sup>3</sup>	m <sup>3</sup> /s	10 <sup>6</sup> m <sup>3</sup>	m <sup>3</sup> /s	10 <sup>6</sup> m <sup>3</sup>
1.	SOURCES:						
	Citarum and its Reservoirs	182.33	5,750.00	182.33	5,750.00	182.33	5,750.00
	Other rivers	60.25	1,900.00	61.83	1,950.00	63.42	2,000.00
2.	DEMANDS:						
	Irrigation	177.30	5,591.71	175.00	5,518.80	168.00	5,298.05
	Industry	7.91	249.45	15.00	473.04	25.00	788.40
	Drinking water	9.77	308.11	21.30	671.72	45.00	1,419.12
	Fisheries	1.00	31.54	10.00	315.36	20.00	630.72
	Flushing	2.00	63.07	10.00	315.36	15.00	473.04
	Peak Load	9.51	300.00	3.17	100.00	0.00	0.00
3.	WATER BALANCE:						
	Sources	242.58	7,650.00	244.16	7,700.00	245.75	7,750.00
	Demands	207.49	6,543.88	234.47	7,394.28	273.00	8,609.33
	Water Balance	35.09	1,106.12	9.69	305.72	(27.25)	(859.33)

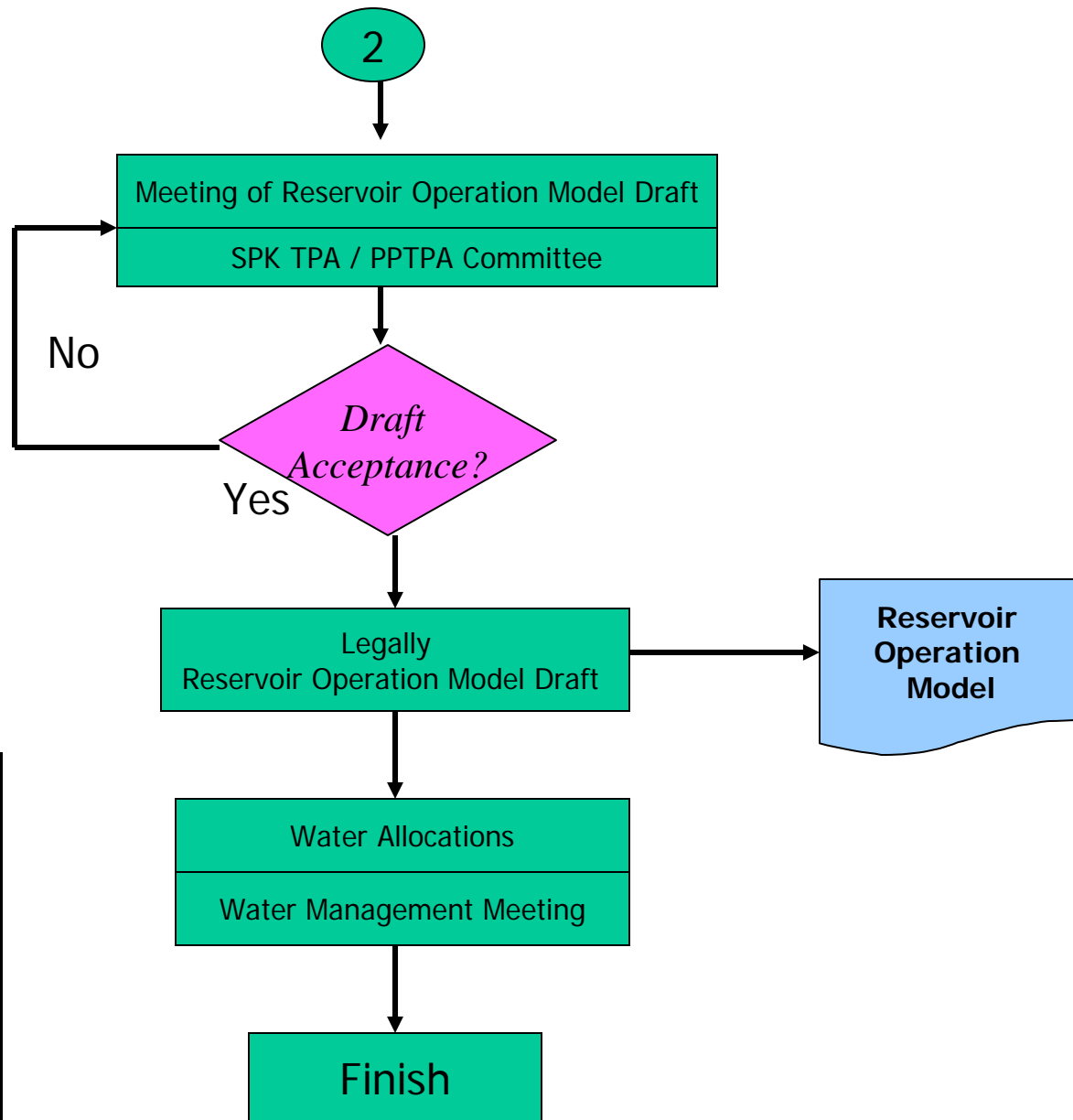
source: BCEOM, 1990

# CITARUM WATER RESOURCES SYSTEM OPERATION PROCEDURE



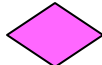








Remarks :

 Input

 Verification

 Process

 Output

# CITARUM WATER RESOURCES SYSTEM MODEL OUTPUT

## WATER DEMAND FOR PADDY CROP OTHER CROP, DMI AND OTHER DEMAND CROP SEASON OF RENDENG YEAR 2004/2005 AND CROP SEASON OF YEAR 2005 IN WEST TARUM

No	Area	Golongan	Extensive (hectare)		Water Demand (m3/sec)																							
			Rendeng	Gadu	October		November		December		January		February		March		April		May		June		July		August		September	
					I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	PAM Pejompongan				5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90
2	PAM Pulogadung				4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
3	PAM Buaran				5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70
4	PAM DKI (1 s.d 3)				16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20
5	Bekasi Weir	I	186	186	0.20	0.18	0.13	0.10	0.09	0.09	0.09	0.08	0.06	0.00	0.14	0.14	0.12	0.12	0.14	0.16	0.17	0.15	0.00					
6	Bekasi Weir	II	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
7	Bekasi Weir	III	1,468	936			1.34	1.23	0.85	0.69	0.65	0.62	0.70	0.63	0.53	0.00	0.76	0.83	0.74	0.73	0.80	0.90	0.89	0.81	0.00			
8	Bekasi Weir	IV	3,595	2,962				3.02	2.88	1.98	1.58	1.51	1.51	1.69	1.65	1.58	0.00	2.64	2.81	2.52	2.43	2.64	2.90	2.67	2.37	0.00		
9	Bekasi Weir	V	2,131	681					1.70	1.64	1.09	0.87	0.90	0.90	1.07	1.17	1.09	0.00	0.65	0.69	0.61	0.59	0.61	0.65	0.61	0.57	0.00	
10	DMI				0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
11	Palawija	I		300																					0.09	0.13	0.16	0.07
12	Total 4 to 11				16.94	16.92	18.21	21.10	22.27	4.94	20.15	19.82	19.91	19.96	20.12	19.64	18.70	20.33	21.08	20.83	20.74	21.01	21.14	20.87	19.81	17.44	16.90	16.81
13	Loss 5 %				0.85	0.85	0.91	1.05	1.11	0.25	1.01	0.99	1.00	1.00	1.01	0.98	0.94	1.02	1.05	1.04	1.04	1.05	1.06	1.04	0.99	0.87	0.84	0.84
14	Bekasi Weir Demand				17.79	17.76	19.12	22.15	23.38	5.18	21.15	20.81	20.91	20.95	21.13	20.62	19.64	21.34	22.13	21.88	21.78	22.07	22.20	21.91	20.80	18.31	17.74	17.65
15	Bekasi Weir Supply				5.95	9.78	11.90	12.51	9.03	12.34	14.78	15.40	16.41	15.45	13.14	12.86	15.23	16.07	17.40	14.08	10.17	8.52	<b>8.03</b>	<b>6.81</b>	3.88	2.65	3.74	3.09
16	Addition from Karang Weir				11.84	7.98	7.22	9.64	14.35	0.00	6.37	5.42	4.50	5.50	7.99	7.76	4.41	5.28	4.73	7.80	11.61	13.55	14.17	15.10	16.92	15.66	14.00	14.56
17	Karang Weir	I	610	610	0.66	0.59	0.44	0.34	0.31	0.29	0.31	0.27	0.21	0.00	0.45	0.47	0.39	0.39	0.45	0.52	0.54	0.51	0.00					
18	Karang Weir	II	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
19	Karang Weir	III	6,611	6,611			6.02	5.55	3.83	3.11	2.91	2.78	3.17	2.84	2.38	0.00	5.35	5.88	5.22	5.16	5.62	6.35	6.28	5.75	0.00			
20	Karang Weir	IV	9,310	6,434				7.82	7.45	5.12	4.10	3.91	3.91	4.38	4.28	4.10	0.00	5.73	6.11	5.47	5.28	5.73	6.31	5.79	5.53	0.00		
21	Karang Weir	V	3,755	2,490					3.00	2.89	1.92	1.54	1.58	1.58	1.88	2.07	1.92	0.00	2.37	2.51	2.24	2.14	2.24	2.37	2.39	2.09	0.00	
22	DMI				1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78
23	Other Crop (Palawija)	I		400																					0.12	0.17	0.21	0.09
24	Total 16 to 22				14.28	10.35	15.46	25.13	30.73	13.19	17.38	15.69	15.15	16.08	18.76	16.17	13.85	19.06	20.66	23.24	27.07	28.05	30.78	30.79	26.74	19.70	15.99	16.43
25	Loss 5 %				0.71	0.52	0.77	1.26	1.54	0.66	0.87	0.78	0.76	0.80	0.94	0.81	0.69	0.95	1.03	1.16	1.35	1.40	1.54	1.54	1.34	0.98	0.80	0.82
26	Karang Weir Demand				15.00	10.87	16.23	26.38	32.26	13.85	18.25	16.48	15.90	16.88	19.70	16.98	14.54	20.01	21.70	24.40	28.42	29.45	32.32	32.33	28.08	20.68	16.79	17.25

No	Area	Extensive (hectar)			Water Demand (m3/sec)																								
					October		November		December		January		February		March		April		May		June		July		August		September		
		Rehendeng	Gadu	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
27	Karang Weir Supply				2.62	1.51	4.01	3.64	4.25	6.32	7.94	7.93	7.61	6.52	6.91	5.54	8.61	8.85	7.70	4.16	3.45	3.01	<b>2.46</b>	<b>1.98</b>	1.45	1.22	1.04	1.94	
28	Addition from Beet Weir				12.37	9.35	12.22	22.75	28.02	7.52	10.31	8.55	8.30	10.36	12.79	11.44	5.93	11.16	14.00	20.24	24.97	26.44	29.86	30.35	26.63	19.47	15.75	15.32	
29	Beet weir	I	2,217	2,217	2.42	2.13	1.60	1.22	1.13	1.04	1.11	0.98	0.75	0.00	1.62	1.71	1.42	1.42	1.64	1.88	1.97	1.84	0.00						
30	Beet weir	II	4,650	4,650		4.46	4.23	2.88	2.37	2.19	2.05	2.23	2.05	1.53	0.00	3.58	3.77	3.35	3.35	3.77	4.28	4.37	3.91	0.00					
31	Beet weir	III	7,637	7,138			6.95	6.42	4.43	3.59	3.36	3.21	3.67	3.28	2.75	0.00	5.78	6.35	5.64	5.57	6.07	6.85	6.78	6.21	0.00				
32	Beet weir	IV	4,762	4,762				4.00	3.81	2.62	2.10	2.00	2.00	2.24	2.19	2.10	0.00	4.24	4.52	4.05	3.90	4.24	4.67	4.29	4.10	0.00			
33	Beet weir	V	2,015	0					1.61	1.55	1.03	0.83	0.85	0.85	1.01	1.11	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
34	Other Crop (Palawija)	I		121																					0.04	0.05	0.06	0.03	
35	DMI				0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
36	Reside of gadu 2004	VIII		10,864	10.43	9.13	6.74																						
37	Reside of gadu 2004	IX		8,407	7.73	6.47	5.30	4.96																					
38	Total 27 to 35				33.63	32.22	37.71	36.90	42.04	19.19	20.62	18.47	18.28	18.94	21.03	20.60	18.60	27.20	29.82	36.19	37.87	38.42	41.89	41.52	31.44	20.19	16.49	16.02	
39	Loss 5 %				1.68	1.61	1.89	1.84	2.10	0.96	1.03	0.92	0.91	0.95	1.05	1.03	0.93	1.36	1.49	1.81	1.89	1.92	2.09	2.08	1.57	1.01	0.82	0.80	
40	Beet Weir Demand				35.31	33.83	39.59	38.74	44.15	20.15	21.65	19.39	19.20	19.88	22.08	21.63	19.53	28.56	31.31	38.00	39.76	40.34	43.98	43.59	33.01	21.20	17.32	16.82	
41	Beet weir supply				4.04	4.01	7.37	13.71	12.77	10.77	14.50	15.80	16.10	14.14	15.55	17.90	18.00	18.00	18.00	9.22	6.89	3.44	<b>3.23</b>	<b>2.21</b>	1.69	1.80	0.99	1.50	
42	Addition from Curug weir				31.27	29.82	32.23	25.03	31.38	9.38	7.15	3.59	3.10	5.74	6.53	3.74	1.53	10.56	13.31	28.78	32.87	36.90	40.75	41.38	31.32	19.40	16.32	15.32	
43	B. Curug (Btb 1 to 22)	I	3,750	3,750	4.09	3.60	2.70	2.06	1.91	1.76	1.88	1.65	1.28	0.00	2.74	2.89	2.40	2.40	2.78	3.19	3.34	3.11	0.00						
44	Other crop (Palawija)	I		3,750																					1.13	1.58	1.99	0.86	
45	DMI				1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	
46	Total 38 to 41				36.65	34.71	36.22	28.38	34.58	12.43	10.32	6.53	5.66	7.03	10.56	7.91	5.22	14.25	17.38	33.25	37.50	41.30	42.04	42.67	33.74	22.27	19.60	17.48	
47	Loss 5 %				1.83	1.74	1.81	1.42	1.73	0.62	0.52	0.33	0.28	0.35	0.53	0.40	0.26	0.71	0.87	1.66	1.88	2.06	2.10	2.13	1.69	1.11	0.98	0.87	
48	Losses cause Physic				11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	
49	Curug Weir Demand				49.48	47.45	49.03	40.80	47.31	24.05	21.83	17.86	16.95	18.38	22.09	19.31	16.48	25.96	29.25	45.92	50.38	54.36	55.14	55.81	46.42	34.38	31.58	29.35	
50	Add in Curug weir				60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	
51	Balance				10.52	12.55	10.97	19.20	12.69	35.95	38.17	42.14	43.05	41.62	37.91	40.69	43.52	34.04	30.75	14.08	9.62	5.64	4.86	4.19	13.58	25.62	28.42	30.65	

**WATER DEMAND FOR PADDY CROP  
OTHER CROP, DMI AND OTHER DEMAND  
CROP SEASON OF RENDENG YEAR 2004/2005 AND CROP SEASON OF YEAR 2005  
IN NORTH TARUM**

No	Area	Golongan	Extensive (hectare)		Water Demand (m3/sec)																							
					October		November		December		January		February		March		April		May		June		July		August		September	
			Rendeng	Gadu	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	Walahar	I	13,156	13,156	13.16	12.24	8.95	7.24	6.31	6.05	6.58	5.92	4.87	0.00	10.13	10.26	8.29	7.89	9.08	10.92	11.18	10.39	0.00					
2	Walahar	II	17,467	17,467		16.24	15.20	11.00	8.38	8.03	7.69	8.56	8.21	6.46	0.00	13.62	14.15	11.88	11.70	13.27	15.37	15.02	14.67	0.00				
3	Walahar	III	18,985	18,985			16.52	16.14	10.44	8.54	8.35	8.35	9.68	8.92	7.59	0.00	15.38	16.14	14.05	13.86	15.38	16.14	17.66	17.09	0.00			
4	Walahar	IV	15,942	15,942				13.55	12.28	8.45	7.01	7.01	7.17	8.13	7.97	7.33	0.00	13.55	14.35	12.91	12.43	14.19	15.78	16.10	14.51	0.00		
	Walahar	V	19,728	19,728					16.77	15.19	10.46	8.68	8.68	8.88	10.06	9.86	9.07	0.00	16.77	17.76	15.98	15.39	17.56	19.53	19.93	17.95	0.00	
5	Residue of Gadu 2004	VIII		16,316	14.85	12.07	9.63																					
		IX		11,306	10.63	9.61	7.35	5.54																				
6	Other crop (Palawija)			24,070																					7.22	10.11	12.76	5.54
7	Fishpond				1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
8	DMI				0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
9	Total 1 to 8				40.74	52.27	59.74	55.58	56.29	48.38	42.20	40.64	40.72	34.50	37.87	43.19	49.00	51.57	68.06	70.83	72.46	73.24	67.78	54.83	43.76	30.17	14.87	7.65
10	Loss 5 %				2.04	2.61	2.99	2.78	2.81	2.42	2.11	2.03	2.04	1.73	1.89	2.16	2.45	2.58	3.40	3.54	3.62	3.66	3.39	2.74	2.19	1.51	0.74	0.38
11	Walahar weir Demand				42.78	54.89	62.73	58.36	59.11	50.80	44.31	42.67	42.76	36.23	39.76	45.35	51.45	54.15	71.46	74.37	76.08	76.90	71.17	57.57	45.95	31.68	15.61	8.03
12	Losses cause Physic				9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
13	Curug Weir Demand				51.78	63.89	71.73	67.36	68.11	59.80	53.31	51.67	51.76	45.23	48.76	54.35	60.45	63.15	80.46	83.37	85.08	85.90	80.17	66.57	54.95	40.68	24.61	17.03
14	Curug weir supply				90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
15	BALANCE				38.22	26.11	18.27	22.64	21.89	30.20	36.69	38.33	38.24	44.77	41.24	35.65	29.55	26.85	9.54	6.63	4.92	4.10	9.83	23.43	35.05	49.32	65.39	72.97

**WATER DEMAND FOR PADDY CROP  
OTHER CROP, DMI AND OTHER DEMAND  
CROP SEASON OF RENDENG YEAR 2004/2005 AND CROP SEASON OF YEAR 2005  
IN EAST TARUM**

No	Area	Cabangan	Extensive (hectare)		Water Demand (m3/sec)																								
					October		November		December		January		February		March		April		May		June		July		August		September		
			Rendeng	Gadu	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1	Salamdarma	I	3,325	3,325	3.52	3.36	2.56	2.03	1.86	1.76	1.83	1.60	1.26	0.00	2.43	2.43	1.83	1.66	1.90	2.36	2.49	2.53	0.00						
2	Salamdarma	II	10,670	10,670		10.78	10.14	7.26	5.87	5.66	5.23	5.55	5.12	3.95	0.00	7.79	7.68	6.19	5.87	6.83	8.32	9.28	9.07	0.00					
3	Salamdarma	III	10,421	10,421			9.90	9.38	6.57	5.42	5.11	4.90	5.42	4.90	3.86	0.00	7.50	7.82	6.46	6.36	7.40	9.38	10.00	9.69	0.00				
4	Salamdarma	IV	6,118	6,118				5.51	5.20	3.67	3.00	2.88	2.81	3.06	2.88	2.45	0.00	4.59	4.77	4.22	4.22	5.02	6.06	6.36	5.81	0.00			
5	Salamdarma	V	9,367	9,367					7.96	7.68	5.34	4.31	4.31	4.22	4.78	5.71	3.93	0.00	7.31	7.87	7.12	7.40	8.62	9.93	9.84	8.71	0.00		
6	Residue of gadu 2004	VIII		2,500	2.35	2.03	1.68																						
7	Residue of gadu 2004	IX		1,500	1.38	1.16	1.04	0.80																					
8	Other crop (Palawija)			5,000																						1.50	2.10	2.65	1.15
9	Fishpond				1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46
10	Suplesi to Lebih				2.10	1.90	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.00	0.00
11	Exor Pertamina				0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
12	DMI				0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13	Total 1 to 12				11.30	21.16	28.76	28.41	30.91	27.64	23.95	22.68	22.38	19.57	17.38	21.83	24.40	23.70	29.75	31.08	33.00	37.05	37.20	29.43	20.60	14.26	4.60	3.10	
14	Loss 5 %				0.57	1.06	1.44	1.42	1.55	1.38	1.20	1.13	1.12	0.98	0.87	1.09	1.22	1.19	1.49	1.55	1.65	1.85	1.86	1.47	1.03	0.71	0.23	0.15	
15	Salamdarma weir demand				11.87	22.22	30.19	29.83	32.45	29.02	25.15	23.81	23.49	20.55	18.25	22.92	25.62	24.89	31.24	32.64	34.65	38.91	39.06	30.90	21.63	14.97	4.83	3.25	
16	Salamdarman weir supply				2.67	9.50	15.46	21.22	25.96	27.44	28.11	33.21	31.51	36.00	36.00	36.00	36.00	36.00	36.00	35.20	22.40	14.21	5.24	4.17	1.50	0.95	2.83	2.60	
17	Needed supply				9.20	12.72	14.73	8.61	6.49	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.44	12.25	23.70	31.82	26.73	20.13	14.02	2.00	0.66	
18	Gadung	I	610	610	0.65	0.62	0.47	0.37	0.34	0.32	0.34	0.29	0.23	0.00	0.45	0.45	0.34	0.31	0.35	0.43	0.46	0.46	0.00						
19	Gadung	II	617	617		0.62	0.59	0.42	0.34	0.33	0.30	0.32	0.30	0.23	0.00	0.45	0.44	0.36	0.34	0.39	0.48	0.54	0.52	0.00					
20	Gadung	III	2,220	2,220			2.11	2.00	1.40	1.15	1.09	1.04	1.15	1.04	0.82	0.00	1.60	1.67	1.38	1.35	1.58	2.00	2.13	2.06	0.00				
21	Gadung	IV	5,056	5,056				4.55	4.30	3.03	2.48	2.38	2.33	2.53	2.38	2.02	0.00	3.79	3.94	3.49	3.49	4.15	5.01	5.26	4.80	0.00			
22	Total 18 s.d. 21				0.65	1.24	3.16	7.34	6.38	4.84	4.20	4.03	4.01	3.80	3.64	2.92	2.38	6.12	6.01	5.67	6.00	7.14	7.66	7.32	4.80	0.00	0.00	0.00	
23	Loss 5 %				0.03	0.06	0.16	0.37	0.32	0.24	0.21	0.20	0.20	0.19	0.18	0.15	0.12	0.31	0.30	0.28	0.30	0.36	0.38	0.37	0.24	0.00	0.00	0.00	
24	Gadung Weir Demand				0.68	1.30	3.32	7.71	6.70	5.08	4.41	4.24	4.21	3.99	3.83	3.06	2.50	6.43	6.31	5.95	6.30	7.50	8.04	7.69	5.04	0.00	0.00	0.00	
25	Gadung Weir Supply				0.47	0.82	3.05	4.96	4.97	5.13	7.16	6.68	6.62	6.93	6.97	7.87	7.13	6.85	6.45	6.20	6.01	5.90	4.72	4.69	2.94	1.70	0.46	0.38	
26	Needed supply				0.21	0.48	0.27	2.75	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	1.60	3.32	3.00	2.10	0.00	0.00	0.00	
27	Macan	I	3,902	3,902	4.14	3.94	3.00	2.38	2.19	2.07	2.15	1.87	1.48	0.00	2.85	2.85	2.15	1.95	2.22	2.77	2.93	2.97	0.00						
28	Macan	II	3,008	3,008		3.04	2.86	2.05	1.65	1.59	1.47	1.56	1.44	1.11	0.00	2.20	2.17	1.74	1.65	1.93	2.35	2.62	2.56	0.00					
29	Macan	III	2,727	2,727			2.59	2.45	1.72	1.42	1.34	1.28	1.42	1.28	1.01	0.00	1.96	2.05	1.69	1.66	1.94	2.45	2.62	2.54	0.00				
30	East Tarum 45 - 53d	I	2,990	2,990	3.17	3.02	2.30	1.82	1.67	1.58	1.64	1.44	1.14	0.00	2.18	2.18	1.64	1.50	1.70	2.12	2.24	2.27	0.00						
31	Pawelutan	I	892	892	0.95	0.90	0.69	0.54	0.50	0.47	0.49	0.43	0.34	0.00	0.65	0.65	0.49	0.45	0.51	0.63	0.67	0.68	0.00						
32	Total 17 & 26 to 31				17.66	24.10	26.45	20.61	15.95	8.72	7.09	6.58	5.82	2.39	6.69	7.88	8.41	7.68	7.78	16.55	22.67	31.29	34.32	32.27	22.23	14.02	2.00	0.66	
33	Loss 5 %				0.88	1.20	1.32	1.03	0.80	0.44	0.35	0.33	0.29	0.12	0.33	0.39	0.42	0.38	0.83	1.13	1.56	1.72	1.61	1.11	0.70	0.10	0.10	0.03	
34	Macan weir demand				18.54	25.30	27.77	21.64	16.75	9.15	7.45	6.91	6.11	2.51	7.03	8.27	8.83	8.07	8.17	17.38	23.80	32.85	36.03	33.88	23.34	14.72	2.10	0.69	
35	Macan weir supply				1.05	3.80	4.90	5.52	6.45	6.81	9.99	12.04	9.14	9.31	10.46	13.23	11.91	10.50	10.30	10.12	9.50	9.32	9.12	7.99	5.20	1.19	1.16	0.97	
36	Needed supply				17.50	21.50	22.87	16.12	10.29	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.26	14.30	23.53	26.91	25.89	18.14	13.53	0.94	0.00	

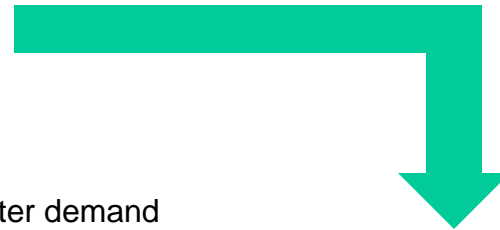
No	Area	Golongan	Extensive (hectare)		Water Demand (m3/sec)																								
					October		November		December		January		February		March		April		May		June		July		August		September		
			Rendeng	Gadu	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
37	Jengkol	I	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
38	Jengkol	II	720	720		0.73	0.68	0.49	0.40	0.38	0.35	0.37	0.35	0.27	0.00	0.53	0.52	0.42	0.40	0.46	0.56	0.63	0.61	0.00					
39	Jengkol	III	1,700	1,700			1.62	1.53	1.07	0.88	0.83	0.80	0.88	0.80	0.63	0.00	1.22	1.28	1.05	1.04	1.21	1.53	1.63	1.58	0.00				
40	Jengkol	IV	987	987				0.89	0.84	0.59	0.48	0.46	0.45	0.49	0.46	0.39	0.00	0.74	0.77	0.68	0.68	0.81	0.98	1.03	0.94	0.00			
41	Residue of gadu 2004	VIII		3,083	2.90	2.50	2.07																						
42	Residue of gadu 2004	IX		3,401	3.13	2.62	2.35	1.80																					
41	Total 37 to 42				6.03	5.84	6.71	4.71	2.31	1.86	1.67	1.64	1.68	1.56	1.09	0.92	1.74	2.43	2.22	2.18	2.45	2.97	3.22	2.61	0.94	0.00	0.00	0.00	
42	Loss 5 %				0.30	0.29	0.34	0.24	0.12	0.09	0.08	0.08	0.08	0.08	0.05	0.05	0.09	0.12	0.11	0.11	0.12	0.15	0.16	0.13	0.05	0.00	0.00	0.00	
43	Jengkol weir demand				6.33	6.14	7.05	4.95	2.42	1.95	1.75	1.72	1.77	1.64	1.15	0.97	1.83	2.55	2.33	2.29	2.57	3.11	3.38	2.74	0.98	0.00	0.00	0.00	
44	Jengkol weir supply				0.66	3.90	5.40	7.43	5.99	6.09	9.28	7.95	8.52	8.24	7.73	9.15	9.62	7.56	7.41	6.90	6.01	5.98	5.81	3.20	1.40	0.84	0.45	0.35	
45	Needed supply				5.67	2.24	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
46	Barugbug + Pundong	II	0	0				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
47	Barugbug + Pundong	III	6,197	6,197				5.89	5.58	3.90	3.22	3.04	2.91	3.22	2.91	2.29	0.00	4.46	4.65	3.84	3.78	4.40	5.58	5.95	5.76	0.00			
48	Barugbug + Pundong	IV	1,627	1,627				1.46	1.38	0.98	0.80	0.76	0.75	0.81	0.76	0.65	0.00	1.22	1.27	1.12	1.12	1.33	1.61	1.69	1.55	0.00			
49	East Tarum 22 to 41	I	1,314	1,314	1.39	1.33	1.01	0.80	0.74	0.70	0.72	0.63	0.50	0.00	0.96	0.96	0.72	0.66	0.75	0.93	0.99	1.00	0.00						
50	East Tarum 22 to 41	II	5,375	5,375		5.43	5.11	3.66	2.96	2.85	2.63	2.80	2.58	1.99	0.00	3.92	3.87	3.12	2.96	3.44	4.19	4.68	4.57	0.00					
51	East Tarum 22 to 41	III	664	664				0.63	0.60	0.42	0.35	0.33	0.31	0.35	0.31	0.25	0.00	0.48	0.50	0.41	0.41	0.47	0.60	0.64	0.62	0.00			
52	East Tarum 22 to 41	IV	0	0				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
53	Other crop (Palawija)	I		8,215																						2.46	3.45	4.35	1.89
54	PT Sang Hyang Seri				1.37	1.37	2.09	2.09	1.62	1.62	1.38	1.38	1.16	1.16	1.51	1.51	1.69	1.69	1.76	1.76	2.11	2.11	2.50	2.66	1.99	0.67	0.00	0.00	
55	Puslitbangperta				0.52	0.48	0.45	0.41	0.32	0.26	0.25	0.24	0.26	0.24	0.19	0.18	0.36	0.38	0.31	0.31	0.36	0.45	0.48	0.49	0.44	0.00	0.00	0.00	
56	PG PTPN VIII				0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.20	0.20	0.20	
57	Total 45 to 56 and 36				26.65	32.45	39.79	30.82	21.73	12.41	9.24	9.14	8.91	7.52	6.06	7.32	11.69	12.31	11.39	19.11	28.04	39.37	42.76	37.21	24.78	17.85	5.50	2.09	
58	Loss 5 %				1.33	1.62	1.99	1.54	1.09	0.62	0.46	0.46	0.45	0.38	0.30	0.37	0.58	0.62	0.57	0.96	1.40	1.97	2.14	1.86	1.24	0.89	0.27	0.10	
59	Barugbug weir demand				27.98	34.07	41.78	32.36	22.82	13.03	9.71	9.59	9.36	7.90	6.36	7.69	12.27	12.93	11.96	20.06	29.44	41.34	44.90	39.08	26.02	18.74	5.77	2.19	
60	Barugbug weir supply				0.64	4.50	6.01	9.05	7.44	10.69	14.78	20.25	14.93	12.83	12.48	18.83	16.99	14.23	7.87	6.50	6.00	5.90	5.60	4.50	1.25	0.57	0.53	0.63	
61	Needed supply				27.34	29.57	35.77	23.31	15.38	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.09	13.56	23.44	35.44	39.30	34.58	24.77	18.17	5.24	1.56	
62	East Tarum 1 - 21	I	5,036	5,036	5.34	5.09	3.88	3.07	2.82	2.67	2.77	2.42	1.91	0.00	3.68	3.68	2.77	2.52	2.87	3.58	3.78	3.83	0.00						
63	East Tarum 1 - 21	II	3,696	3,696		3.73	3.51	2.51	2.03	1.96	1.81	1.92	1.77	1.37	0.00	2.70	2.66	2.14	2.03	2.37	2.88	3.22	3.14	0.00					
64	East Tarum 1 - 21	III	1,967	1,967				1.87	1.77	1.24	1.02	0.96	0.92	1.02	0.92	0.73	0.00	1.42	1.48	1.22	1.20	1.40	1.77	1.89	1.83	0.00			
65	Palawija			4,670																						1.40	1.96	2.48	1.07
66	DMI				0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	
67	Total 61 to 66				32.94	38.65	45.29	30.92	21.73	8.25	5.80	5.52	4.97	2.55	4.66	6.63	7.11	6.40	10.48	20.96	31.76	44.51	44.59	36.66	26.43	20.40	7.98	2.90	
68	Loss 5 %				1.65	1.93	2.26	1.55	1.09	0.41	0.29	0.28	0.25	0.13	0.23	0.33	0.36	0.32	0.52	1.05	1.59	2.23	2.23	1.83	1.32	1.02	0.40	0.14	
69	Losses cause physic				9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
70	Addition from Curug weir				43.59	49.58	56.55	41.47	31.81	17.67	15.09	14.80	14.22	11.68	13.90	15.97	16.46	15.72	20.00	31.01	42.35	55.74	55.81	47.50	36.75	30.42	17.37	12.04	
71	Curug weir supply				45.00	52.50	55.00	45.00	35.00	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	20.00	45.00	45.00	55.00	55.00	52.50	35.00	35.00	17.50	17.50	
72	Add in Curug weir				62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50
73	<b>BALANCE</b>				17.50	10.00	7.50	17.50	27.50	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	42.50	17.50	17.50	7.50	7.50	10.00	27.50	27.50	45.00	45.00	

# Evaluation of Citarum Water Operation

SUPPLY	Dry S.	Wet S.
Local sources	30%	70%
Reservoirs	70%	30%

Note:

Using schematic water resources infrastructures with water demand in specific location, water requirement from Jatiluhur reservoir is computed

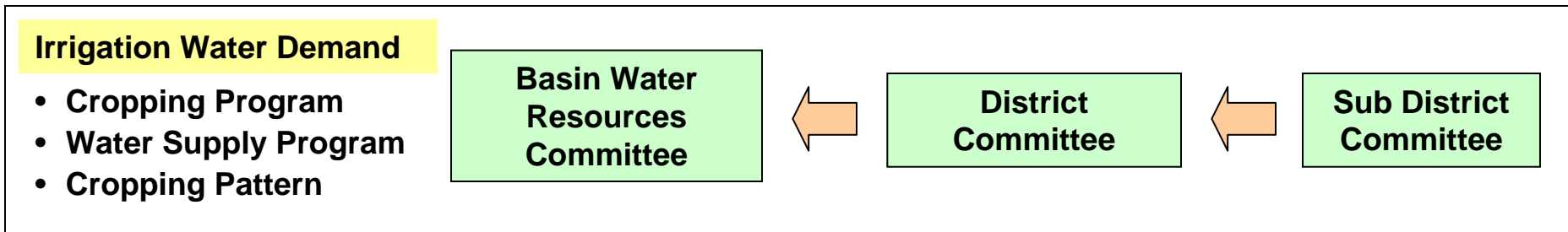


**CITARUM CASCADE RESERVOIRS OPERATION**  
(Saguling, Cirata, and Jatiluhur Reservoirs)

**DEMAND**

- D M I
- Irrigation

Bi-weekly (Internal) }  
Monthly (Coordination) } **Monitoring**





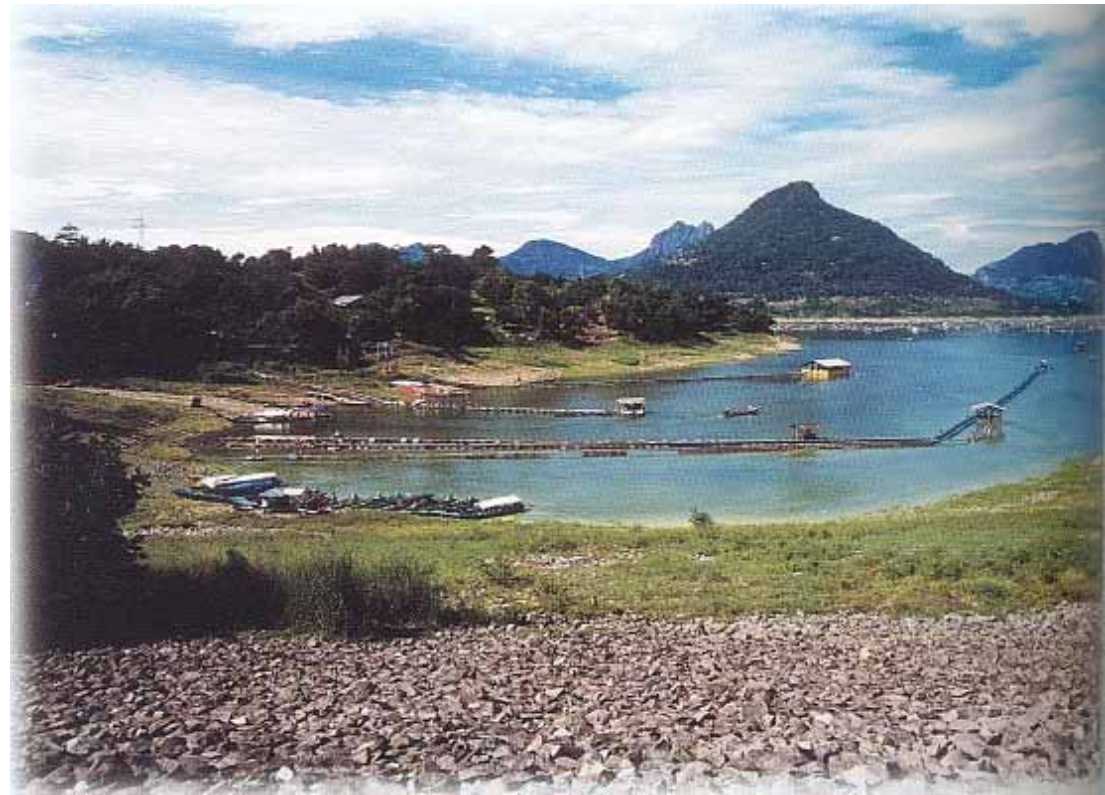
# CONCLUSION

Citarum water covered 9 (nine) District administration and 3 (three) Municipalities of West Java and Jakarta Provinces. Most of the source of water initiated from West Java Province and utilized for irrigation, domestics, municipalities and industries in West Java Provincial area. Besides, its also supply water for Jakarta Special District of Capital City, means served across provincial administrative boundary. The basin is considered strategic at national level for which its managed by The Central Government.

About half of the current population of the basin more than 16 million people live in urban areas. Current domestic and municipal water demands in the Citarum basin are estimated at 530 million m<sup>3</sup> annually.

For optimal used of water and evenly distributed to all beneficiaries need a water technologies for the sustainability of Water Management that we hope we will receive from this training so we could used in Citarum water resources management.

# THANK YOU



JASA TIRTA II PUBLIC CORPORATION

*Head Office:*

Jatiluhur – Purwakarta WEST JAVA, Phone : +62264201972 hunting, Faximile : +62264201971

[http: www.jasatirta2.co.id](http://www.jasatirta2.co.id)