CHAPTER VII

INDONESIAN WATER RESOURCE DEVELOPMENT PLAN IN WESTERN AREA OF JAKARTA

RENCANA PEMENUHAN KEBUTUHAN AIR BAKU
SE - JABOTEBEK TAHUN 2005

RENCANA PEMENUHAN KEBUTUHAN AIR BAKU
SE-JABOTABEK TAHUN 2005

I. PENDAHULUAN

Dalam rangka penyusunan strategi pembangunan di wilayah Jabotabek telah disusun suatu wilayah pengembangan yang terdiri dari 22 cluster.

Pengembangan tersebut memerlukan dukungan dari berbagai sektor antara lain jaringan jalan serta ketersediaan air baku untuk kepentingan air bersih bagi perkotaan dan industri.

Khusus untuk sektor air bersih diperkirakan kebutuhan air baku akan meningkat hampir 50% yaitu dari ± 62.285 l/det untuk tahun 1995 menjadi ± 91.500 l/det pada tahun 2005.
Adapun jenis sumber dan perkiraan asal sumber dapat dilihat pada tabel 1.

II. PERMASALAHAN / KONDISI YANG ADA

Berdasarkan data dan informasi yang didapat dari Ditjen. Pengairan, dalam upaya pemenuhan kebutuhan air baku tahun 2005 ditemui beberapa permasalahan, antara lain sebagai berikut :

1. Untuk air tanah, keberadaannya tidak merata, baik dari segi kuantitas maupun kwalitas. Di daerah Jabotabek sebelah utara kapasitas air tanah yang dapat diambil sangat terbatas dan kwalitasnya kebanyakan tidak layak diminum (kadar salinity dan Fe tinggi).

III. UPAYA PEMECAHAN MASALAH

Dalam rangka memenuhi kebutuhan air baku pada tahun 2005 perlu diupayakan hal-hal sebagai berikut :

1. Pembuatan bendung karet di Sungai Cidurian, Cisadane, Cimandiri dan di Sungai Bekasi / Cikarang bagian utara.

2. Peningkatan (up-grading) saluran-saluran pembawa yang ada, khususnya Kanal Tarum Barat.

3. Peningkatan effisiensi penggunaan air irigasi dengan cara :
   a. Melakukan evaluasi kembali terhadap adanya perubahan fungsi sawah menjadi daerah permukaan dan industri.
   b. Melakukan penyuluhan kepada petani dalam rangka penghematan pemakaian air.

DAFTAR KEBUTUHAN AIR BAKU UNTUK PERKOTAAN & INDUSTRI
WILAYAH JABOTABEK TAHUN 1995 S/D 2005

Tabel 1

NO.	NAMA CLUSTER	JUMLAH PENDUDUK		KEBUTUHAN AIR BAKU (LITER/DETIK)						PERKIRAAN ASAL SUMBER AIR BAKU
		1995 (JIWA)	2005 (JIWA)	1995			2005			
				AT	AP	TOTAL	AT	AP	TOTAL	
1	DKI JAKARTA	8.964.000	10.487.000	18.547	15.321	33.868	14.658	31.400	46.058	Cisadane, Pasanggrahan, Krutut, WTC, MA Ciburial
2	BEKASI	809.875	1.146.820	1.340	917	2.257	1.426	2.140	3.566	Bekasi, WTC
3	MUARA GEMBONG	425.000	569.370	805	106	911	755	340	1.095	Cikarang
4	TAMBUN	340.840	549.680	890	1.165	2.055	1.122	1.120	2.242	WTC
5	CIKARANG	216.470	305.360	321	380	701	308	600	908	WTC, Cikarang
6	SETU	201.550	255.580	439	259	698	1.468	310	1.778	Cikarang, Cibeet
7	PONDOK GEDE	443.510	794.260	834	259	1.093	1.468	650	2.118	WTC, Air Tanah
8	DEPOK	1.034.650	1.531.540	1.474	553	2.027	1.559	2.050	3.609	Ciliwung, Cikeas, MA Ciburial,Air Tanah
9	CILEUNGSI	347.700	532.780	1.187	604	1.791	1.791	1.100	2.891	Cileungsi,MA Sodong, Air Tanah
10	JONGGOL	228.060	371.490	397	92	489	519	490	1.009	Ciliwung, Cibarang
11	BOGOR	1.543.230	1.948.640	1.906	730	2.636	1.667	2.270	3.937	Cisadane, Ciliwung, MA Ciburial & MA Bogor
12	CIBINONG	543.100	829.440	1.340	604	1.944	2.126	1.030	3.156	Ciliwung, Cikeas, Air Tanah
13	JASINGA	597.340	736.040	843	134	977	489	450	939	Cidurian, Cimanciri
14	PARUNG	425.920	661.440	647	86	733	956	470	1.426	Cisadane, Air Tanah
15	TANGERANG	1.119.205	1.837.960	2.093	1.482	3.575	2.546	3.330	5.876	Cisadane
16	CIPUTAT	964.450	1.518.270	1.626	115	1.741	2.302	860	3.162	Cisadane, Air Tanah
17	SERPONG	164.990	221.730	272	60	332	336	290	626	Cisadane, Air Tanah
18	CURUG	264.800	373.520	572	261	833	746	520	1.266	Cisadane, Air Tanah
19	CIKUPA	345.750	511.790	1.402	1.035	2.437	1.629	1.430	3.059	Cidurian
20	BALARAJA	303.970	429.190	628	230	858	536	790	1.326	Cidurian
21	KRONJO	283.530	366.140	368	8	376	429	190	619	Cidurian
22	TELUKNAGA	335.510	464.200	489	4	493	514	330	844	Cisadane
	TOTAL	19.903.450	26.442.240	38.420	24.405	62.825	39.350	52.160	91.510	

FILE:AIRBAKU CCP

DAFTAR KEBUTUHAN DAN ALOKASI AIR BAKU
TAHUN 2005

Tabel - 7

No	KAWASAN (Cluster)	TOTAL KEBUTUHAN AIR BAKU (l/det)	Air Baku Untuk IPA 1995	Air Baku Untuk IPA 2005	NAMA SUNGAI/SUMBER AIR: Ciliwung (l/det)	Cisadane (l/det)	Krukut (l/det)	Grogol (l/det)	Cisadane (l/det)	Angke (l/det)	Pesanggrahan (l/det)	Ciliwung (l/det)	Cibeas (l/det)	Cileungsi (l/det)	Bekasi (l/det)	Cikarang (l/det)	Cibeet (l/det)	Citarum (l/det)	Kanal Tarum Barat (l/det)	Mata Air Ciburial (l/det)	Mata Air Sodong (l/det)	Mata air/sekitar Kodya Bogor (l/det)
I	DKI Jakarta	31,400	19,200	12,200	-	-	200	-	2,000	-	200	-	-	-	-	-	-	-	29,050	100	-	-
II	Bekasi	2,140	500	1,640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,140	-	-	-
III	Muara Gembong	340	-	340	-	-	-	-	-	-	-	-	-	-	-	340	-	-	-	-	-	-
IV	Tambun	1,120	50	1,070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,120	-	-	-
V	Cikarang	600	80	520	-	-	-	-	-	-	-	-	-	-	-	150	-	-	450	-	-	-
VI	Setu	310	-	310	-	-	-	-	-	-	-	-	-	-	-	310	-	-	-	-	-	-
VII	Pondok Gede	650	-	650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	650	-	-	-
VIII	Depok	2,050	590	1,460	-	-	-	-	-	-	-	700	1,550	-	-	-	-	-	-	300	-	-
IX	Cileungsi	1,100	25	1,075	-	-	-	-	-	-	-	-	-	850	-	-	-	-	-	-	250	-
X	Jonggol	490	-	490	-	-	-	-	-	-	-	-	-	-	-	490	-	-	-	-	-	-
XI	Bogor	2,270	520	1,750	-	-	-	-	520	-	-	-	1,250	-	-	-	-	-	-	100	-	400
XII	Cibinong/B.Gede	1,030	100	930	-	-	-	-	-	-	-	-	1,030	-	-	-	-	-	-	-	-	-
XIII	Jasinga	450	-	450	270	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XIV	Parung	470	-	470	-	-	-	-	470	-	-	-	-	-	-	-	-	-	-	-	-	-
XV	Tangerang	3,330	1,250	2,080	-	-	-	-	3,330	-	-	-	-	-	-	-	-	-	-	-	-	-
XVI	Ciputat	850	-	850	-	-	-	-	850	-	-	-	-	-	-	-	-	-	-	-	-	-
XVII	Serpong	290	240	50	-	-	-	-	290	-	-	-	-	-	-	-	-	-	-	-	-	-
XVIII	Curug	520	-	520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XIX	Cikupa	1,430	-	1,430	1,430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XX	Balaraja/T. Raksa	790	50	740	790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XXI	Kronjo/Mauk	190	-	190	150	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XXII	Teluk Naga	330	60	270	-	-	-	-	330	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	52,160	22,666	29,495																		
	Total Kebutuhan Air Baku		US		270	180	200	-	520	-	200	3,830	850	-	-	800	-	-	-	400	250	400
				DS	2,370	40			6,750		200	0	-	-	-	490	-	-	33,410	100	-	-
	Ketersediaan Air Baku		US		270	180	200	-	1,500	-	200	3,830	1,700	-	-	800	-	-	-	450	350	400
				DS	400	50			5,000		250	0	-			250			31,100	100		
	Sisa / (kekurangan)		US		-	-	-	-	880	-	-	-	850	-	-	-	-	-	-	50	100	-
				DS	(1,970)	10	-	-	(1,750)	-	50	-	-			(240)			(2,310)	-	-	-
	USULAN PENANGANAN AIR BAKU	Pemanfaatan alokasi			C1	C1			C1							C1			C4			
		Penambahan alokasi			C3				C3							C3			C3			

Catatan

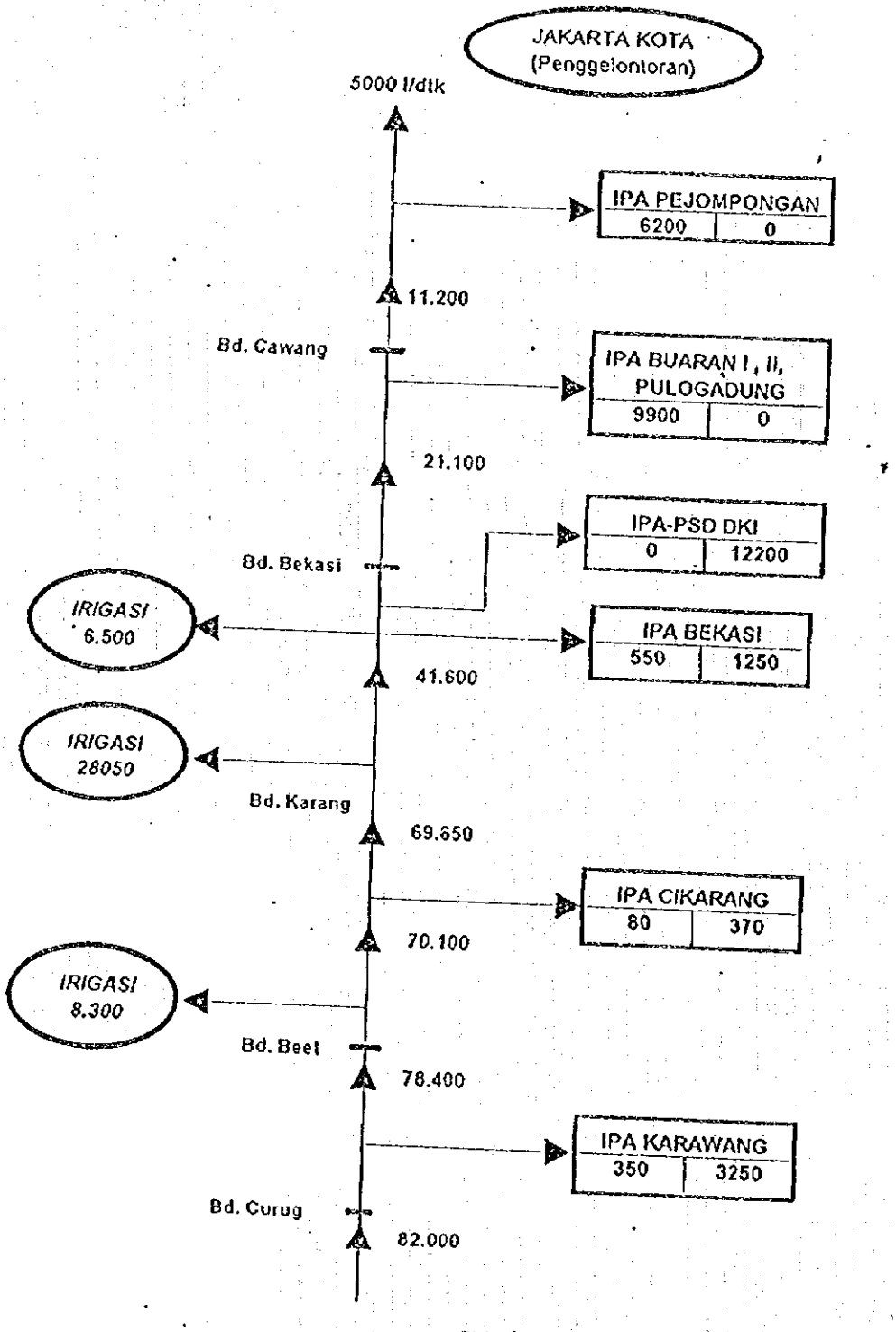
C1 = Pembangunan bendung karet/Long Storage
C2 = Menaikkan muka air/long
C3 = Efisiensi irigasi
C4 = Up grading saluran
US = Up Stream
DS = Down Stream

ALIRAN MINIMUM TAHUN 2005

TABEL 3.

Branch NO.	NAMA SUNGAI	LOKASI	DEBIT MINIMUM (M3/DT)		KETERANGAN
			RATA-RATA	ABSOLUT MINIMUM	
214	Cidurian	Muara	6,30	1,81	
3	Cimanciri	Muara	2,70	0,34	
455	Cirarab	Muara	2,28	1,12	
469	Cisadane	Muara	9,22	0,10	
7	Cisadane	Masuk Bd Ps Baru	21,94	2,72	
479	Pasanggrahan	Muara	4,12	1,21	
527	Ciliwung	Muara	4,07	1,09	
572	Bekasi	Muara	0,00	0,00	
44	Bekasi	Masuk Bd Bekasi	5,42	1,53	
539	Cikarang	Muara	0,29	0,00	
20	Cipamingkis	Muara	3,05	0,69	

Sumber : Dit. Jen. Pengairan Tahun 1996



SISTEM KANAL TARUM BARAT TAHUN 2005

KETERANGAN :

A	
B	C

A : Nama Lokasi
B : Kapasitas Existing
c : Kapasitas Rencana tahun 2005

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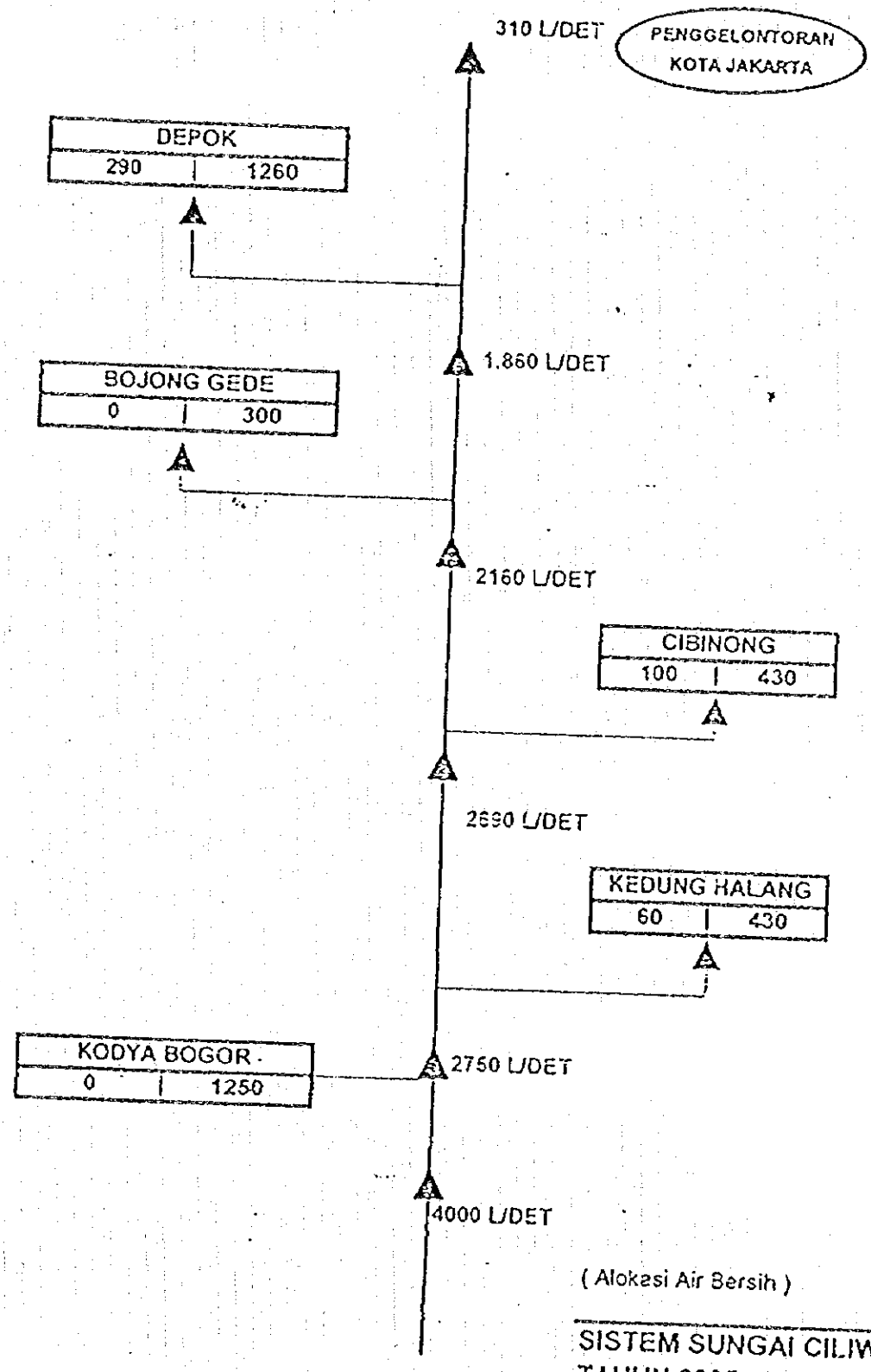

(Alokasi Air Bersih)

SISTEM SUNGAI CILIWUNG
TAHUN 2005

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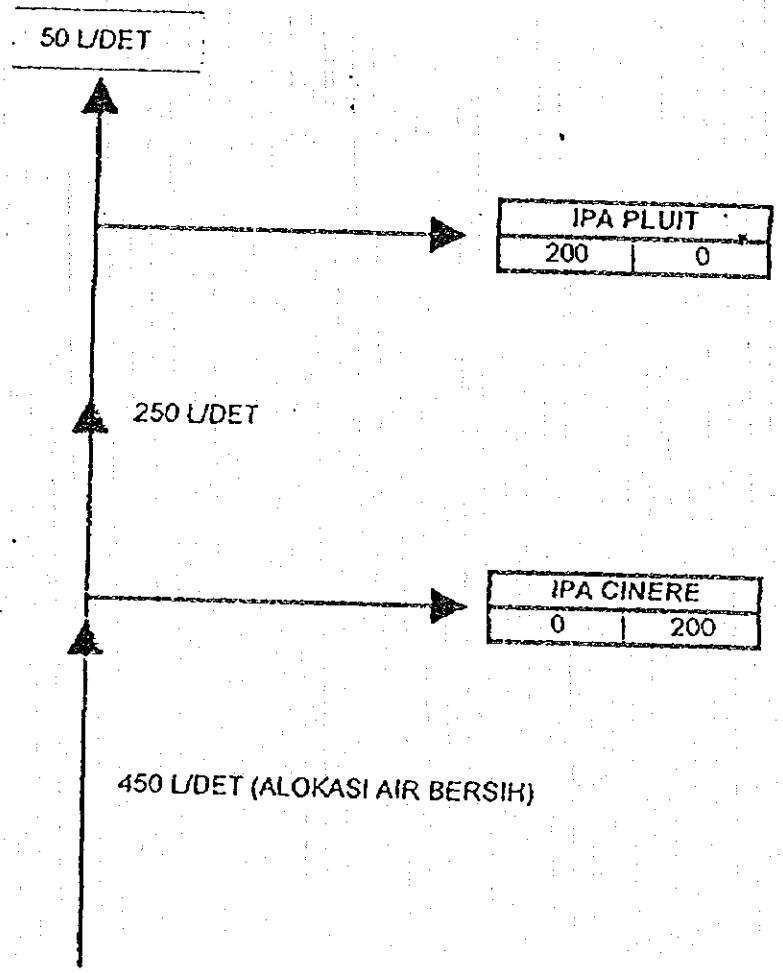
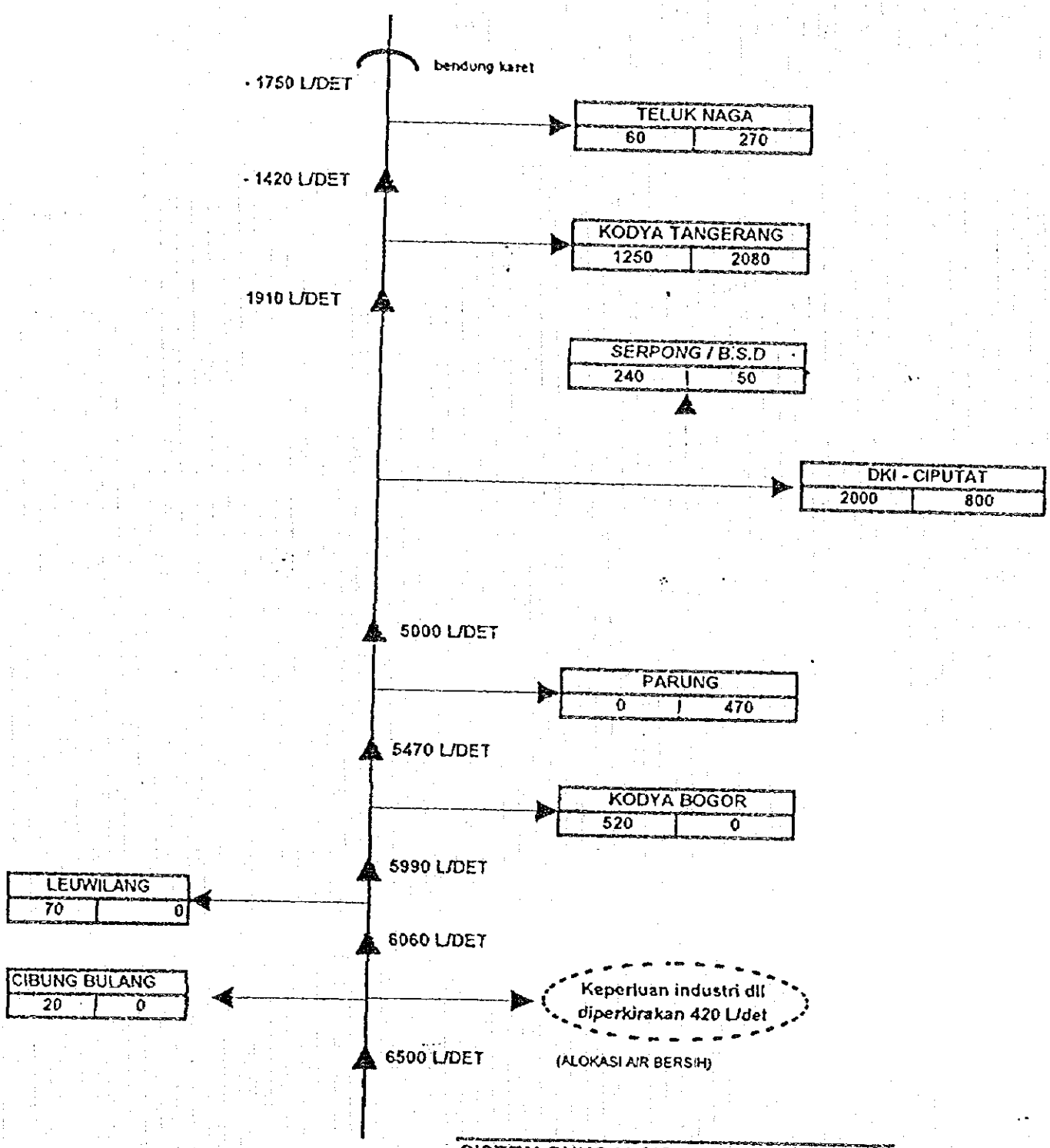


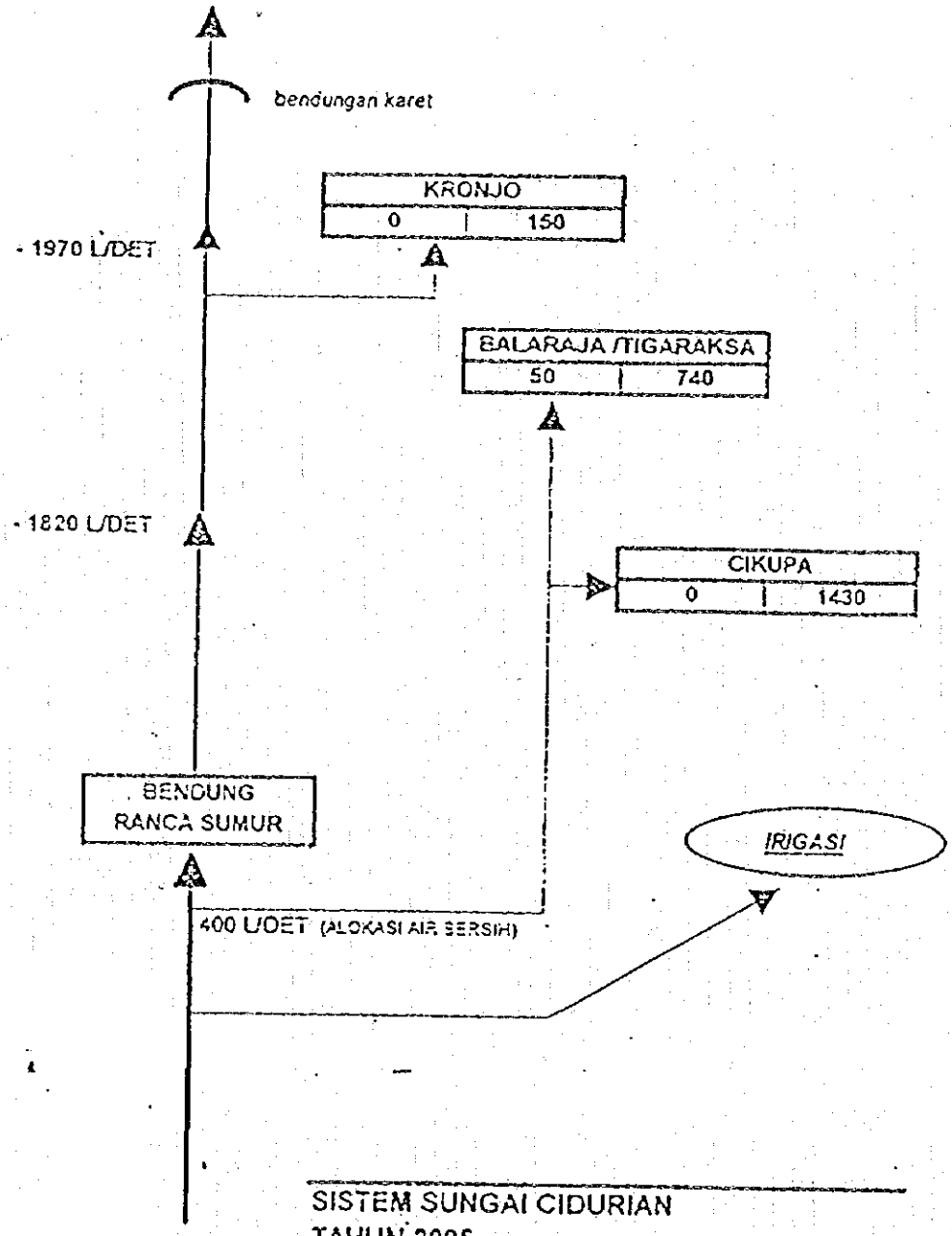
SISTEM SUNGAI PESANGGRAHAN
TAHUN 2005



SISTEM SUNGAI CISADANE TAHUN 2005

CATATAN :

- Untuk memenuhi kebutuhan air bersih tahun 2005, alokasi air baku dari sungai Cisadane mengalami defisit sebesar 1750 L/det



SISTEM SUNGAI CIDURIAN
TAHUN 2005

CATATAN :
- Untuk memenuhi kebutuhan air bersih tahun 2005, alokasi air baku dari Sungai Cidurian mengalami defisit sebesar 1970 l/det.

TABLES

TABLE 4.29 ANNUAL FUND REQUIREMENT FOR SCENARIO I

(Unit : US$ 10^3)

Year	Upgrading of WTC	Karian Dam/ KSCS	Conveyance 2-Phase II	Pasir Kopo Dam	Conveyance 2-Phase II	Tanjung Dam	Total
1,995							
1,996							
1,997							
1,998							
1,999	7,000						7,000
2,000	14,000						14,000
2,001	9,000	100,080					109,080
2,002		150,120					150,120
2,003		125,100					125,100
2,004		100,080					100,080
2,005		25,020	112,500	27,360			164,880
2,006			157,500	41,040			198,540
2,007			112,500	34,200			146,700
2,008			67,500	27,360			94,860
2,009				6,840	80,000		86,840
2,010					144,000		144,000
2,011					96,000	136,120	232,120
2,012						204,180	204,180
2,013						170,150	170,150
2,014						136,120	136,120
2,015						34,030	34,030
2,016							
2,017							
2,018							
2,019							
Total	*30,000*	*500,400*	*450,000*	*136,800*	*320,000*	*680,600*	*2,117,800*

TABLE 4.30 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO I
(1/3)

Item	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
I. Annual Cost											
1. West Tarum Canal	6,042	6,355	6,668	6,977	7,003	7,003	7,003	7,003	7,003	7,003	7,003
2. Upgrading of West Tarum Canal											
(1) Repayment	0	0	0	0	0	0	0	900	900	900	900
(2) O & M Cost	0	0	0	0	0	0	0	150	150	150	150
Sub-total	0	0	0	0	0	0	0	1,050	1,050	1,050	1,050
3. Karian Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
4. Conveyance 2 - Phase I											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
5. Conveyance 2 - Phase II											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
6. Tanjung Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
Total Annual Cost	*6,042*	*6,355*	*6,668*	*6,977*	*7,003*	*7,003*	*7,003*	*8,053*	*8,053*	*8,053*	*8,053*
II. Water Demand (m^3/sec)	13.89	14.61	15.33	16.04	16.76	17.47	18.46	19.45	20.44	21.43	22.42
III. Unit Raw Water Cost											
(US10^3/m^3/sec)	435	435	435	435	418	401	379	414	394	376	359
(Rp10^6/m^3/sec)	946	946	946	946	909	872	825	901	857	817	781
(Rp/m^3)	30	30	30	30	29	28	26	29	27	26	25

TABLE 4.30 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO I

(2/3)

Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
I. Annual Cost											
1. West Tarum Canal	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003
2. Upgrading of West Tarum Canal											
(1) Repayment	900	900	900	900	900	900	900	2,016	2,016	2,016	2,016
(2) O & M Cost	150	150	150	150	150	150	150	150	150	150	150
Sub-total	1,050	1,050	1,050	1,050	1,050	1,050	1,050	2,166	2,166	2,166	2,166
3. Karian Dam & KSCS											
(1) Repayment	0	15,012	15,012	15,012	15,012	15,012	15,012	15,012	15,012	15,012	15,012
(2) O & M Cost	0	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502	2,502
Sub-total	0	17,514	17,514	17,514	17,514	17,514	17,514	17,514	17,514	17,514	17,514
4. Conveyance 2 - Phase I											
(1) Repayment	0	0	0	0	13,500	13,500	13,500	13,500	13,500	13,500	13,500
(2) O & M Cost	0	0	0	0	2,250	2,250	2,250	2,250	2,250	2,250	2,250
Sub-total	0	0	0	0	15,750	15,750	15,750	15,750	15,750	15,750	15,750
5. Conveyance 2 - Phase II											
(1) Repayment	0	0	0	0	0	0	0	9,600	9,600	9,600	9,600
(2) O & M Cost	0	0	0	0	0	0	0	1,600	1,600	1,600	1,600
Sub-total	0	0	0	0	0	0	0	11,200	11,200	11,200	11,200
6. Tanjung Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
Total Annual Cost	*8,053*	*25,567*	*25,567*	*25,567*	*41,317*	*41,317*	*41,317*	*53,634*	*53,634*	*53,634*	*53,634*
II. Water Demand (m^3/sec)	22.42	32.47	34.33	37.22	42.21	44.82	47.91	50.92	53.81	69.85	73.08
II. Unit Raw Water Cost											
(US$10^3/m^3$/sec)	359	787	745	687	979	922	862	1,053	997	768	734
(Rp$10^3/m^3$/sec)	781	1,713	1,620	1,494	2,129	2,005	1,876	2,291	2,168	1,670	1,596
(Rp/m^3)	25	54	51	47	68	64	59	73	69	53	51

TABLE 4.30 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO I
(3/3)

Item	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
I. Annual Cost											
1. West Tarum Canal	7,003	7,003	7,003	7,003	7,003						
2. Upgrading of West Tarum Canal											
(1) Repayment	2,016	2,016	2,016	2,016	2,016						
(2) O & M Cost	150	150	150	150	150						
Sub-total	2,166	2,166	2,166	2,166	2,166						
3. Karian Dam & KSCS											
(1) Repayment	15,012	33,635	33,635	33,635	33,635						
(2) O & M Cost	2,502	2,502	2,502	2,502	2,502						
Sub-total	17,514	36,137	36,137	36,137	36,137						
4. Conveyance 2 - Phase I											
(1) Repayment	13,500	13,500	13,500	13,500	21,509						
(2) O & M Cost	2,250	2,250	2,250	2,250	2,250						
Sub-total	15,750	15,750	15,750	15,750	23,759						
5. Conveyance 2 - Phase II											
(1) Repayment	9,600	9,600	9,600	9,600	9,600						
(2) O & M Cost	1,600	1,600	1,600	1,600	1,600						
Sub-total	11,200	11,200	11,200	11,200	11,200						
6. Tanjung Dam & KSCS											
(1) Repayment	0	20,418	20,418	20,418	20,418						
(2) O & M Cost	0	3,403	3,403	3,403	3,403						
Sub-total	0	23,821	23,821	23,821	23,821						
Total Annual Cost	*53,634*	*96,077*	*96,077*	*96,077*	*104,086*						
II. Water Demand (m^3/sec)	73.08	75.61	78.18	80.44	82.81						
II. Unit Raw Water Cost											
(US$/$m^3$/sec)	734	1,271	1,229	1,194	1,257						
(Rp/m^3/sec)	1,596	2,764	2,673	2,598	2,734						
(Rp/m^3)	51	88	85	82	87						

TABLE 4.31 WATER DEMAND-SUPPLY BALANCE FOR DKI JAKARTA WATER SUPPLY SYSTEM FOR SCENARIO II (3/3)

(Unit : m^3/sec)

Item	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1. West Tarum Canal											
Potential Supply Discharge	21.10	21.10	21.10	21.10	21.10	21.10	21.10	26.10	26.10	26.10	26.10
Treatment Plant Capacity	*16.10*	*16.10*	*16.10*	*16.10*	*16.10*	*16.10*	*16.10*	*21.10*	*21.10*	*21.10*	*21.10*
2. Conveyance 2											
Potential Supply Discharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Treatment Plant Capacity	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3. KSCS											
Potential Supply Discharge	0.00	0.00	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Treatment Plant Capacity	*0.00*	*0.00*	*2.80*	*2.80*	*2.80*	*2.80*	*2.80*	*2.80*	*2.80*	*2.80*	*2.80*
4. Total Treatment Plant Capacity	16.10	16.10	18.90	18.90	18.90	18.90	18.90	23.90	23.90	23.90	23.90
5. Demand in DKI Jakarta	13.89	14.61	15.33	16.04	16.76	17.47 *1.0469*	18.46	19.45	20.44	21.43	22.42 *1.05112*
6. Balance (4.-5.)	2.21	1.49	3.57	2.86	2.14	1.43	0.44	4.45	3.46	2.47	1.48

TABLE 4.31 WATER DEMAND-SUPPLY BALANCE FOR DKI JAKARTA WATER SUPPLY SYSTEM FOR SCENARIO II (2/3)

(Unit : m^3/sec)

Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1. West Tarum Canal											
Potential Supply Discharge	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10
Treatment Plant Capacity	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*
2. Conveyance 2											
Potential Supply Discharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.95	11.75	11.54	11.33
Treatment Plant Capacity	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*10.70*	*10.70*	*10.70*	*10.70*
3. KSCS											
Potential Supply Discharge	2.80	2.80	2.80	2.80	7.64	10.39	9.89	9.47	9.16	17.74	17.18
Treatment Plant Capacity	*2.80*	*2.80*	*2.80*	*2.80*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*	*8.20*
4. Total Treatment Plant Capacity	28.90	28.90	28.90	28.90	34.30	34.30	34.30	45.00	45.00	45.00	45.00
5. Demand in DKI Jakarta	22.42	24.27	26.13	27.98	29.83	31.68 *1.07161*	34.06	36.44	38.82	41.20	43.58 *1.06583*
6. Balance (4.-5.)	1.48	4.63	2.77	0.92	4.47	2.62	0.24	8.56	6.18	3.80	1.42

TABLE 4.31 WATER DEMAND-SUPPLY BALANCE FOR DKI JAKARTA WATER SUPPLY SYSTEM FOR SCENARIO II (3/3)

(Unit : m^3/sec)

Item	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1. West Tarum Canal											
Potential Supply Discharge	26.10	26.10	26.10	26.10	26.10						
Treatment Plant Capacity	*26.10*	*26.10*	*26.10*	*26.10*	*26.10*						
2. Conveyance 2											
Potential Supply Discharge	11.33	11.22	11.01	10.90	10.70						
Treatment Plant Capacity	*10.70*	*10.70*	*10.70*	*10.70*	*10.70*						
3. KSCS											
Potential Supply Discharge	17.18	16.61	15.97	15.41	14.95						
Treatment Plant Capacity	*8.20*	*14.90*	*14.90*	*14.90*	*14.90*						
4. Total Treatment Plant Capacity	45.00	51.70	51.70	51.70	51.70						
5. Demand in DKI Jakarta	43.58	45.00	46.42	47.84	49.26 1.03113						
6. Balance (4.-5.)	1.42	6.70	5.28	3.86	2.44						

TABLE 4.32 ANNUAL FUND REQUIREMENT FOR SCENARIO II

(Unit : US$ 10^3)

Year	Upgrading of WTC	Karian Dam/ KSCS	Conveyance 2	Pasir Kopo Dam	Tanjung Dam	Total
1,995						
1,996						
1,997						
1,998						
1,999	7,000					7,000
2,000	14,000					14,000
2,001	9,000					9,000
2,002	15,000					15,000
2,003	25,000					25,000
2,004	35,000	100,080				135,080
2,005	25,000	150,120		27,360		202,480
2,006		125,100		41,040		166,140
2,007		100,080		34,200		134,280
2,008		25,020	150,000	27,360		202,380
2,009			210,000	6,840		216,840
2,010			150,000			150,000
2,011			90,000		136,120	226,120
2,012					204,180	204,180
2,013					170,150	170,150
2,014					136,120	136,120
2,015					34,030	34,030
2,016						
2,017						
2,018						
2,019						
Total	*130,000*	*500,400*	*600,000*	*136,800*	*680,600*	*2,047,800*

TABLE 4.33 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO II
(1/3)

Item	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
I. Annual Cost											
1. West Tarum Canal	6,042	6,355	6,668	6,977	7,003	7,003	7,003	7,003	7,003	7,003	7,003
2. Upgrading of West Tarum Canal											
(1) Repayment	0	0	0	0	0	0	0	900	900	900	900
(2) O & M Cost	0	0	0	0	0	0	0	150	150	150	150
Sub-total	0	0	0	0	0	0	0	1,050	1,050	1,050	1,050
3. Karian Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
4. Conveyance 2											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
6. Tanjung Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Annual Cost	*6,042*	*6,355*	*6,668*	*6,977*	*7,003*	*7,003*	*7,003*	*8,053*	*8,053*	*8,053*	*8,053*
II. Water Demand (m^3/sec)	13.89	14.61	15.33	16.04	16.76	17.47	18.46	19.45	20.44	21.43	22.42
III. Unit Raw Water Cost											
(US10^3/m^3/sec)	435	435	435	435	418	401	379	414	394	376	359
(Rp10^6/m^3/sec)	946	946	946	946	909	872	825	901	857	817	781
(Rp/m^3)	30	30	30	30	29	28	26	29	27	26	25

TABLE 4.33 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO II

(2/3)

Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
I. Annual Cost											
1. West Tarum Canal	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003	7,003
2. Upgrading of West Tarum Canal											
(1) Repayment	900	3,900	3,900	3,900	3,900	3,900	3,900	5,016	5,016	5,016	5,016
(2) O & M Cost	150	650	650	650	650	650	650	650	650	650	650
Sub-total	1,050	4,550	4,550	4,550	4,550	4,550	4,550	5,666	5,666	5,666	5,666
3. Karian Dam & KSCS											
(1) Repayment	0	0	0	0	15,012	15,012	15,012	15,012	15,012	15,012	15,012
(2) O & M Cost	0	0	0	0	2,502	2,502	2,502	2,502	2,502	2,502	2,502
Sub-total	0	0	0	0	17,514	17,514	17,514	17,514	17,514	17,514	17,514
4. Conveyance 2											
(1) Repayment	0	0	0	0	0	0	0	18,000	18,000	18,000	18,000
(2) O & M Cost	0	0	0	0	0	0	0	2,250	2,250	2,250	2,250
Sub-total	0	0	0	0	0	0	0	20,250	20,250	20,250	20,250
5. Tanjung Dam & KSCS											
(1) Repayment	0	0	0	0	0	0	0	0	0	0	0
(2) O & M Cost	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0
Total Annual Cost	*8,053*	*11,553*	*11,553*	*11,553*	*29,067*	*29,067*	*31,068*	*32,186*	*50,434*	*50,434*	*50,434*
II. Water Demand (m^3/sec)	22.42	32.47	34.33	37.22	42.21	44.82	47.91	50.92	53.81	69.85	73.08
II. Unit Raw Water Cost											
(US$10^3/m^3$/sec)	359	356	337	310	689	649	648	632	937	722	690
(Rp$10^6/m^3$/sec)	781	774	732	675	1,498	1,411	1,410	1,375	2,039	1,570	1,501
(Rp/m^3)	25	25	23	21	47	45	45	44	65	50	48

TABLE 4.33 ESTIMATE OF ANNUAL COST AND UNIT RAW WATER COST FOR SCENARIO II
(3/3)

Item	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
I. Annual Cost											
1. West Tarum Canal	7,003	7,003	7,003	7,003	7,003						
2. Upgrading of West Tarum Canal											
(1) Repayment	5,016	8,738	8,738	8,738	8,738						
(2) O & M Cost	650	650	650	650	650						
Sub-total	5,666	9,388	9,388	9,388	9,388						
3. Karian Dam & KSCS											
(1) Repayment	15,012	15,012	15,012	15,012	33,635						
(2) O & M Cost	2,502	2,502	2,502	2,502	2,502						
Sub-total	17,514	36,137	17,514	17,514	36,137						
4. Conveyance 2											
(1) Repayment	18,000	18,000	18,000	18,000	18,000	21,509					
(2) O & M Cost	2,250	2,250	2,250	2,250	2,250						
Sub-total	20,250	20,250	20,250	20,250	23,759						
5. Tanjung Dam & KSCS											
(1) Repayment	0	20,418	20,418	20,418	20,418						
(2) O & M Cost	0	3,403	3,403	3,403	3,403						
Sub-total	0	23,821	23,821	23,821	23,821						
Total Annual Cost	*50,434*	*96,599*	*77,976*	*77,976*	*100,108*						
II. Water Demand (m^3/sec)	73.08	75.61	78.18	80.44	82.81						
II. Unit Raw Water Cost											
(US$/$m^3$/sec)	690	1,278	997	969	1,209						
(Rp/m^3/sec)	1,501	2,779	2,169	2,108	2,629						
(Rp/m^3)	48	88	69	67	83						

FIGURES

FIG. 4.1 PROCEDURES FOR MASTER PLAN STUDY ON WATER RESOURCES DEVELOPMENT PLAN (1/2)

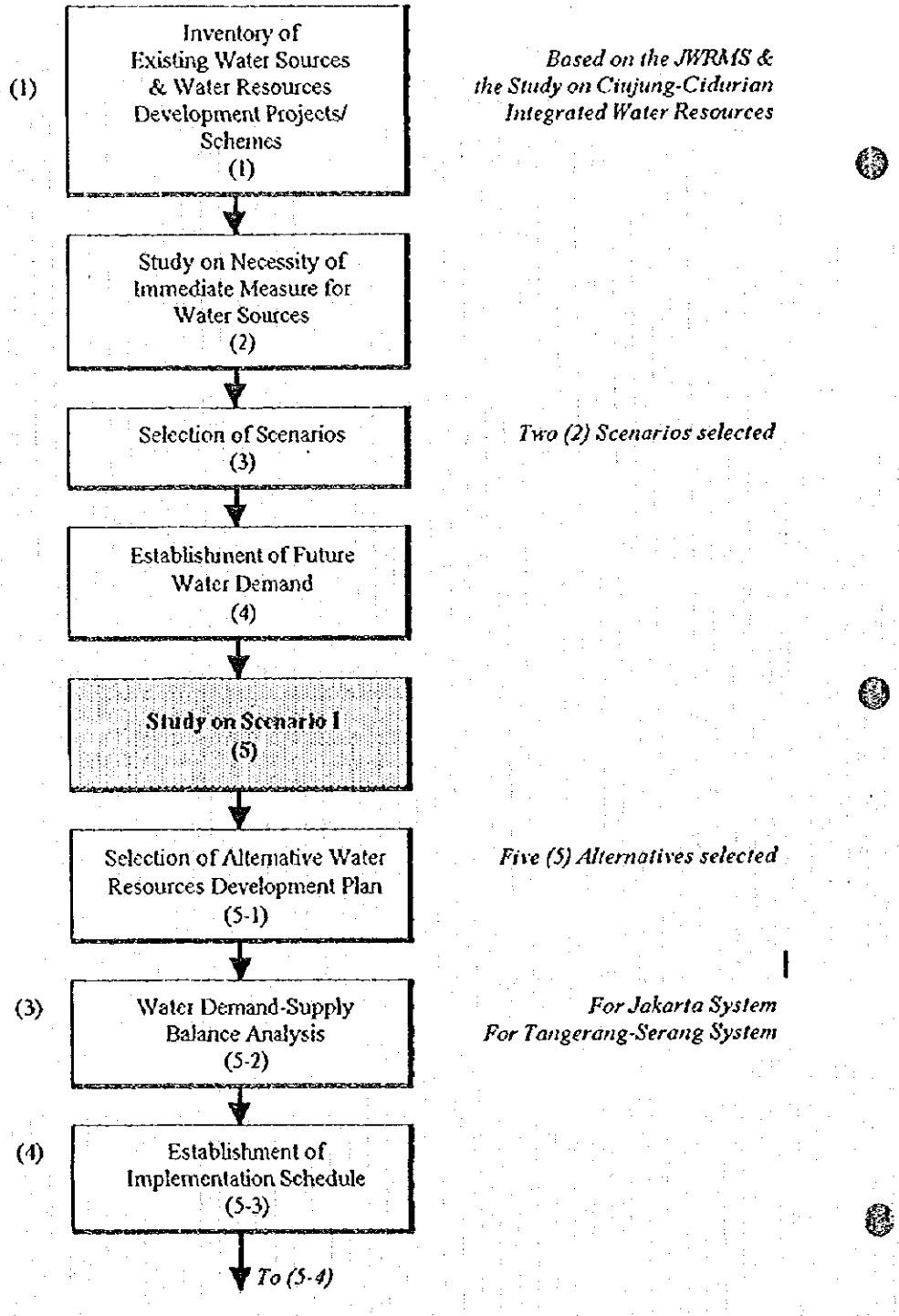


FIG. 4.1 PROCEDURES FOR MASTER PLAN STUDY ON WATER RESOURCES DEVELOPMENT PLAN (2/2)

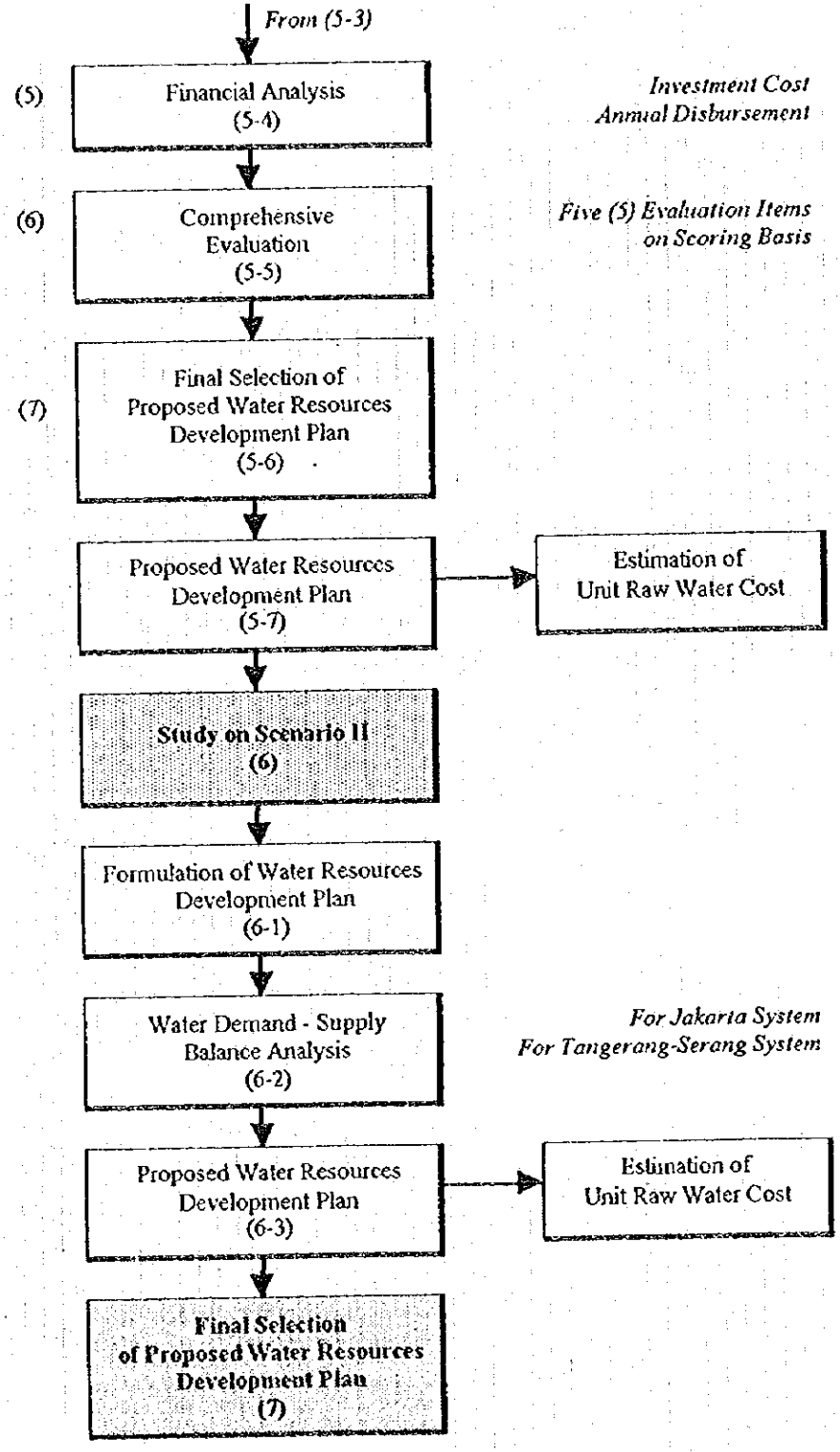


FIG. 4.2 ALTERNATIVE RAW WATER SUPPLY SYSTEMS

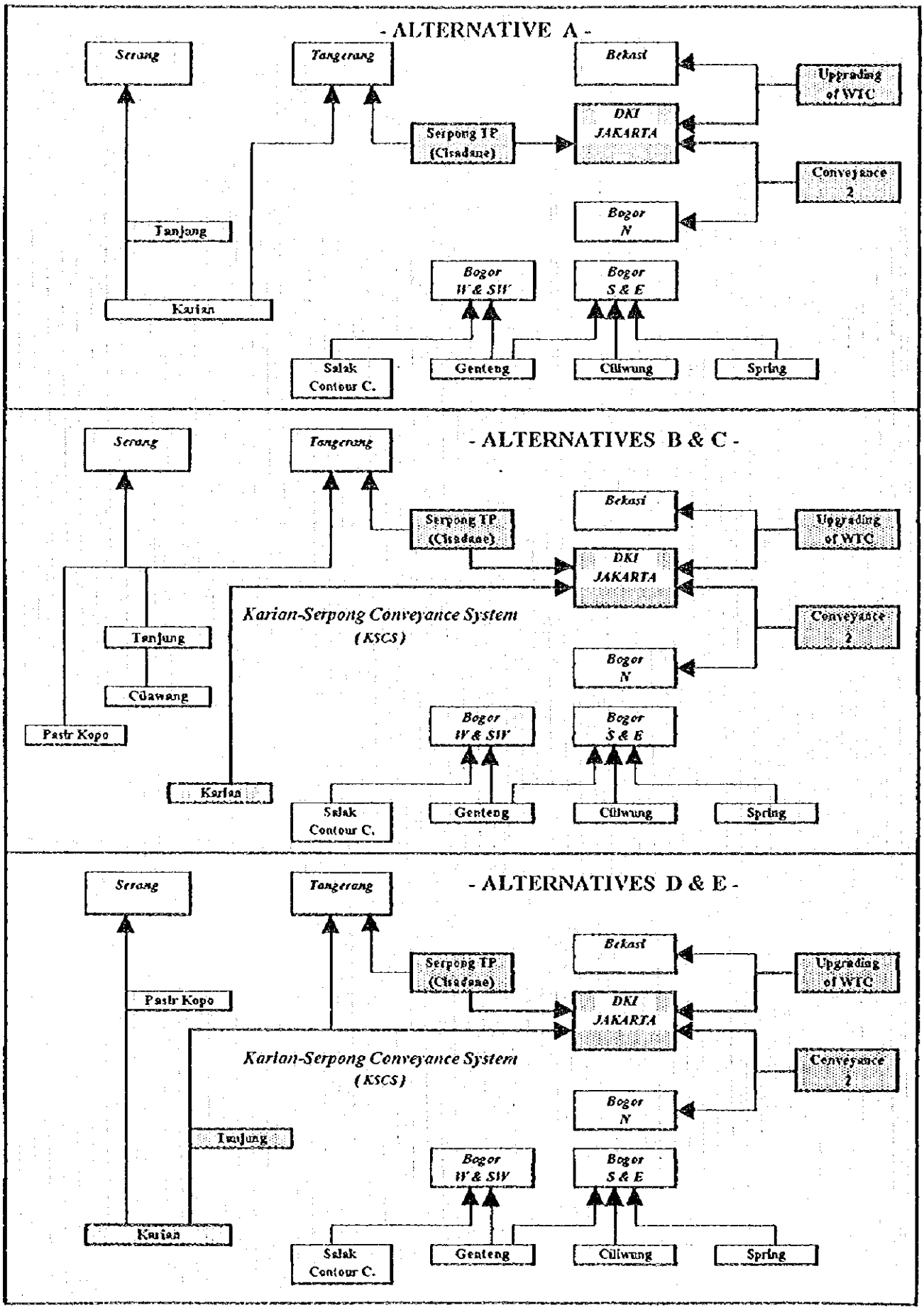
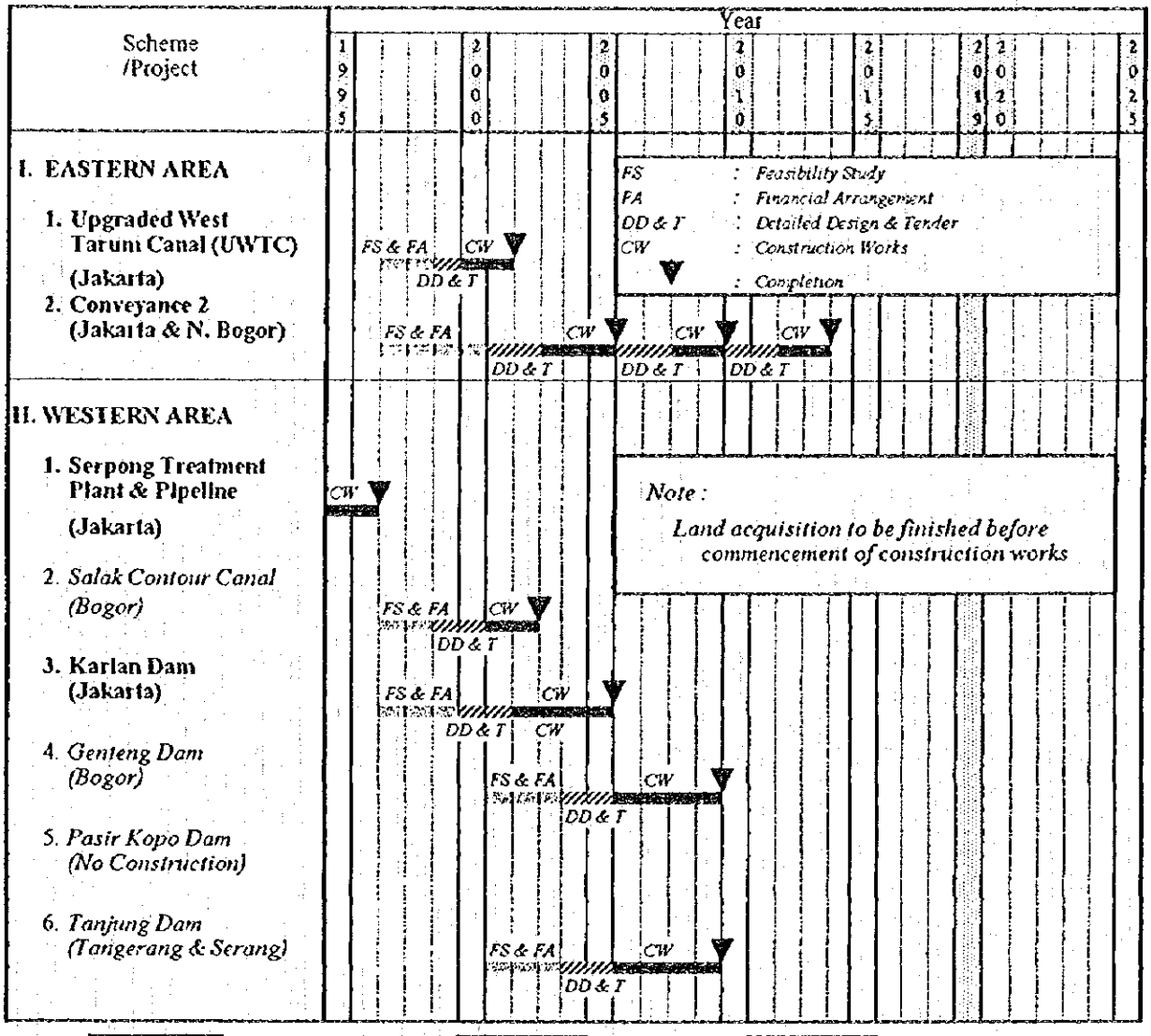
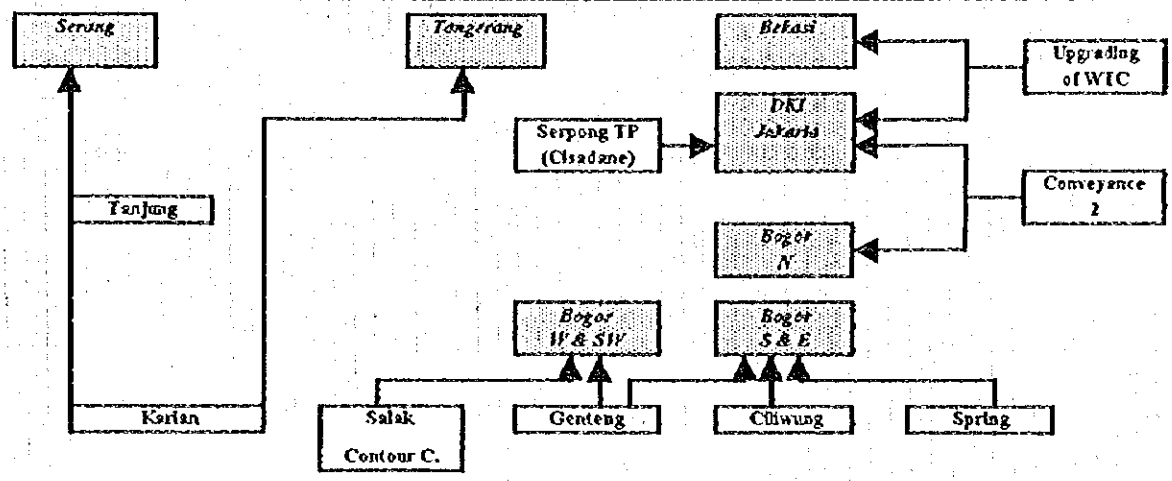


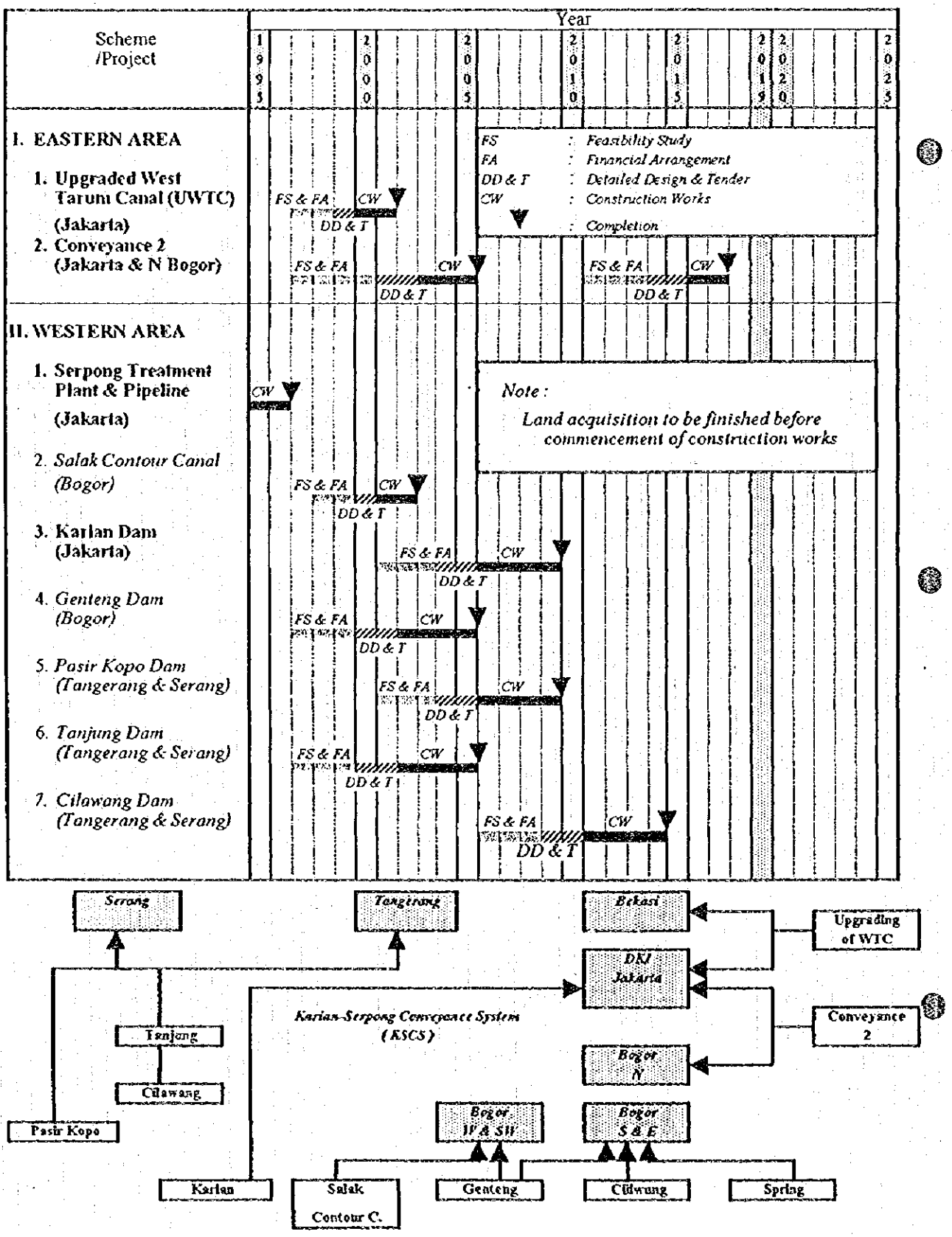
FIG. 4.3 IMPLEMENTATION SCHEDULE
OF WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES
FOR INTEGRATED JABOTABEK WATER SUPPLY SYSTEM
[ALTERNATIVE A]





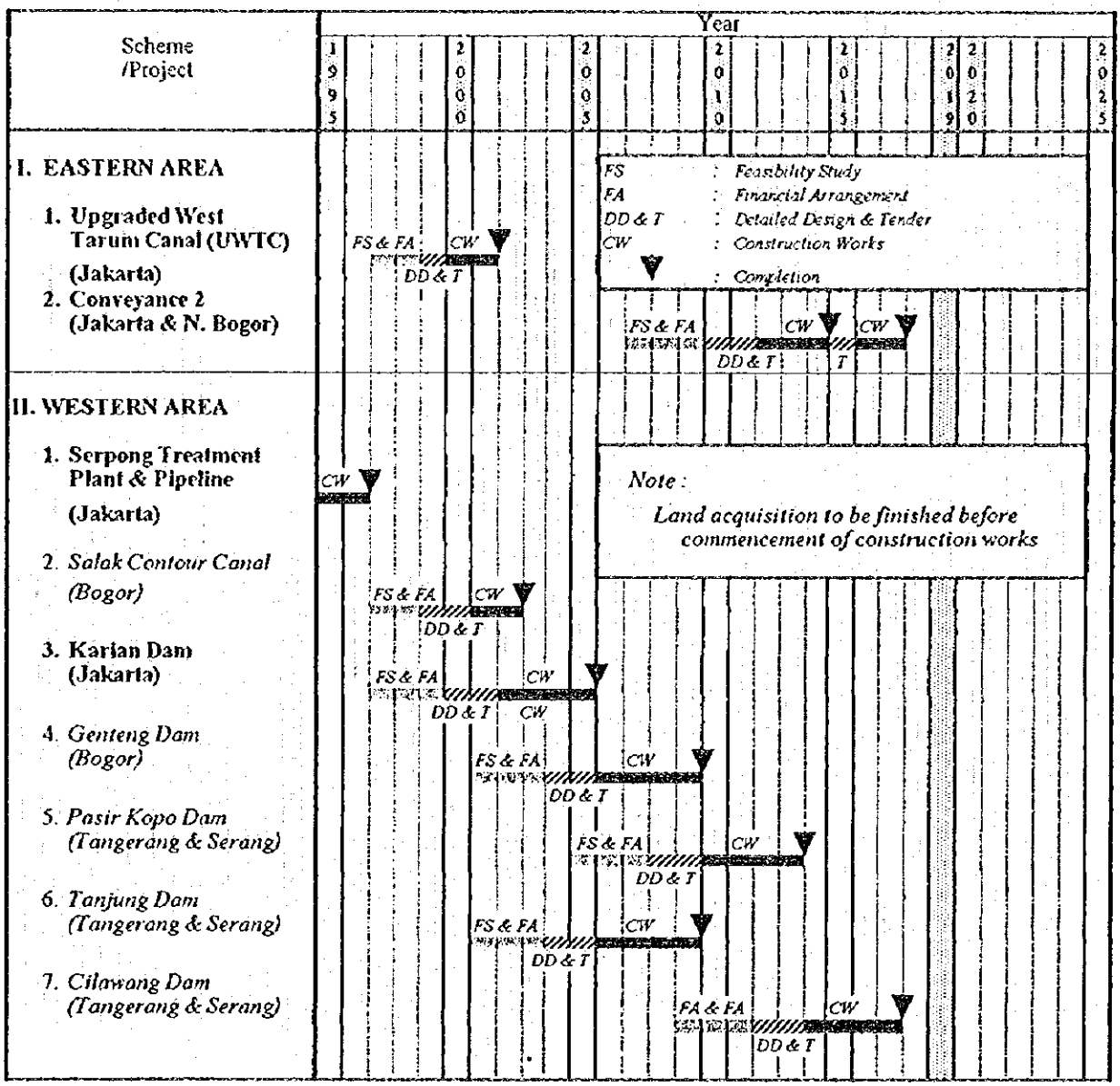
RAW WATER SOURCES AND CONVEYANCE SYSTEMS

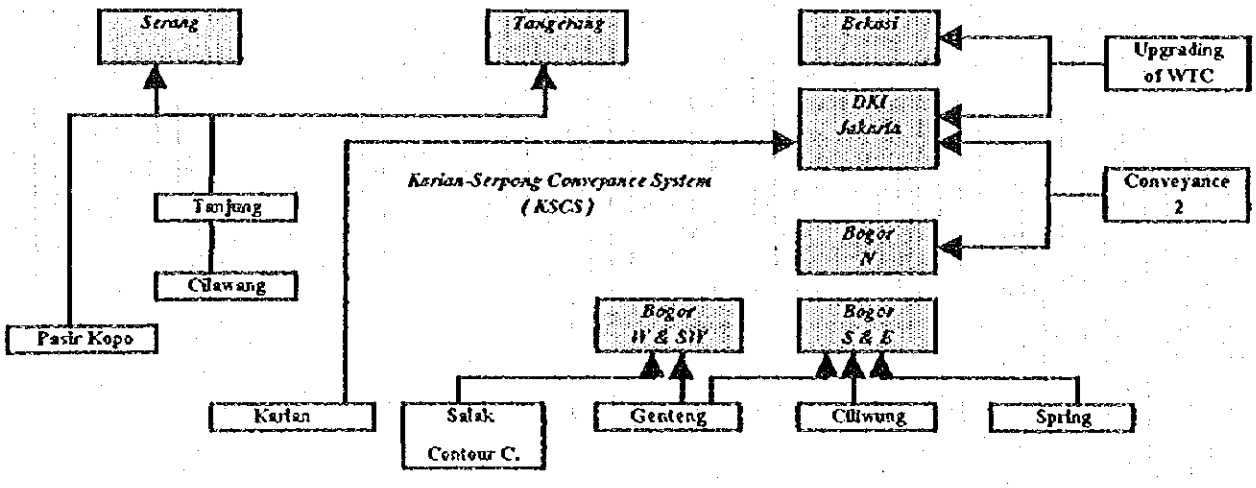
FIG. 4.4 IMPLEMENTATION SCHEDULE OF WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES FOR INTEGRATED JABOTABEK WATER SUPPLY SYSTEM [ALTERNATIVE B]



RAW WATER SOURCES AND CONVEYANCE SYSTEMS

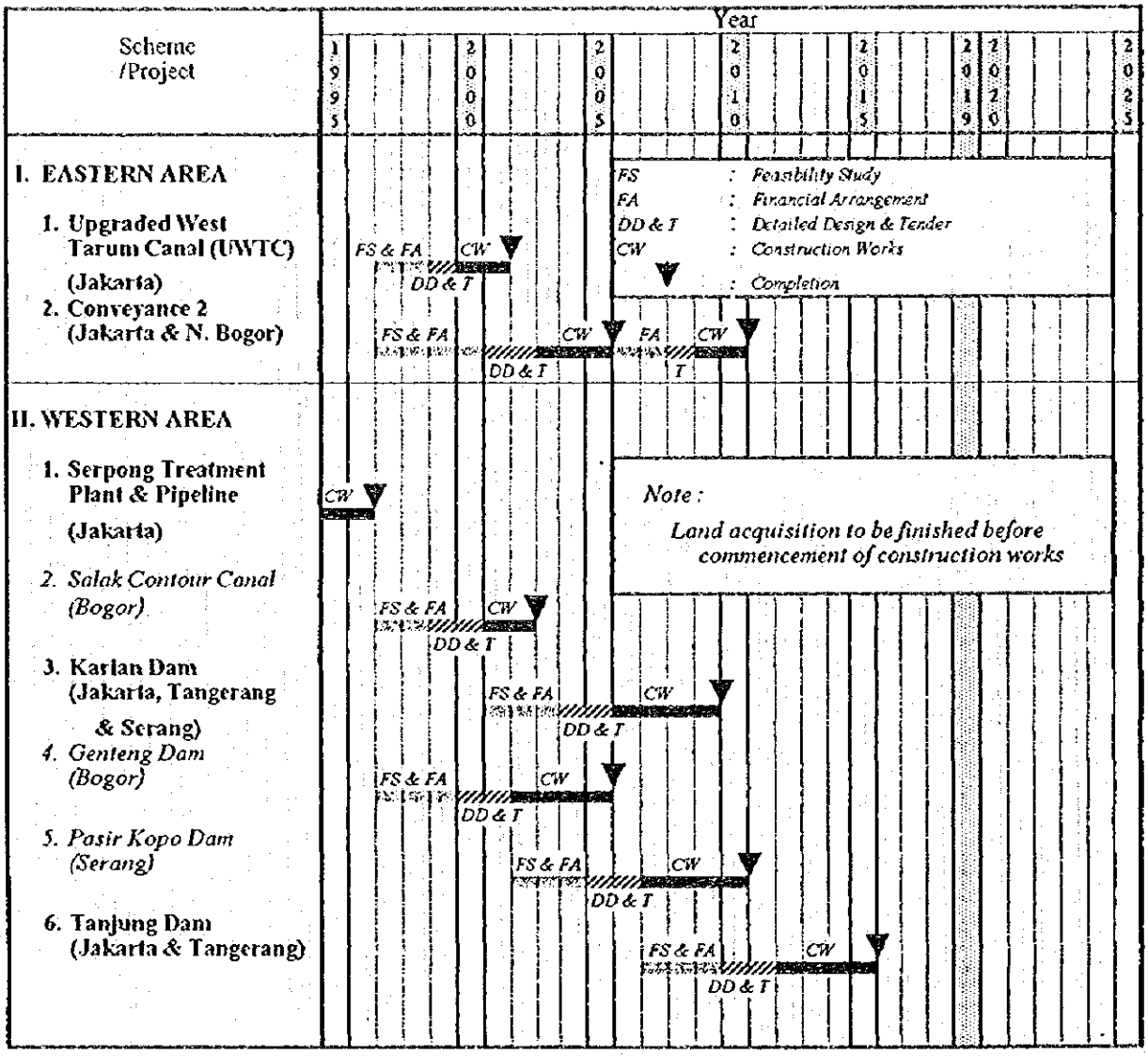
FIG. 4.5 IMPLEMENTATION SCHEDULE OF WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES FOR INTEGRATED JABOTABEK WATER SUPPLY SYSTEM [ALTERNATIVE C]

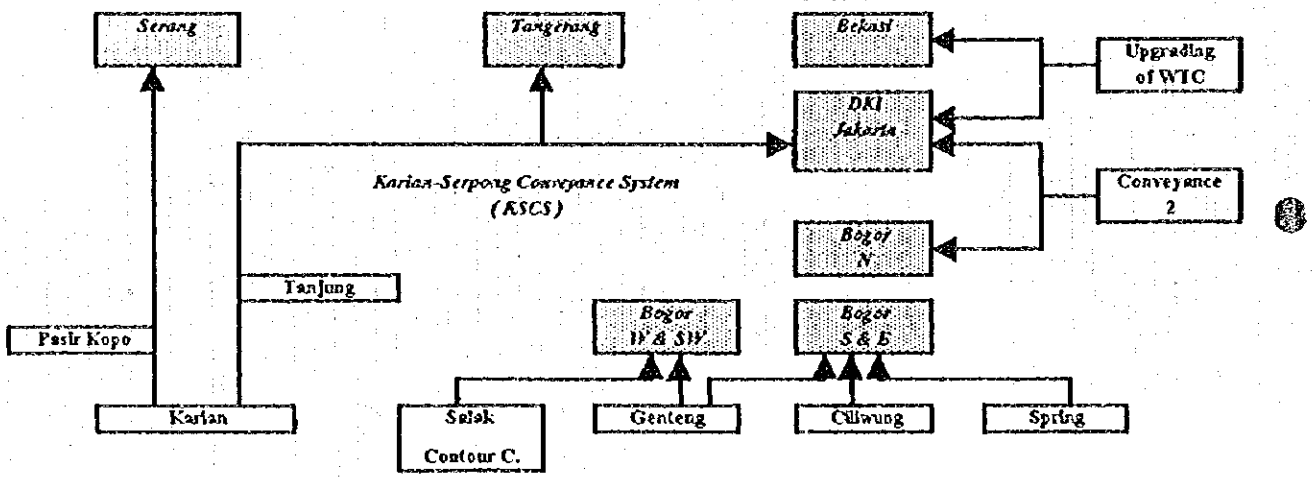




RAW WATER SOURCES AND CONVEYANCE SYSTEMS

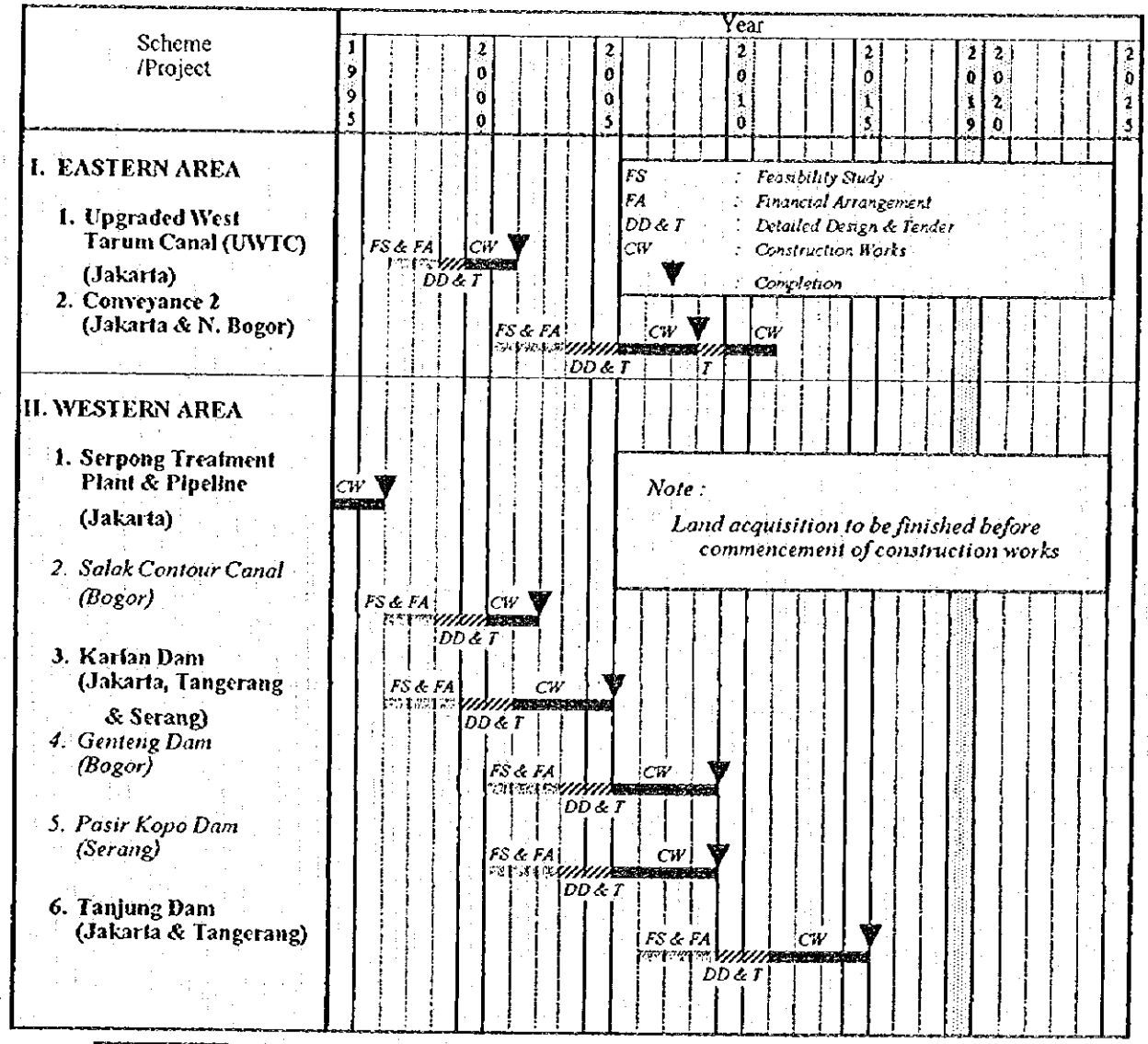
FIG. 4.6 IMPLEMENTATION SCHEDULE
OF WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES
FOR INTEGRATED JABOTABEK WATER SUPPLY SYSTEM
(ALTERNATIVE D)

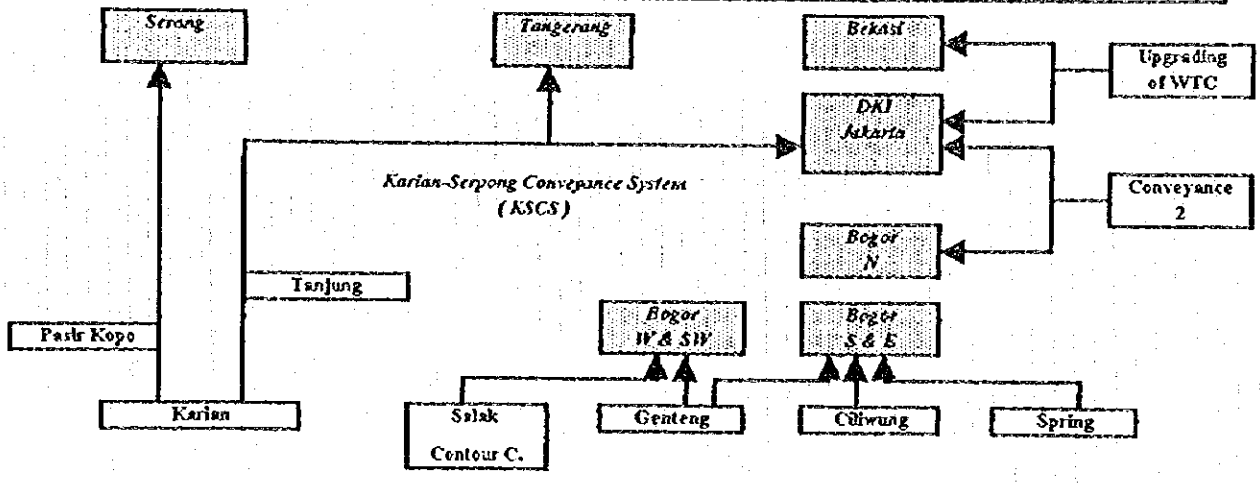




RAW WATER SOURCES AND CONVEYANCE SYSTEMS

FIG. 4.7 IMPLEMENTATION SCHEDULE
OF WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES
FOR INTEGRATED JABOTABEK WATER SUPPLY SYSTEM
[ALTERNATIVE E]





RAW WATER SOURCES AND CONVEYANCE SYSTEMS

FIG. 4.8 RAW WATER SUPPLY PATTERN TO JABOTABEK AREA IN 2019
- ALTERNATIVE A -

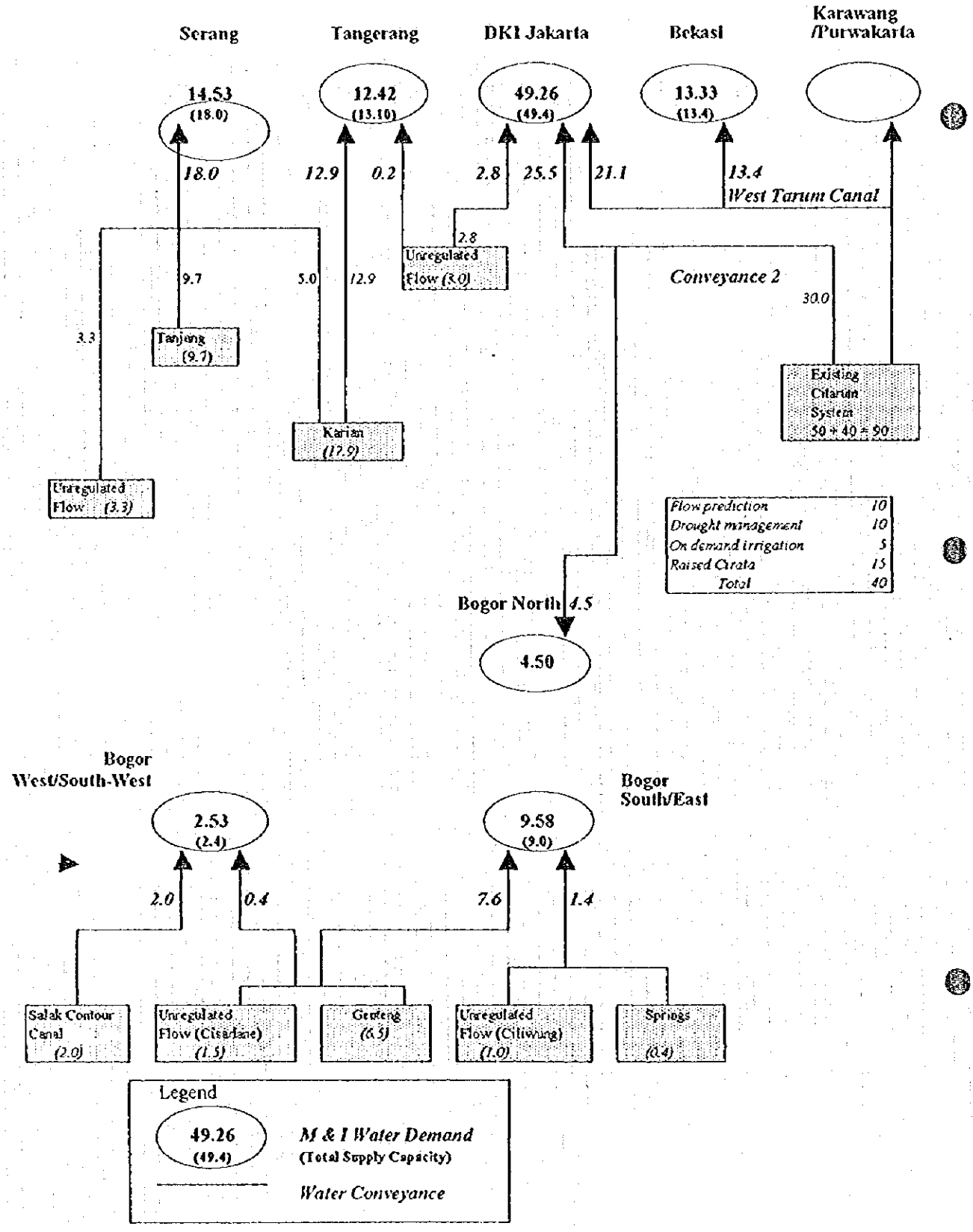
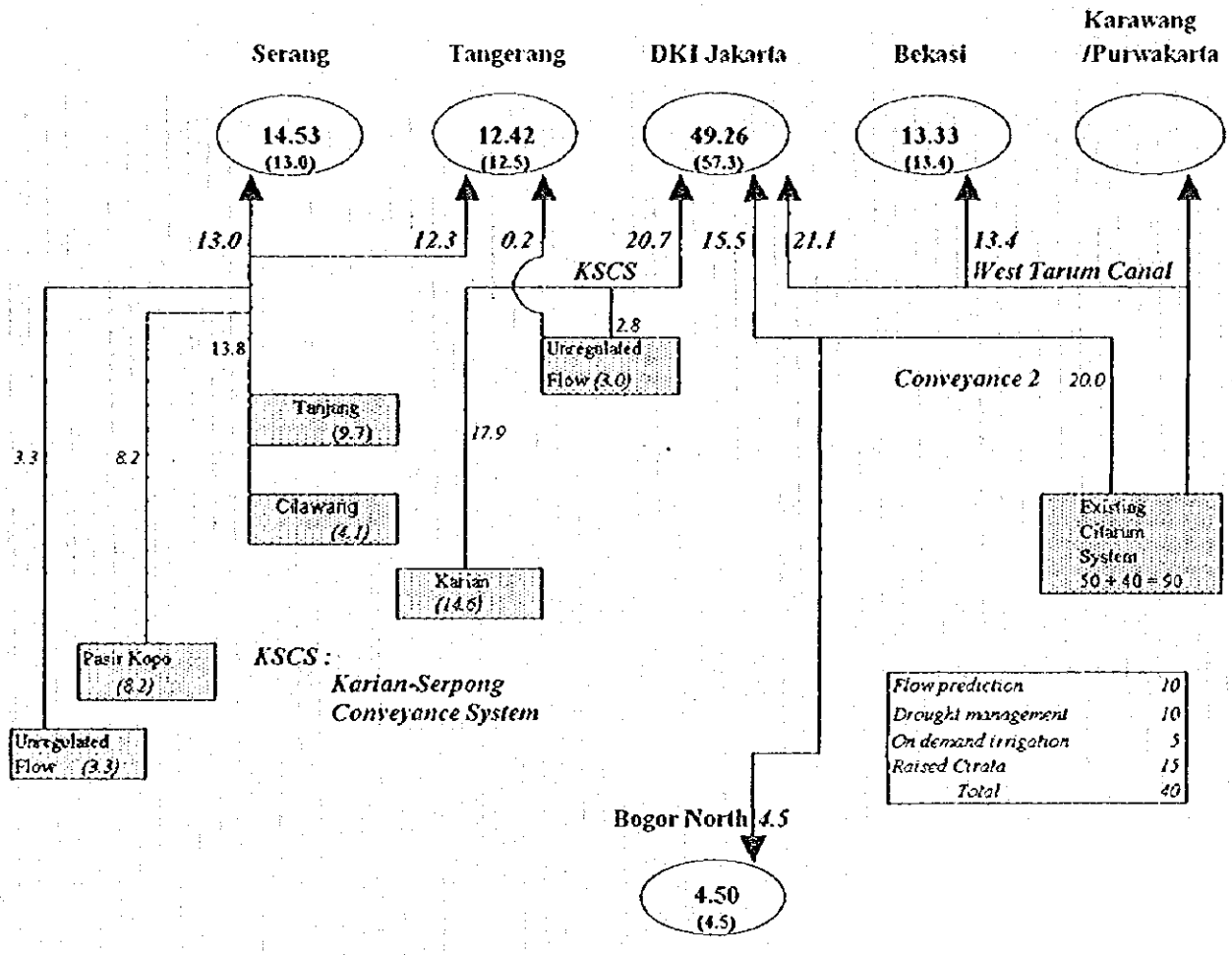
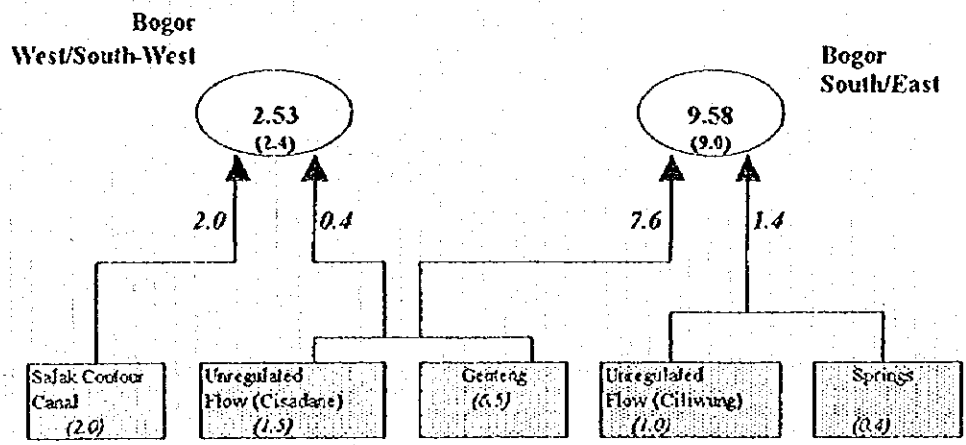


FIG. 4.9 RAW WATER SUPPLY PATTERN TO JABOTABEK AREA IN 2019
- ALTERNATIVES B & C -





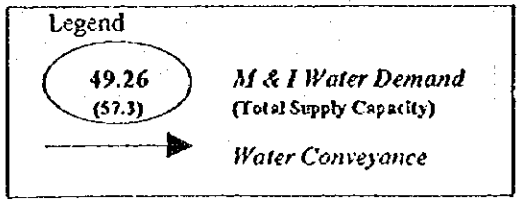


FIG. 4.10 RAW WATER SUPPLY PATTERN TO JABOTABEK AREA IN 2019
- ALTERNATIVES D & E -

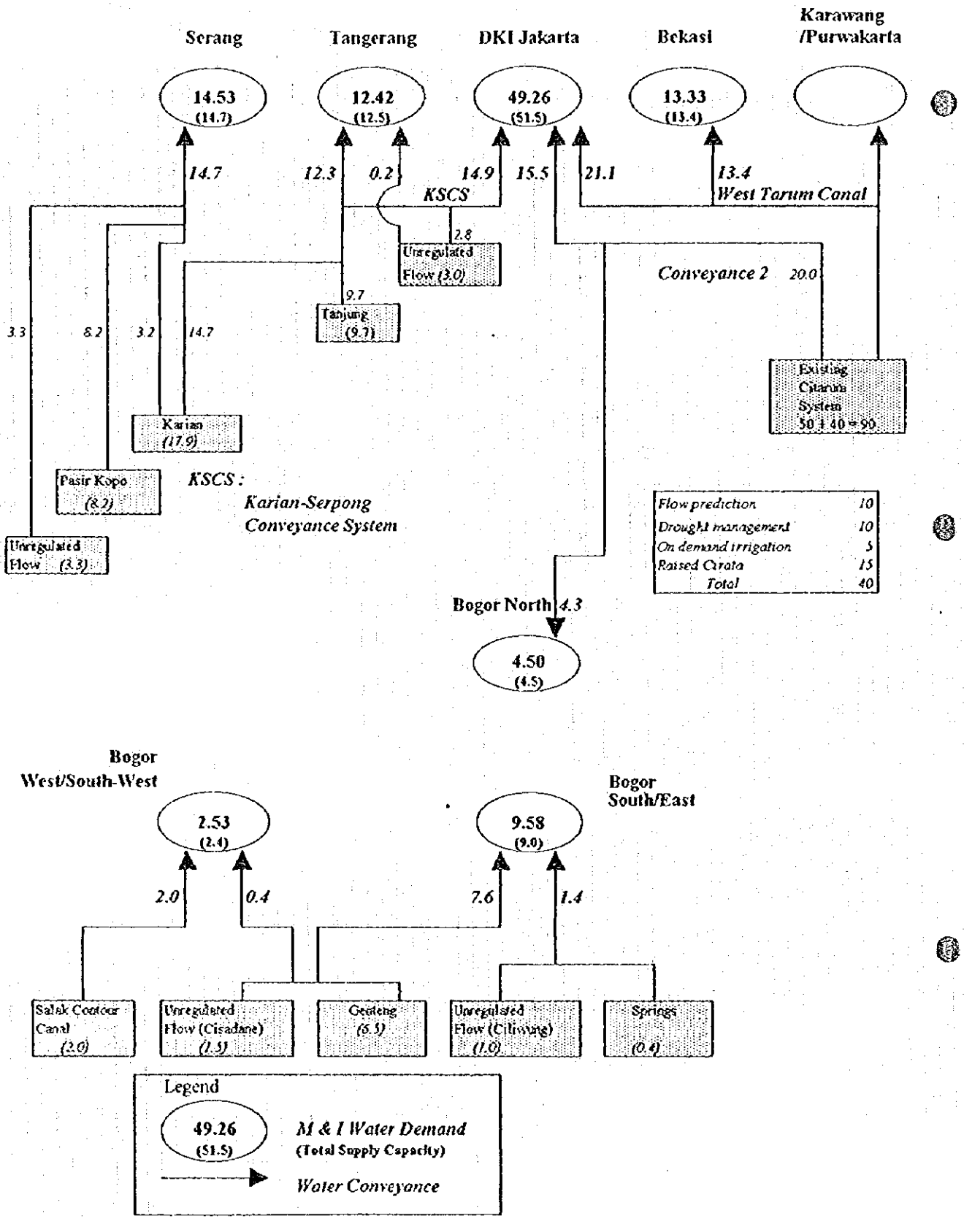


FIG. 4.11 WATER DEMAND - SUPPLY BALANCE

[ALTERNATIVE A]

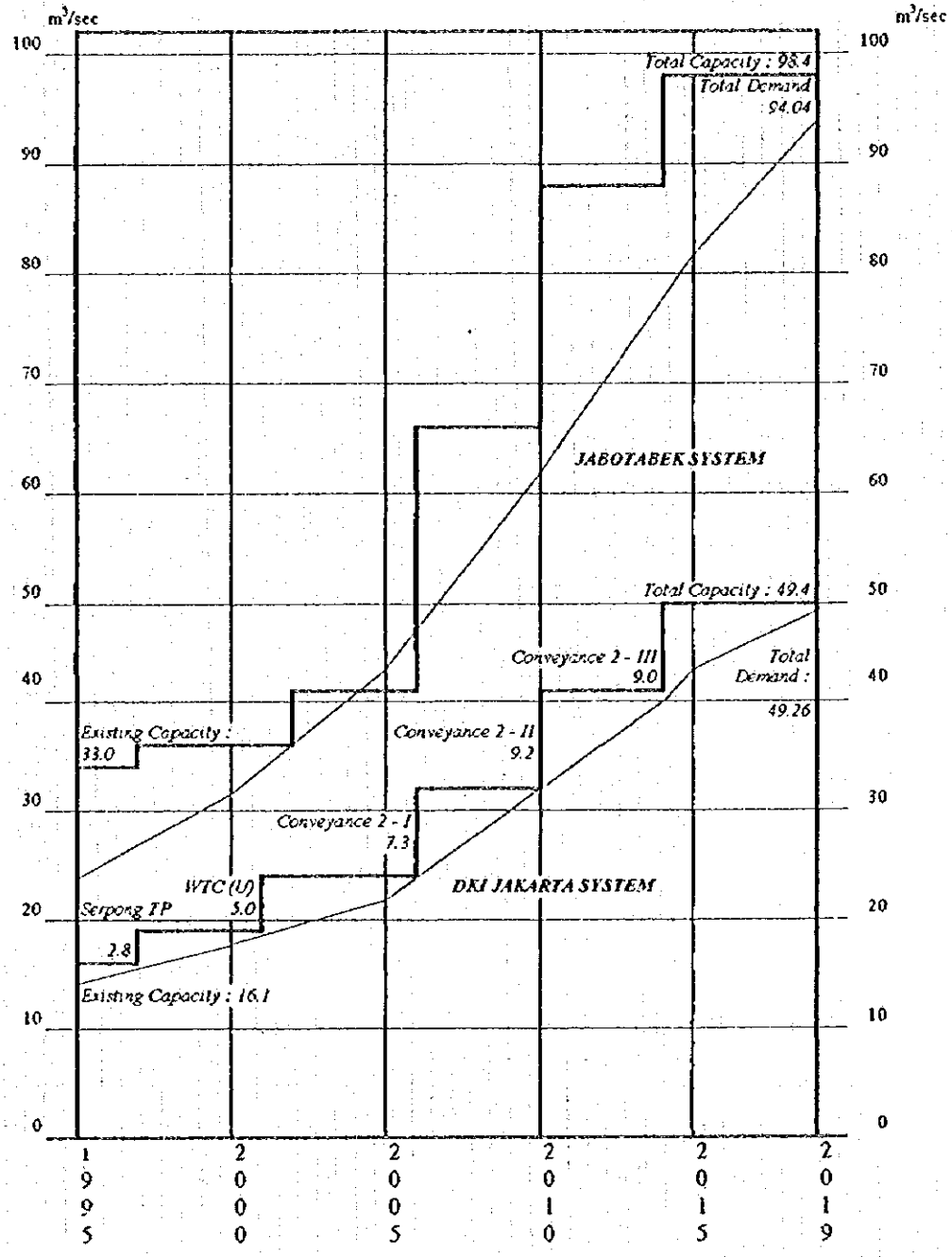


FIG. 4.12 WATER DEMAND - SUPPLY BALANCE

[ALTERNATIVE B]

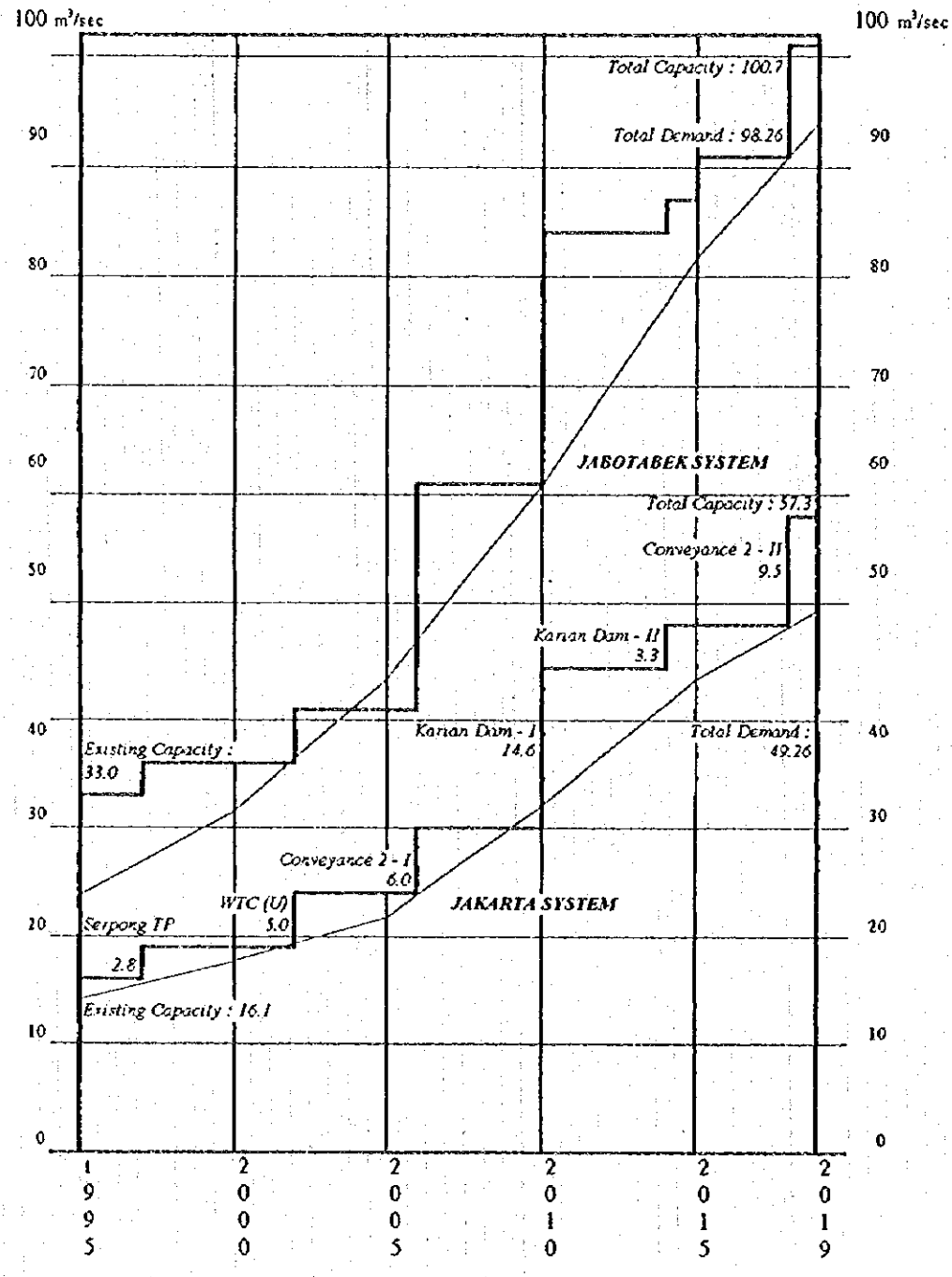


FIG. 4.13 WATER DEMAND - SUPPLY BALANCE

[ALTERNATIVE C]

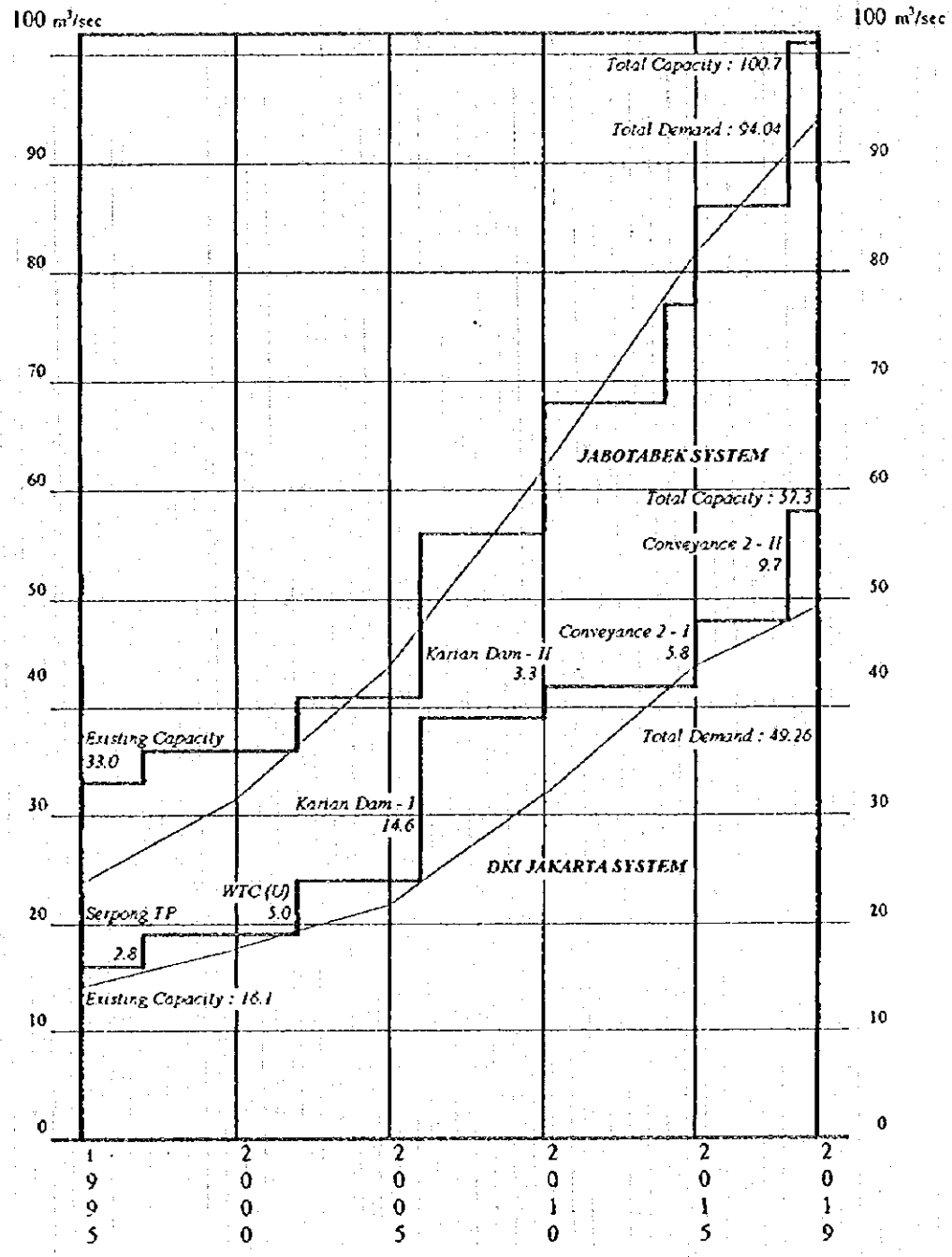


FIG. 4.14 WATER DEMAND - SUPPLY BALANCE

[ALTERNATIVE D]

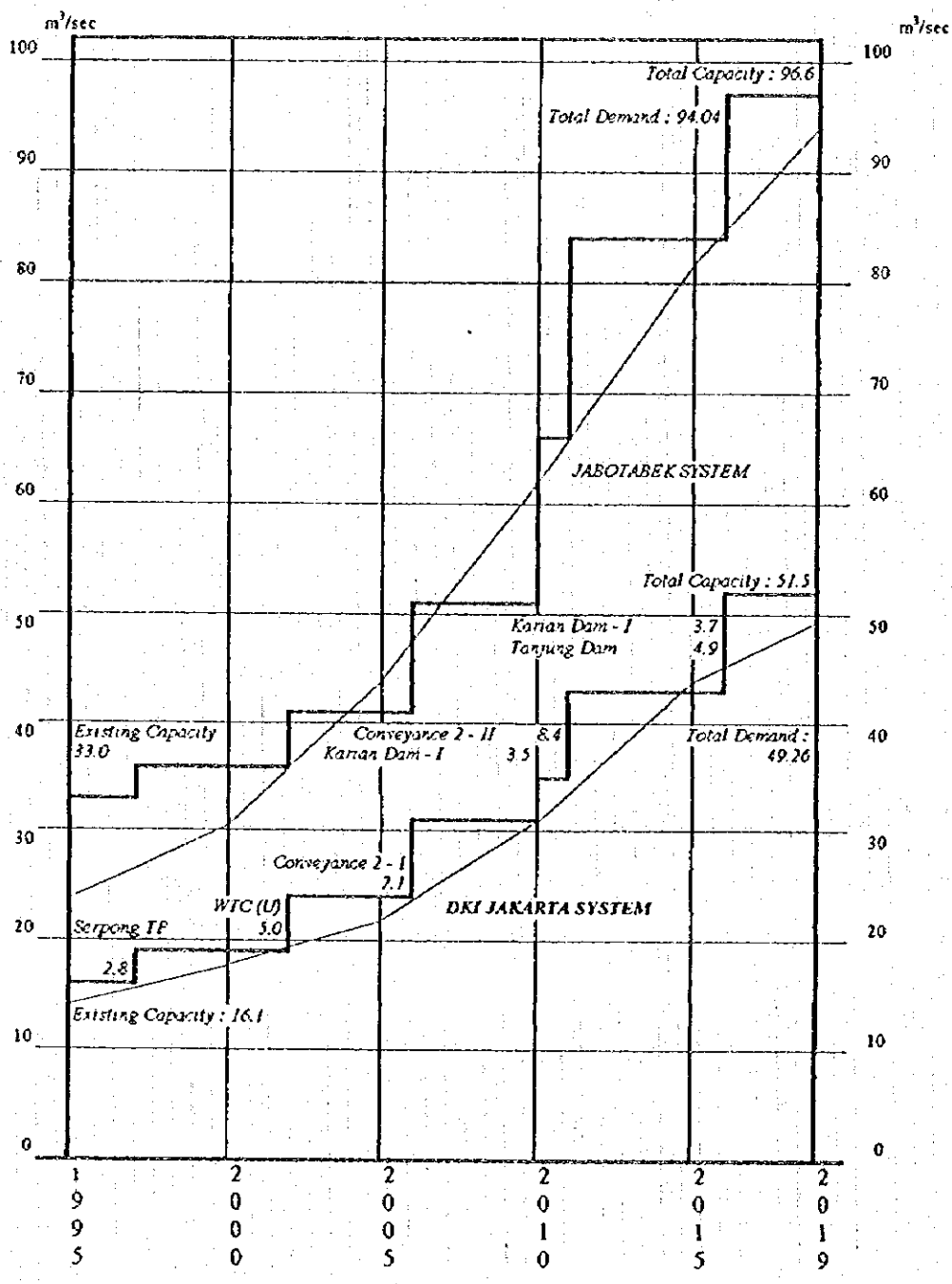


FIG. 4.15 WATER DEMAND - SUPPLY BALANCE

[ALTERNATIVE E]

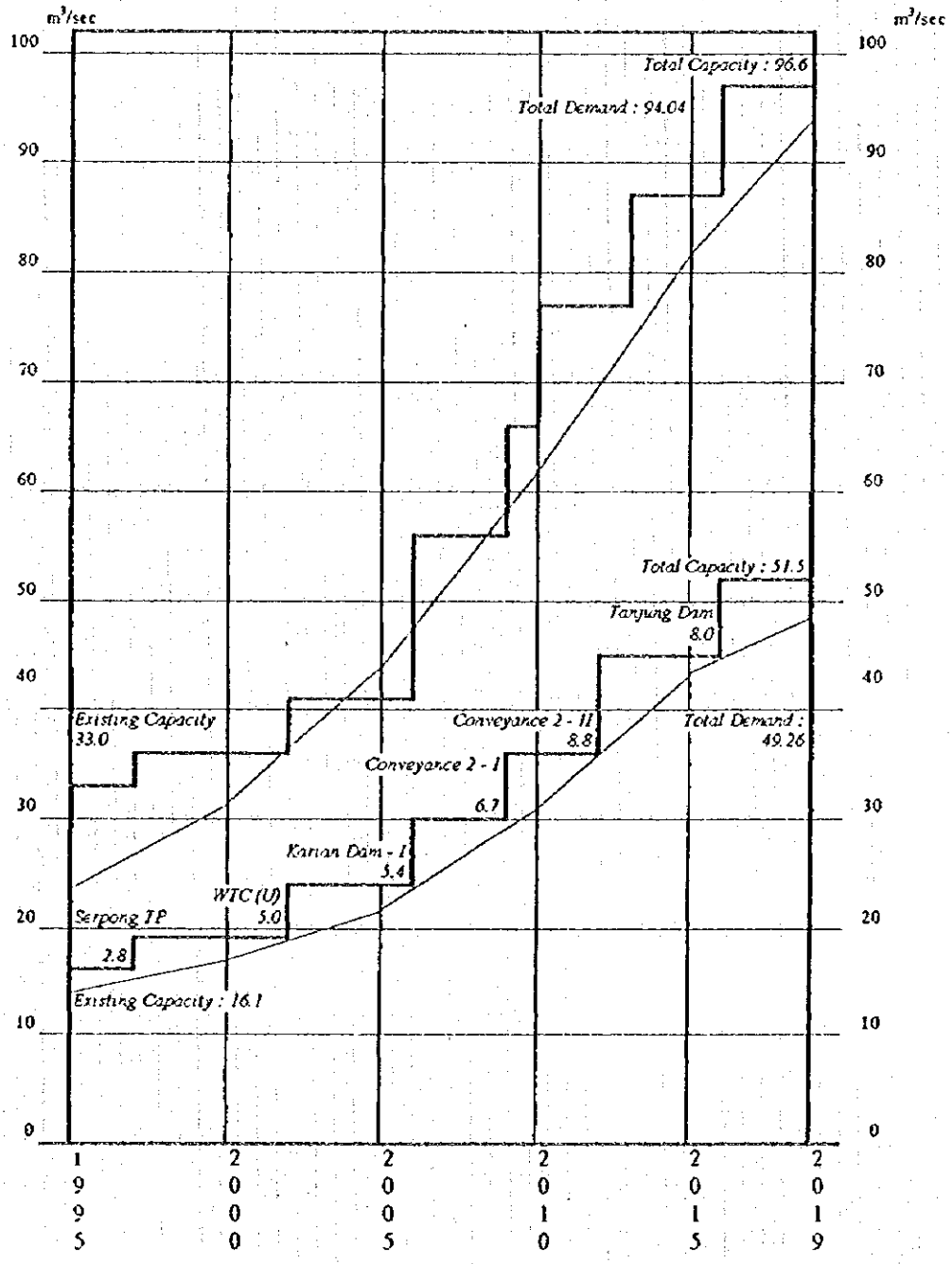


FIG. 4.16 PROPOSED PHASING DEVELOPMENT PLAN OF KSCS SCENARIO I

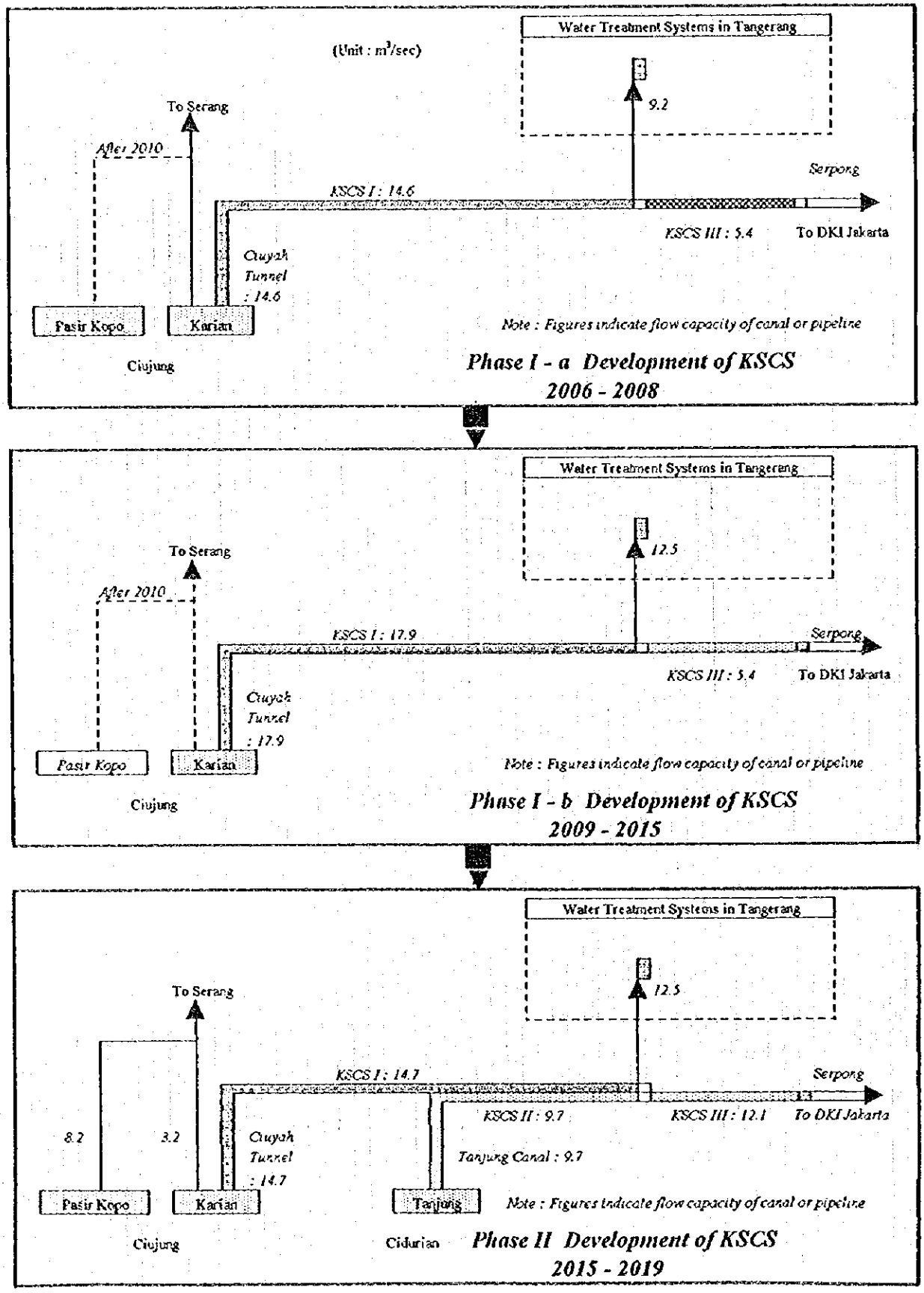


FIG. 4.17 WATER DEMAND - SUPPLY BALANCE FOR SCENARIO I

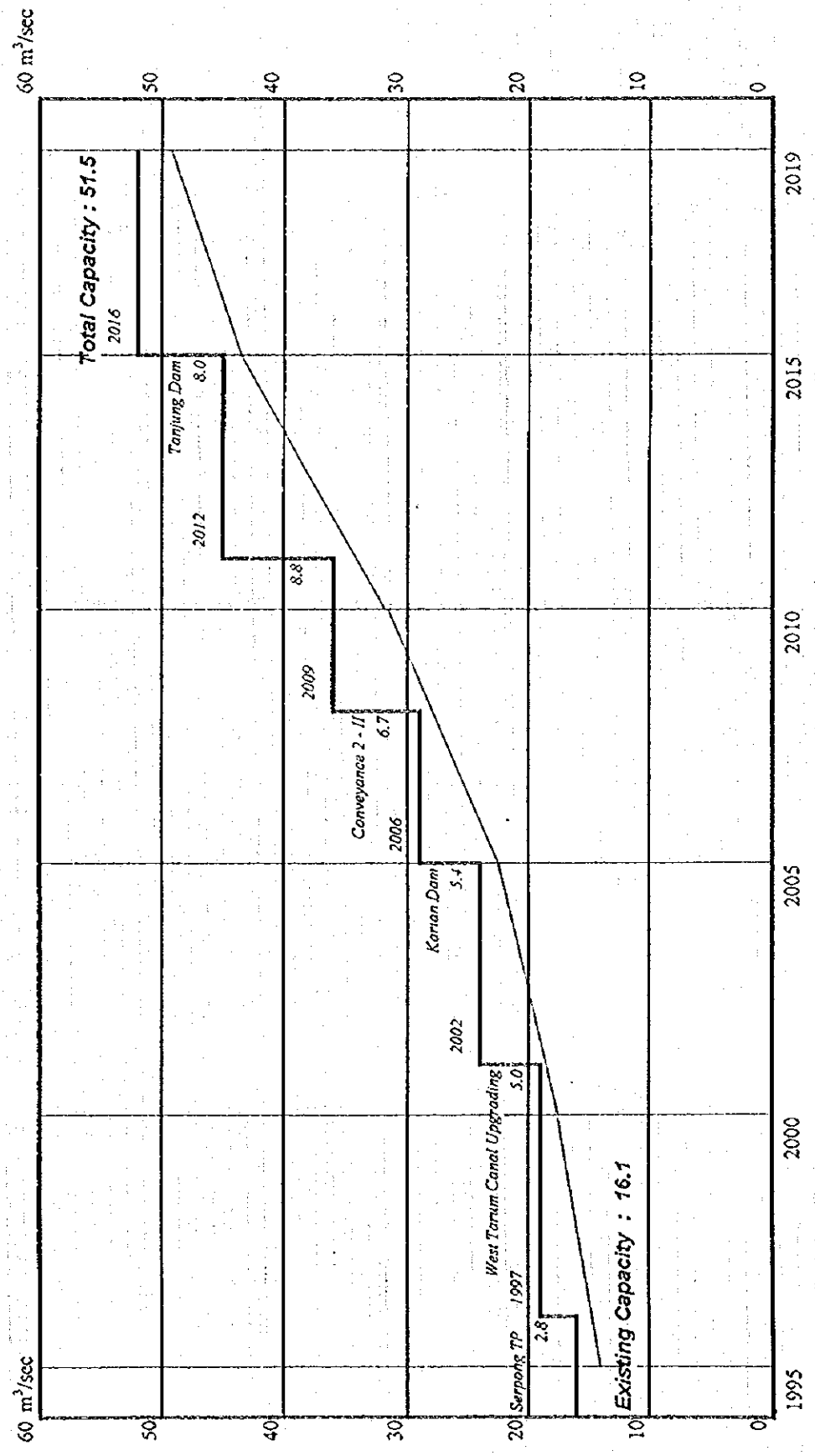


FIG. 4.18 RAW WATER SUPPLY PATTERN TO JABOTABEK AREA IN 2019
FOR SCENARIO I

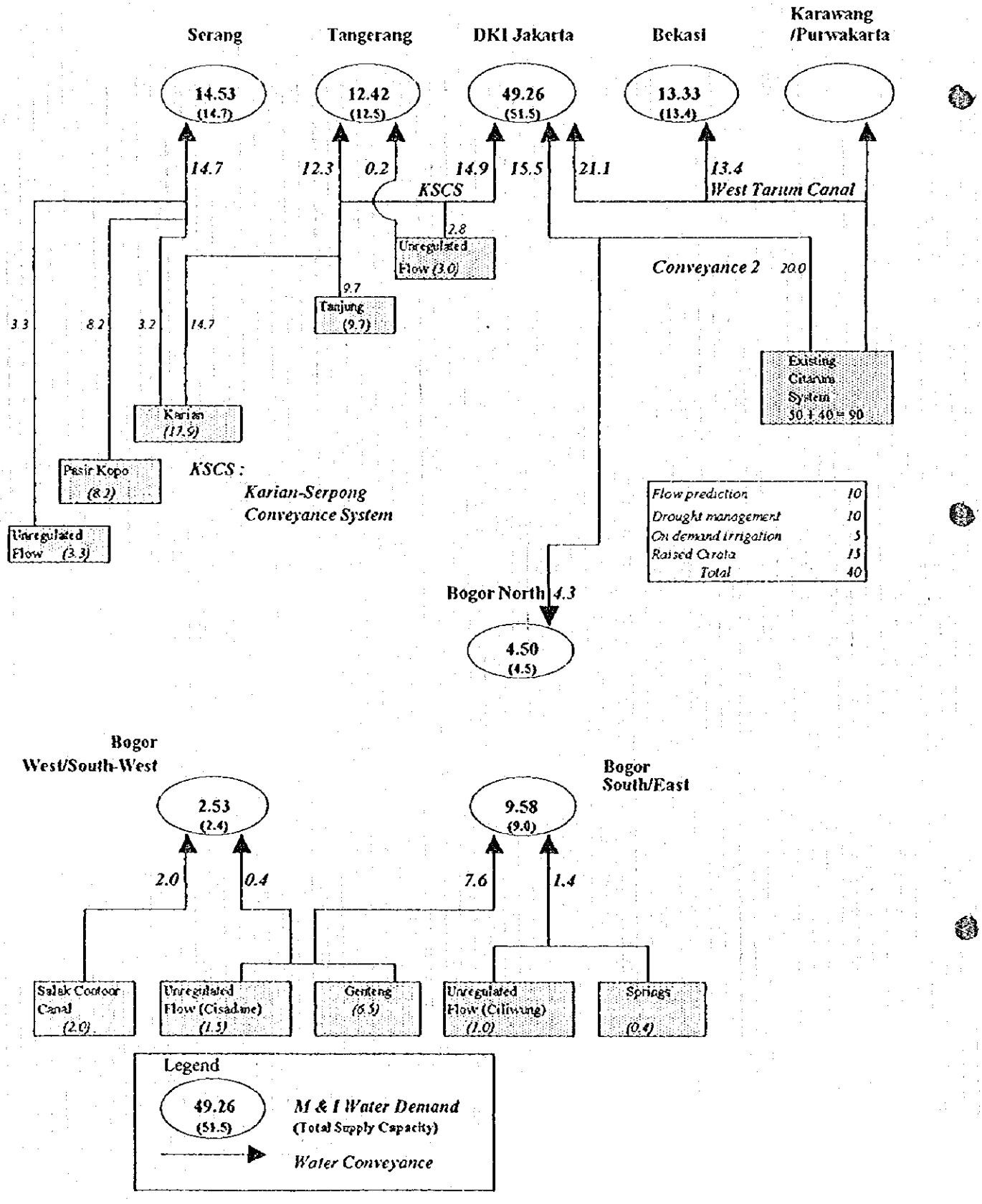


FIG. 4.19 WATER DEMAND - SUPPLY BALANCE FOR SCENARIO II

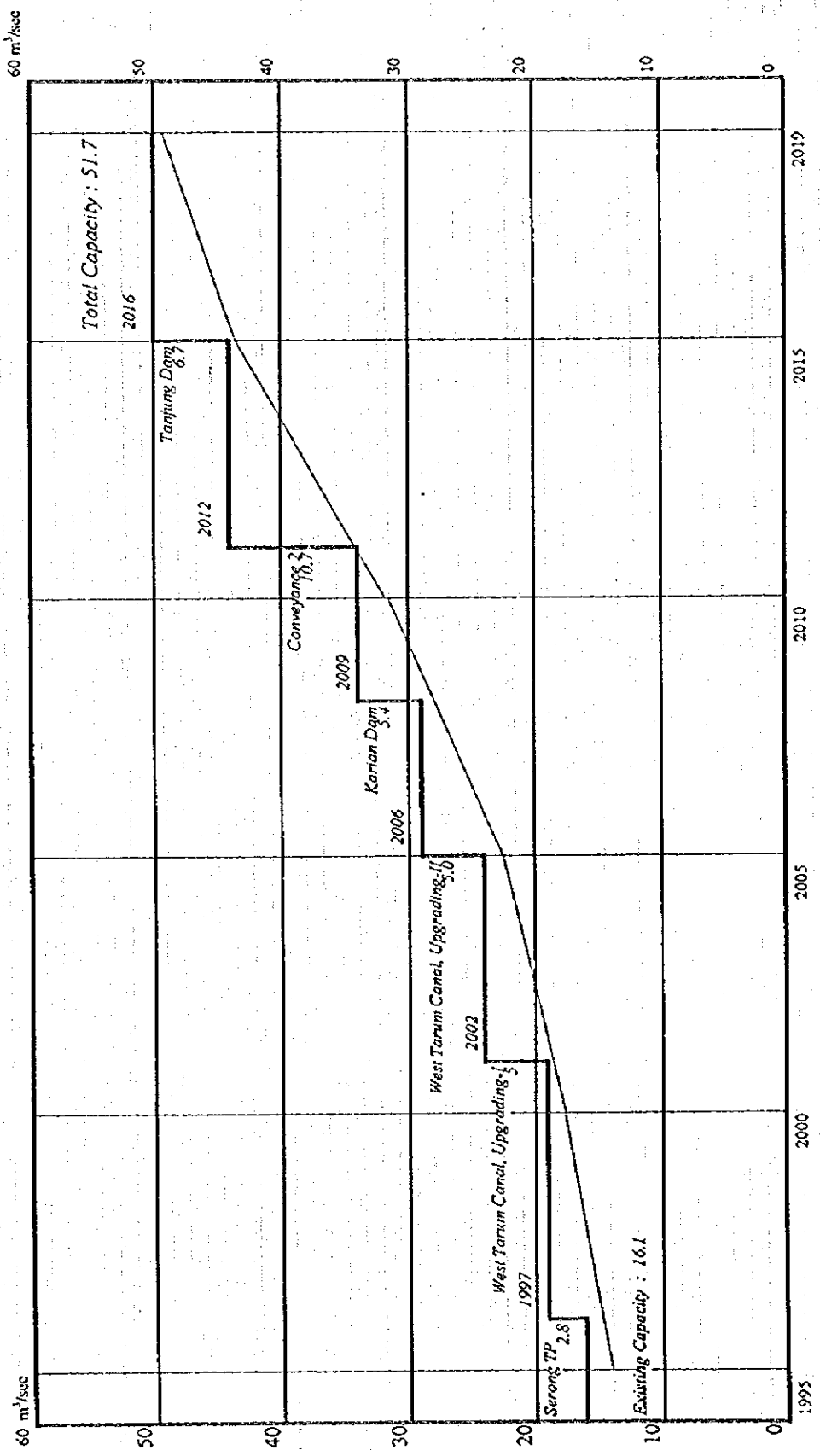


FIG. 4.20 RAW WATER SUPPLY PATTERN TO JABOTABEK AREA IN 2019
FOR SCENARIO II

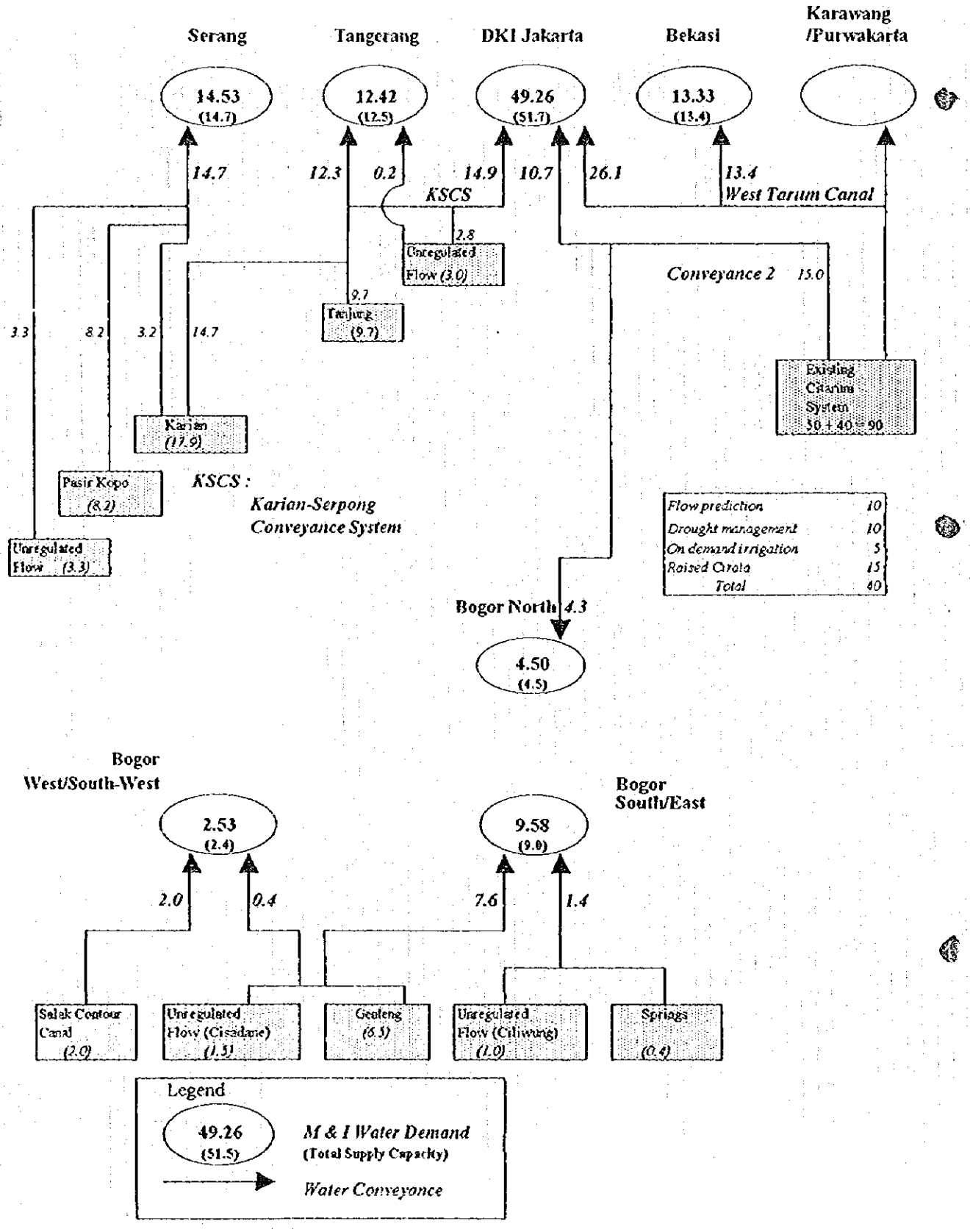


FIG. 4.21 PROPOSED PHASING DEVELOPMENT PLAN OF KSCS

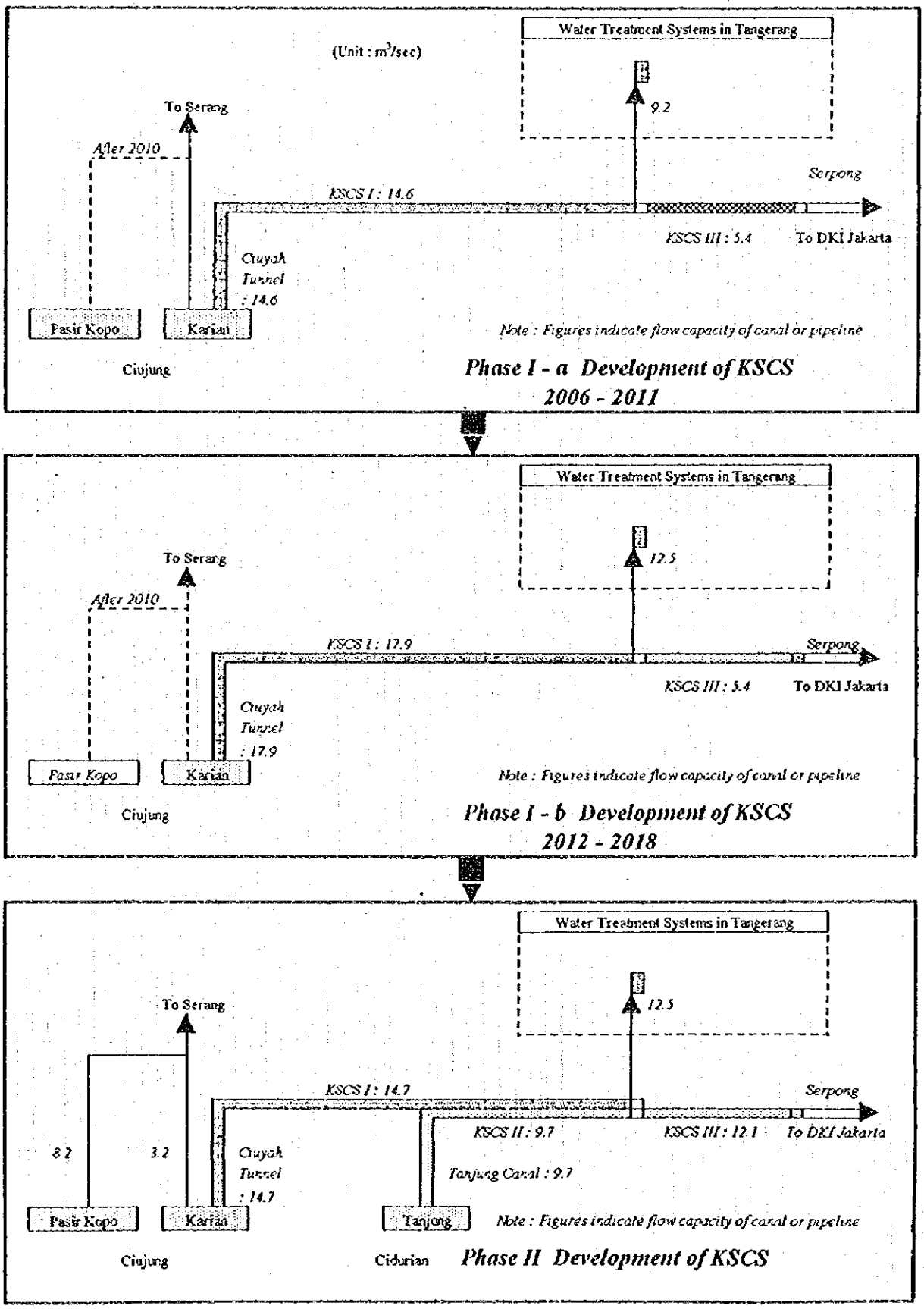


FIG. 4.22 IMPLEMENTATION SCHEDULE FOR KARIAN DAM - KSCS PROJECT

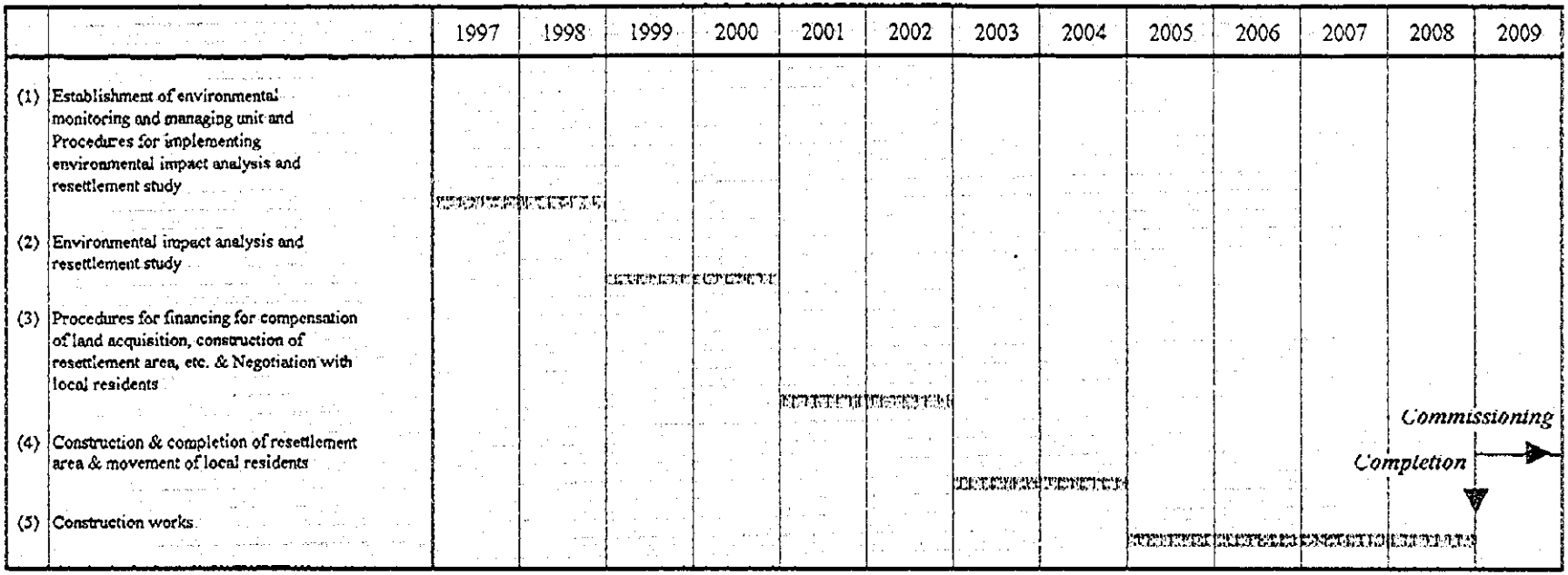
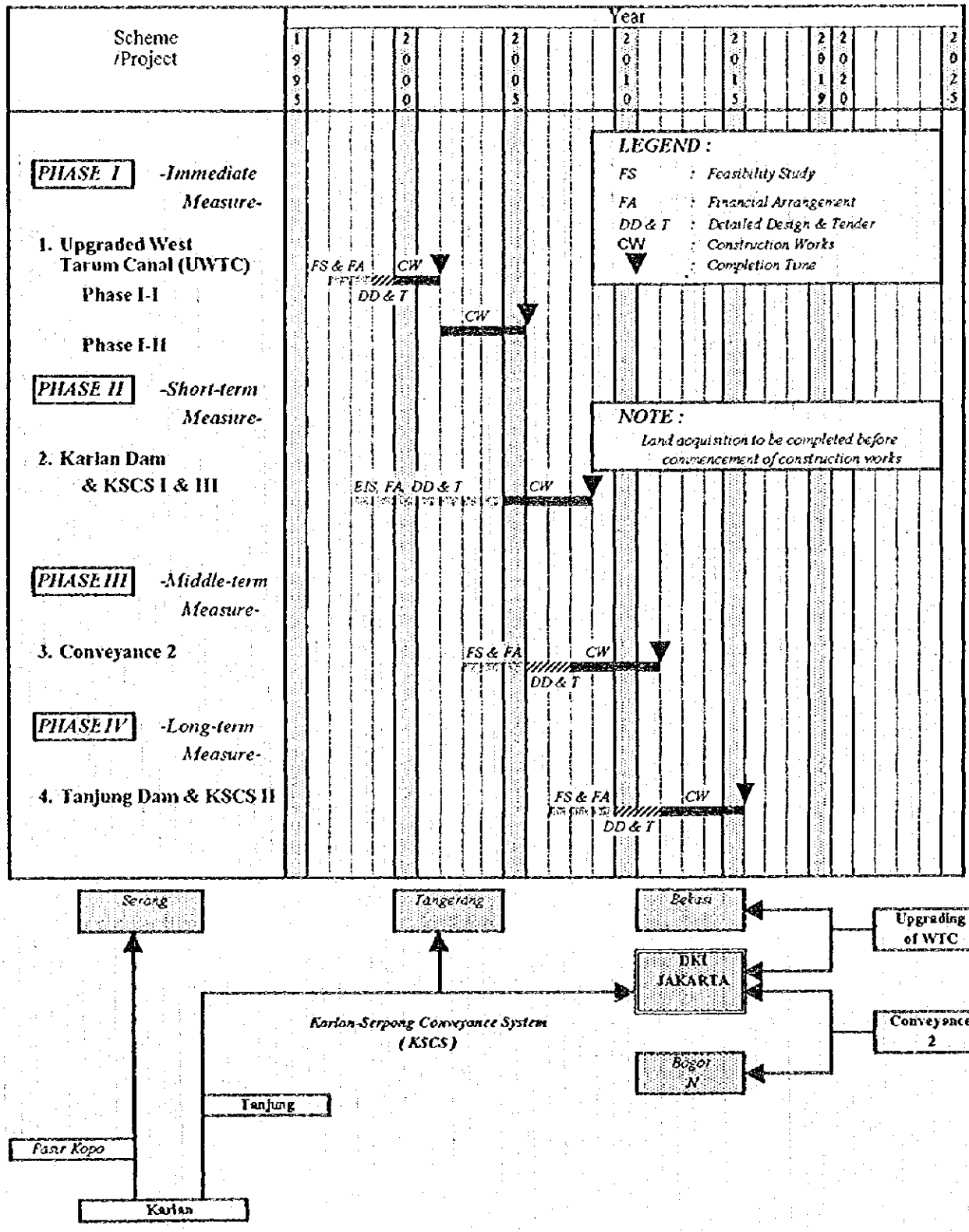
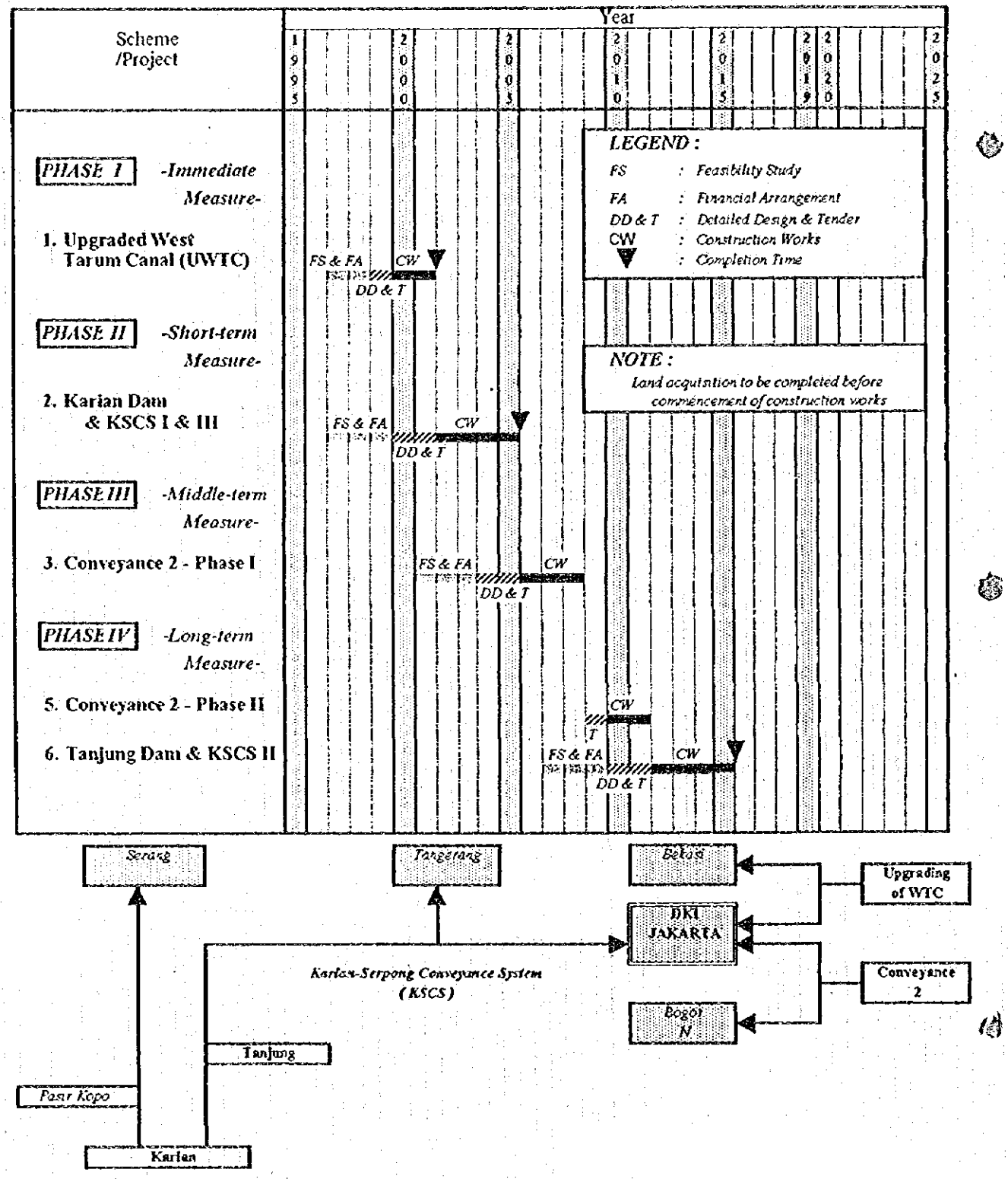


FIG. 6.1 PROPOSED ACTION PROGRAM ON WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES FOR DKI WATER SUPPLY SYSTEM



RAW WATER SOURCES AND CONVEYANCE SYSTEMS

FIG. 6.2 PROPOSED ACTION PROGRAM
ON WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES
FOR DKI WATER SUPPLY SYSTEM
UNDER ORIGINAL SCHEDULE



RAW WATER SOURCES AND CONVEYANCE SYSTEMS