extension is proposed. Annual O&M area for swamp system is some 1.3 million ha. as presented on Table 10.37.

10.8.2 Cost Estimates

Based on the above condition, development costs are estimated by type of development and by province. They are shown on Tables 10.24 to 10.36, and summarized below:

Estimated cost for irrigation development by type for each Repelita in PJPT II

Unit: Billion Rp.

Description	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
New Construction	273	3,261	3,489	2,250	450	9,722
Extension	395	46	0	0	0	441
Rehabilitation	1,221	p.m.	p.m.	p.m.	p.m.	1,221
Groundwater Development	272	271	246	170	170	1,129
O&M Surface Irrigation*	501	584	642	650	674	3,050
Swamp Development	1,040	p.m.	p.m.	p.m.	p.m.	1,040
O&M Swamp**	105	151	178	178	178	789
Handing over Small Schemes	50	76	76	30	0	232
Land Development	163	129	152	104	20	567
Village Irrigation	149	149	p.m.	p.m.	p.m.	298
Survey, Design,etc.	353	349	225	45	p.m.	972
Total	4,521	5,016	5,007	3,427	1,491	19,461

Remarks: p.m.: pre memoria; *: includes current O&M and EOM; **: includes current O&M, EOM

Necessary total costs for irrigation development in PJPT II are preliminary estimated at Rp.19.5 x 10^{12}. As for each Repelita, costs will increase from Repelita VI with Rp.4.5 x10^{12} to Repelita VII which require the highest costs at Rp.5.02x10^{12}, then will decrease afterward. Costs for Repelita X will be 1.5 x10^{12}, only less than 30% of that in Repelita VII. This uneven distribution of costs is mainly due to uneven allocation of new development projects, which are main constitutes of costs. Also rehabilitation works are not considered besides proposed projects.

How to deal with rehabilitation works in the future program is one of the main subjects to be deliberate after EOM program is finished.

Table10.1 Irrigation Developmnet Area

(Rehabilitation + Extension + On-going schemes)

Unit : 1000 ha

Code	Province	1991~ 1995	1996~ 2000	2001~ 2005	2006~ 2010	2011~ 2015	2016~ 2020
11	D.I. Aceh	65.0	40.4	8.1	0.0	0.0	0.0
12	Sumatera Utara	112.3	24.3	14.4	0.0	0.0	0.0
13	Sumatera Barat	76.5	23.8	9.0	0.0	0.0	0.0
14	Riau	2.1	0.5	0.3	0.0	0.0	0.0
15	Jambi	9.8	13.3	3.3	0.0	0.0	0.0
16	Sumatera Selatan	13.7	18.5	11.1	0.0	0.0	0.0
17	Bengkulu	16.0	7.1	3.0	0.0	0.0	0.0
18	Lampung	41.8	38.6	6.9	0.0	0.0	0.0
31	D.K.I. Jakarta	4.0	2.4	0.3	0.0	0.0	0.0
32	Jawa Barat	140.5	77.0	45.3	0.0	0.0	0.0
33	Jawa Tengah	180.2	8.0	4.8	0.0	0.0	0.0
34	D.I. Yogyakarta	24.9	4.5	2.7	0.0	0.0	0.0
35	Jawa Timur	258.2	10.5	6.3	0.0	0.0	0.0
51	Bali	14.5	13.1	3.3	0.0	0.0	0.0
52	Nusa Tenggara Barat	60.4	21.9	12.3	0.0	0.0	0.0
53	Nusa Tenggara Timur	25.1	16.1	7.8	0.0	0.0	0.0
54	Timor Timur	4.7	3.0	1.8	0.0	0.0	0.0
61	Kalimantan Barat	10.9	3.5	2.1	0.0	0.0	0.0
62	Kalimantan Tengah	2.1	2.2	1.2	0.0	0.0	0.0
63	Kalimantan Selatan	37.5	3.7	2.1	0.0	0.0	0.0
64	Kalimantan Timur	3.8	3.5	2.1	0.0	0.0	0.0
71	Sulawesi Utara	9.0	14.5	2.1	0.0	0.0	0.0
72	Sulawesi Tengah	48.3	17.1	1.8	0.0	0.0	0.0
73	Sulawesi Selatan	64.5	46.6	25.0	0.0	0.0	0.0
74	Sulawesi Tenggara	9.5	3.4	1.8	0.0	0.0	0.0
81	Maluku	3.0	2.0	1.2	0.0	0.0	0.0
82	Irian Jaya	3.3	5.8	0.0	0.0	0.0	0.0
	Indonesia	1,241.5	425.2	180.1	0.0	0.0	0.0
	Zone1	256.0	89.0	31.8	0.0	0.0	0.0
	Zone2	81.3	77.6	24.3	0.0	0.0	0.0
	Zone3	622.2	115.4	62.7	0.0	0.0	0.0
	Zone4	54.3	12.9	7.5	0.0	0.0	0.0
	Zone5	131.3	81.6	30.7	0.0	0.0	0.0
	Zone6	96.5	48.7	23.1	0.0	0.0	0.0
	Indonesia	1,241.5	425.2	180.1	0.0	0.0	0.0

Source : Team's estimate

Table 10.2 Development Area for Repelita VI

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale	Land Development
11	D.I. Aceh	0.0	39.0	6.3	0.0	13.5	15.5
12	Sumatera Utara	3.9	1.7	59.6	0.0	24.0	27.9
13	Sumatera Barat	0.0	5.0	27.1	0.0	15.0	35.7
14	Riau	0.0	0.0	0.8	0.0	0.5	10.5
15	Jambi	0.0	13.0	2.0	0.0	5.5	5.2
16	Sumatera Selatan	0.0	0.0	1.1	0.0	18.5	10.8
17	Bengkulu	0.0	0.0	12.2	0.0	5.0	8.3
18	Lampung	0.0	0.1	34.0	0.0	11.5	34.9
31	D.K.I. Jakarta	0.0	0.0	5.7	0.0	0.5	0.3
32	Jawa Barat	0.5	2.5	7.8	0.0	75.5	15.6
33	Jawa Tengah	0.0	0.3	16.9	0.0	8.0	3.1
34	D.I. Yogyakarta	0.0	0.2	5.4	0.0	4.5	2.4
35	Jawa Timur	0.0	0.0	156.9	0.0	10.5	0.6
51	Bali	0.0	0.0	16.3	0.0	5.5	6.4
52	Nusa Tenggara Barat	1.2	6.2	1.2	0.0	20.5	22.0
53	Nusa Tenggara Timur	0.4	0.0	10.3	0.0	13.0	14.8
54	Timor Timur	1.0	0.3	0.0	0.0	3.0	1.3
61	Kalimantan Barat	0.8	1.1	0.0	0.0	3.5	1.8
62	Kalimantan Tengah	0.0	0.2	0.3	0.0	2.0	1.0
63	Kalimantan Selatan	0.3	0.3	0.1	0.0	3.5	6.3
64	Kalimantan Timur	0.0	0.0	0.4	0.0	3.5	6.3
71	Sulawesi Utara	0.0	7.7	4.1	0.0	3.5	15.5
72	Sulawesi Tengah	8.0	10.8	20.1	0.0	3.0	34.1
73	Sulawesi Selatan	9.5	0.2	15.2	0.0	37.5	10.4
74	Sulawesi Tenggara	0.6	0.4	1.5	0.0	3.0	19.5
81	Maluku	0.0	0.1	0.9	0.0	2.0	0.7
82	Irian Jaya	0.0	5.0	0.8	0.0	0.0	11.5
	Indonesia	26.4	94.0	406.9	0.0	296.0	322.2
	Zone1	3.9	45.6	93.9	0.0	53.0	89.5
	Zone2	0.0	13.1	49.3	0.0	40.5	59.2
	Zone3	0.5	3.0	208.8	0.0	104.5	28.2
	Zone4	1.2	1.6	0.8	0.0	12.5	15.4
	Zone5	18.2	19.0	40.9	0.0	47.0	79.5
	Zone6	2.6	11.6	13.1	0.0	38.5	50.3
	Indonesia	26.4	94.0	406.9	0.0	296.0	322.2

Source : Team's estimate

Table 10.3 Development Area for Repelita VII

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale	Land Development
11	D.I. Aceh	0.0	4.1	0.0	0.0	13.5	0.4
12	Sumatera Utara	0.0	0.0	0.0	0.0	24.0	0.0
13	Sumatera Barat	0.0	0.0	0.0	0.0	15.0	0.0
14	Riau	0.0	0.0	0.0	0.0	0.5	0.0
15	Jambi	0.0	0.0	0.0	0.0	5.5	0.3
16	Sumatera Selatan	0.0	0.0	0.0	0.0	18.5	0.0
17	Bengkulu	0.0	0.0	0.0	0.0	5.0	0.0
18	Lampung	0.0	0.0	0.0	0.0	11.5	0.0
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.5	0.0
32	Jawa Barat	0.0	0.0	0.0	0.0	75.5	0.0
33	Jawa Tengah	0.0	0.0	0.0	0.0	8.0	0.0
34	D.I. Yogyakarta	0.0	0.0	0.0	0.0	4.5	0.0
35	Jawa Timur	0.0	0.0	0.0	0.0	10.5	0.0
51	Bali	0.0	0.0	0.0	0.0	5.5	0.0
52	Nusa Tenggara Barat	0.0	0.0	0.0	0.0	20.5	0.0
53	Nusa Tenggara Timur	0.0	0.0	0.0	0.0	13.0	0.0
54	Timor Timur	0.0	0.0	0.0	0.0	3.0	0.0
61	Kalimantan Barat	0.0	0.0	0.0	0.0	3.5	0.0
62	Kalimantan Tengah	0.0	0.0	0.0	0.0	2.0	0.0
63	Kalimantan Selatan	0.0	0.0	0.0	0.0	3.5	0.0
64	Kalimantan Timur	0.0	0.0	0.0	0.0	3.5	0.0
71	Sulawesi Utara	0.0	0.0	0.0	0.0	3.5	0.0
72	Sulawesi Tengah	0.0	4.4	0.0	0.0	3.0	2.6
73	Sulawesi Selatan	0.0	2.5	0.0	0.0	37.5	0.0
74	Sulawesi Tenggara	0.0	0.0	0.0	0.0	3.0	0.0
81	Maluku	0.0	0.0	0.0	0.0	2.0	0.0
82	Irian Jaya	0.0	0.0	0.0	0.0	0.0	0.0
	Indonesia	0.0	11.0	0.0	0.0	296.0	3.3
	Zone1	0.0	4.1	0.0	0.0	53.0	0.4
	Zone2	0.0	0.0	0.0	0.0	40.5	0.3
	Zone3	0.0	0.0	0.0	0.0	104.5	0.0
	Zone4	0.0	0.0	0.0	0.0	12.5	0.0
	Zone5	0.0	6.9	0.0	0.0	47.0	2.6
	Zone6	0.0	0.0	0.0	0.0	38.5	0.0
	Indonesia	0.0	11.0	0.0	0.0	296.0	3.3

Source : Team's estimate

Table 10.4 Paddy Production

(present program schemes)

Code	Province	Deamnd (Unit : 1000 ton)						Supply (Unit : 1000 ton)						Balance (Unit : 1000 ton)					
		Year						Year						Year					
		1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020
11	D.I. Aceh	1,254	1,412	1,560	1,699	1,774	1,815	1,303	1,535	1,648	1,736	1,793	1,849	49	123	88	37	19	34
12	Sumatera Utara	3,279	3,532	3,735	3,912	3,941	3,954	2,983	3,399	3,561	3,687	3,703	3,712	-296	-132	-174	-225	-238	-242
13	Sumatera Barat	1,419	1,544	1,651	1,749	1,785	1,805	1,925	2,402	2,535	2,622	2,708	2,794	506	858	884	873	923	989
14	Riau	1,011	1,196	1,390	1,585	1,727	1,810	474	574	617	645	665	683	-537	-622	-773	-941	-1,062	-1,127
15	Jambi	752	880	1,011	1,142	1,230	1,280	604	737	807	847	883	912	-148	-143	-205	-295	-346	-368
16	Sumatera Selatan	1,988	2,260	2,531	2,796	2,966	3,066	1,463	1,619	1,714	1,768	1,823	1,857	-525	-641	-817	-1,028	-1,143	-1,209
17	Bengkulu	478	570	666	765	837	879	356	437	473	496	512	527	-122	-133	-194	-269	-325	-351
18	Lampung	1,897	2,133	2,368	2,603	2,758	2,854	1,531	1,892	1,995	2,022	1,989	1,948	-366	-241	-373	-581	-770	-906
31	D.K.I. Jakarta	2,018	2,192	2,338	2,477	2,533	2,568	35	31	0	0	0	0	-1,983	-2,161	-2,338	-2,477	-2,533	-2,568
32	Jawa Barat	11,589	12,806	13,864	14,823	15,179	15,358	10,770	11,159	11,082	10,911	10,415	9,774	-820	-1,647	-2,781	-3,912	-4,765	-5,584
33	Jawa Tengah	6,800	7,137	7,356	7,550	7,504	7,485	9,023	10,029	10,415	10,546	10,467	10,245	2,223	2,891	3,059	2,997	2,963	2,760
34	D.I. Yogyakarta	604	612	607	604	585	576	684	746	773	773	733	683	80	134	166	169	148	108
35	Jawa Timur	7,285	7,674	7,944	8,193	8,188	8,197	8,802	9,437	9,555	9,443	9,153	8,731	1,517	1,763	1,611	1,250	965	534
51	Bali	874	920	950	975	967	963	928	1,046	1,041	1,017	975	917	54	126	92	43	8	-46
52	Nusa Tenggara Barat	1,151	1,253	1,344	1,431	1,472	1,498	1,363	1,605	1,693	1,757	1,820	1,884	212	352	349	326	348	386
53	Nusa Tenggara Timur	715	790	859	928	969	995	348	417	450	476	499	523	-367	-373	-409	-452	-470	-473
54	Timor Timur	143	160	176	192	203	209	48	57	63	67	72	76	-95	-103	-113	-125	-131	-133
61	Kalimantan Barat	1,005	1,130	1,250	1,367	1,437	1,478	724	767	806	848	885	926	-281	-362	-444	-519	-552	-552
62	Kalimantan Tengah	499	580	662	742	793	822	312	331	352	375	399	421	-186	-249	-310	-367	-394	-401
63	Kalimantan Selatar	782	872	956	1,035	1,076	1,100	1,035	1,120	1,180	1,238	1,293	1,331	254	248	224	203	216	232
64	Kalimantan Timur	648	793	948	1,110	1,234	1,307	231	266	284	300	314	329	-417	-527	-664	-809	-920	-978
71	Sulawesi Utara	702	761	810	857	876	888	417	543	632	664	686	708	-285	-218	-178	-192	-189	-180
72	Sulawesi Tengah	542	622	699	774	822	850	515	790	917	989	1,044	1,099	-27	169	218	215	222	249
73	Sulawesi Selatan	2,279	2,486	2,669	2,843	2,924	2,973	3,487	3,855	4,116	4,265	4,298	4,302	1,208	1,369	1,447	1,422	1,374	1,329
74	Sulawesi Tenggara	345	406	469	535	584	613	209	332	357	384	404	424	-136	-74	-113	-151	-180	-189
81	Maluku	346	396	445	496	535	559	19	23	26	27	28	29	-327	-373	-420	-470	-507	-530
82	Irian Jaya	317	374	435	499	550	581	36	84	104	113	122	130	-281	-291	-331	-386	-428	-451
	Indonesia	50,723	55,488	59,694	63,682	65,450	66,485	49,626	55,233	57,197	58,016	57,684	56,816	-1,097	-255	-2,497	-5,665	-7,766	-9,668
	Zone1	6,963	7,684	8,336	8,946	9,227	9,385	6,685	7,911	8,362	8,690	8,869	9,038	-278	227	26	-256	-357	-347
	Zone2	5,114	5,842	6,576	7,306	7,791	8,079	3,954	4,685	4,988	5,133	5,207	5,245	-1,160	-1,158	-1,588	-2,173	-2,584	-2,834
	Zone3	29,170	31,341	33,059	34,621	34,957	35,147	30,241	32,447	32,867	32,690	31,743	30,351	1,071	1,106	-192	-1,931	-3,214	-4,796
	Zone4	2,934	3,374	3,817	4,254	4,541	4,708	2,303	2,484	2,622	2,761	2,892	3,008	-631	-890	-1,194	-1,492	-1,649	-1,699
	Zone5	3,869	4,274	4,647	5,009	5,205	5,324	4,629	5,520	6,021	6,303	6,432	6,533	760	1,246	1,375	1,294	1,227	1,209
	Zone6	2,672	2,973	3,259	3,547	3,729	3,842	1,814	2,186	2,336	2,439	2,541	2,642	-858	-786	-923	-1,108	-1,188	-1,201
	Indonesia	50,723	55,488	59,694	63,682	65,450	66,485	49,626	55,233	57,197	58,016	57,684	56,816	-1,097	-255	-2,497	-5,665	-7,766	-9,668

Source : Team's estimate

Table 10.5 Maximum Paddy Production

Province	Area (1000ha)								Yield (ton/ha)					Production (1000 ton)							
	Irrigated A	Expandable B	Irrigation Ai=A+B	Small Scale Av	Rainfed Ar	Tidal At	Other Ao	Ground water Ag	Irrigated Yi	Small Scale Yv	Rainfed Yr	Tidal/ Other Yt	GW Yg	Irrigation Ai*Yi	Small Scale Av*Yv	Rainfed Ar*Yr	Tidal At*Yt	Other Ao*Yt	Ground water Ag*Yg	Dry	Total
D.I. Aceh	243.8	178.2	422.0	8.3	12.4	2.6	1.4	0	6.2	4.83	4.2	1.5	6.2	2,616.5	40.1	51.9	3.8	2.1	0.0	14.6	2,729.0
Sumatera Utara	312.2	283.8	596.1	14.9	34.9	8.3	23.8	0	9.3	7.25	4.2	1.5	6.2	5,543.5	107.7	146.8	12.5	35.7	0.0	147.9	5,994.1
Sumatera Barat	222.9	211.5	434.4	9.2	0.0	0.4	0.3	0	11.2	9.87	4.9	1.5	6.4	4,864.7	90.5	0.0	0.6	0.4	0.0	54.3	5,010.5
Riau	35.1	863.6	898.7	0.4	0.0	46.2	0.1	0	9.92	7.73	3.36	1.5	6.2	8,915.0	3.0	0.0	69.2	0.2	0.0	112.5	9,100.0
Jambi	47.3	477.9	525.2	3.4	0.0	75.2	24.5	0	9.92	7.73	4.2	2.1	6.2	5,209.9	26.2	0.0	157.9	51.4	0.0	156.1	5,601.6
Sumatera Selatan	84.6	1,247.8	1,332.3	11.3	0.0	83.9	132.6	0	9.92	7.73	4.2	2.7	6.2	13,216.7	87.5	0.0	226.7	358.1	0.0	206.7	14,095.6
Bengkulu	60.6	100.7	161.4	3.1	0.0	3.0	3.8	0	7.44	5.80	2.1	1.5	6.2	1,200.7	18.2	0.0	4.5	5.7	0.0	40.4	1,269.5
Lampung	166.9	215.0	381.9	7.1	0.0	3.9	17.4	0	9.3	7.25	4.2	1.5	6.2	3,551.8	51.2	0.0	5.8	26.1	0.0	299.4	3,934.4
D.K.I. Jakarta	1.4	0.0	1.4	0.3	0.0	0.0	0.0	0	0	0.00	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jawa Barat	672.4	0.0	672.4	45.5	142.3	0.7	2.2	0.58	11.7	11.39	5.5	1.5	6.5	7,867.2	518.8	782.8	1.1	3.3	3.8	597.4	9,774.3
Jawa Tengah	783.0	0.0	783.0	5.2	228.6	1.1	0.5	1.91	11.05	10.76	5.5	1.5	6.5	8,652.2	55.6	1,257.1	1.7	0.8	12.4	265.3	10,245.1
D.I. Yogyakarta	45.6	0.0	45.6	2.9	0.0	0.0	0.0	1.22	11.05	10.76	5.5	1.5	6.5	504.2	31.3	0.0	0.0	0.0	7.9	140.1	683.5
Jawa Timur	832.0	0.0	832.0	6.5	143.6	1.7	0.6	2.216	9.1	8.86	4.95	1.5	6.5	7,570.8	57.8	710.6	2.6	1.0	14.4	374.1	8,731.3
Bali	74.5	0.0	74.5	3.5	0.0	0.0	0.0	0.46	11.7	11.39	5.5	1.5	6.5	871.5	39.5	0.0	0.0	0.0	3.0	3.0	916.9
Nusa Tenggara Barat	201.8	0.0	201.8	12.6	16.2	0.0	0.0	0.345	8.4	7.25	4.05	1.5	6	1,694.8	91.2	65.7	0.0	0.0	2.1	30.2	1,883.9
Nusa Tenggara Timur	86.8	18.2	105.0	8.5	9.9	0.0	0.4	0.585	4.08	3.22	1.75	1.5	5.1	428.5	27.5	17.3	0.0	0.6	3.0	110.3	587.2
Timor Timur	12.8	26.9	39.8	1.8	0.0	0.0	16.7	0	3.36	2.66	2.31	1.68	4.8	133.7	4.8	0.0	0.0	28.1	0.0	0.0	166.6
Kalimantan Barat	94.9	1,125.1	1,219.9	2.6	0.0	62.4	27.3	0	3.15	2.82	1.75	1.08	4.5	3,842.8	7.2	0.0	67.4	29.4	0.0	209.7	4,156.5
Kalimantan Tengah	48.5	818.3	866.8	1.3	0.0	55.3	2.2	0	3.42	3.21	1.86	1	3.8	2,964.5	4.3	0.0	55.3	2.2	0.0	94.1	3,120.5
Kalimantan Selatan	70.1	431.0	501.2	2.4	0.0	127.2	71.3	0	6.24	5.24	3.5	2.4	4.8	3,127.4	12.8	0.0	305.4	171.2	0.0	75.0	3,691.8
Kalimantan Timur	16.5	1,247.8	1,264.4	2.4	0.0	4.9	20.7	0	4.5	4.03	1.75	1.08	4.5	5,689.7	9.6	0.0	5.3	22.3	0.0	141.4	5,868.3
Sulawesi Utara	74.2	40.4	114.6	2.5	0.0	0.0	0.0	0	8.96	7.25	4.05	1.5	6.4	1,026.7	18.0	0.0	0.0	0.0	0.0	23.1	1,067.8
Sulawesi Tengah	167.1	63.6	230.8	2.2	0.0	0.7	1.1	0	6.38	5.06	2.8	2.1	5.8	1,472.4	11.0	0.0	1.4	2.3	0.0	18.2	1,505.2
Sulawesi Selatan	325.7	108.0	433.7	22.7	133.6	2.8	0.0	0.2	10.24	8.29	4.5	1.5	6.4	4,441.4	188.1	601.0	4.3	0.0	1.3	25.6	5,261.6
Sulawesi Tenggara	54.8	121.7	176.5	2.6	0.0	0.5	0.0	0	6.96	5.52	3.2	1.5	5.8	1,228.6	14.2	0.0	0.7	0.0	0.0	22.5	1,266.0
Maluku	2.9	361.0	363.9	1.3	0.0	0.0	0.0	0	5.85	5.24	3.5	1.5	4.5	2,129.0	6.7	0.0	0.0	0.0	0.0	4.7	2,140.5
Irian Jaya	21.1	2,142.3	2,163.3	0.0	0.0	0.8	0.0	0	5.85	5.24	3.5	1.5	4.5	12,655.6	0.1	0.0	1.2	0.0	0.0	5.5	12,662.4
Indonesia	4,759.7	10,083.0	14,842.7	184.4	721.4	481.7	346.8	7.5						111,419.8	1,523.0	3,633.2	927.4	740.8	47.8	3,172.1	121,464.1
			0.0																		
Zone1	814.0	1,537.1	2,351.1	32.7	47.3	57.5	25.6	0.0						21,940		198.6	86.2	38.3	0.0	329.4	22,833.6
Zone2	359.4	2,041.4	2,400.8	24.9	0.0	166.0	178.3	0.0						23,179		0.0	394.9	441.3	0.0	702.6	24,901.1
Zone3	2,408.9	0.0	2,408.9	63.9	514.5	3.6	3.4	6.4						25,466		2,750.5	5.3	5.1	41.5	1,379.9	30,351.1
Zone4	230.0	3,622.3	3,852.3	8.7	0.0	249.9	121.4	0.0						15,624		0.0	433.4	225.1	0.0	520.2	16,837.1
Zone5	621.9	333.7	955.6	29.9	133.6	4.0	1.1	0.2						8,169		601.0	6.3	2.3	1.3	89.4	9,100.7
Zone6	325.5	2,548.4	2,873.8	24.2	26.1	0.8	17.1	0.9						17,042		83.0	1.2	28.7	5.1	150.7	17,440.6
Indonesia	4,759.7	10,083.0	14,842.7	184.4	721.4	481.7	346.8	7.5						111,420		3,633.2	927.4	740.8	47.8	3,172.1	121,464.1

Source : Team's estimate

Table10.6 Self-sufficiency in each Province upon Completion of all Schemes Except New Proposed Schemes

Code	Province	Maximum Paddy Production	Irrigation Schemes	Demand	Deficit	Self Sufficiency	Development Ratio	Required Development Ratio
		A	B	D	B-D	B/D	B/A	D/A
		1000 ton	1000 ton	1000 ton	1000 ton	%	%	%
11	D.I. Aceh	2,729	1,849	1,815	34	101.9%	67.7%	66.5%
12	Sumatera Utara	5,994	3,712	3,954	-242	93.9%	61.9%	66.0%
13	Sumatera Barat	5,011	2,794	1,805	989	154.8%	55.8%	36.0%
14	Riau	9,100	683	1,810	-1,127	37.7%	7.5%	19.9%
15	Jambi	5,602	912	1,280	-368	71.3%	16.3%	22.9%
16	Sumatera Selatan	14,096	1,857	3,066	-1,209	60.6%	13.2%	21.8%
17	Bengkulu	1,270	527	879	-351	60.0%	41.5%	69.2%
18	Lampung	3,934	1,948	2,854	-906	68.2%	49.5%	72.5%
31	D.K.I. Jakarta	0	0	2,568	-2,568	0.0%		
32	Jawa Barat	9,774	9,774	15,358	-5,584	63.6%	100.0%	157.1%
33	Jawa Tengah	10,245	10,245	7,485	2,760	136.9%	100.0%	73.1%
34	D.I. Yogyakarta	683	683	576	108	118.7%	100.0%	84.3%
35	Jawa Timur	8,731	8,731	8,197	534	106.5%	100.0%	93.9%
51	Bali	917	917	963	-46	95.2%	100.0%	105.0%
52	Nusa Tenggara Barat	1,884	1,884	1,498	386	125.8%	100.0%	79.5%
53	Nusa Tenggara Timur	587	523	995	-473	52.5%	89.0%	169.5%
54	Timor Timur	167	76	209	-133	36.3%	45.6%	125.6%
61	Kalimantan Barat	4,157	926	1,478	-552	62.7%	22.3%	35.6%
62	Kalimantan Tengah	3,120	421	822	-401	51.2%	13.5%	26.3%
63	Kalimantan Selatan	3,692	1,331	1,100	232	121.1%	36.1%	29.8%
64	Kalimantan Timur	5,868	329	1,307	-978	25.2%	5.6%	22.3%
71	Sulawesi Utara	1,068	708	888	-180	79.7%	66.3%	83.1%
72	Sulawesi Tengah	1,505	1,099	850	249	129.3%	73.0%	56.5%
73	Sulawesi Selatan	5,262	4,302	2,973	1,329	144.7%	81.8%	56.5%
74	Sulawesi Tenggara	1,266	424	613	-189	69.2%	33.5%	48.4%
81	Maluku	2,140	29	559	-530	5.1%	1.3%	26.1%
82	Irian Jaya	12,662	130	581	-451	22.4%	1.0%	4.6%
	Indonesia	121,464	56,816	66,485	-9,668	85.5%	46.8%	54.7%
	Zone1	22,834	9,038	9,385	-347	96.3%	39.6%	41.1%
	Zone2	24,901	5,245	8,079	-2,834	64.9%	21.1%	32.4%
	Zone3	30,351	30,351	35,147	-4,796	86.4%	100.0%	115.8%
	Zone4	16,837	3,008	4,708	-1,699	63.9%	17.9%	28.0%
	Zone5	9,101	6,533	5,324	1,209	122.7%	71.8%	58.5%
	Zone6	17,441	2,642	3,842	-1,201	68.8%	15.1%	22.0%
	Indonesia	121,464	56,816	66,485	-9,668	85.5%	46.8%	54.7%

Source : Team's estimate

Table10.7 Development Potential Area in 2020 by Province

(1000 ha)

Code		Irr. Area 1990 A	Expandable area B	Converted Land C	Potential area D=A+B+C	All program area *1 2020 E	Dev. Potential Area F=D-E
11	D.I. Aceh	167.2	263.1	0.0	430.3	252.1	178.2
12	Sumatera Utara	269.8	366.6	-25.5	610.9	327.1	283.8
13	Sumatera Barat	159.9	283.6	0.0	443.5	232.0	211.5
14	Riau	23.3	875.8	0.0	899.1	35.5	863.6
15	Jambi	28.2	500.4	0.0	528.6	50.7	477.9
16	Sumatera Selatan	69.4	1,274.2	0.0	1,343.6	95.9	1,247.8
17	Bengkulu	46.7	117.8	0.0	164.5	63.8	100.7
18	Lampung	135.3	290.7	-37.0	389.0	174.0	215.0
31	D.K.I. Jakarta	3.7	0.0	-4.2	-0.5	1.7	0.0
32	Jawa Barat	902.3	62.3	-287.5	677.1	717.9	0.0
33	Jawa Tengah	680.5	0.0	-107.5	573.0	788.2	0.0
34	D.I. Yogyakarta	51.9	0.0	-15.8	36.1	48.5	0.0
35	Jawa Timur	897.3	0.0	-265.0	632.3	838.5	0.0
51	Bali	91.4	0.0	-30.0	61.4	77.9	0.0
52	Nusa Tenggara Barat	153.9	6.4	0.0	160.3	214.3	0.0
53	Nusa Tenggara Timur	63.2	50.4	0.0	113.6	95.4	18.2
54	Timor Timur	8.0	33.6	0.0	41.6	14.6	26.9
61	Kalimantan Barat	86.6	1,135.9	0.0	1,222.5	97.4	1,125.1
62	Kalimantan Tengah	47.0	821.2	0.0	868.2	49.8	818.3
63	Kalimantan Selatan	25.3	478.3	0.0	503.6	72.6	431.0
64	Kalimantan Timur	9.6	1,257.2	0.0	1,266.8	18.9	1,247.8
71	Sulawesi Utara	48.9	68.2	0.0	117.1	76.7	40.4
72	Sulawesi Tengah	97.7	135.2	0.0	232.9	169.3	63.6
73	Sulawesi Selatan	317.8	173.6	-35.0	456.4	348.4	108.0
74	Sulawesi Tenggara	32.5	146.6	0.0	179.1	57.4	121.7
81	Maluku	1.3	363.9	0.0	365.2	4.2	361.0
82	Irian Jaya	3.2	2,160.2	0.0	2,163.4	21.1	2,142.3
	Indonesia	4,421.9	10,865.2	-807.5	14,479.6	4,944.1	10,083.0
	Zone1	620.3	1,789.1	-25.5	2,383.9	846.7	1,537.1
	Zone2	279.6	2,183.1	-37.0	2,425.7	384.3	2,041.4
	Zone3	2,627.1	62.3	-710.0	1,979.4	2,472.8	0.0
	Zone4	168.5	3,692.6	0.0	3,861.1	238.8	3,622.3
	Zone5	496.9	523.6	-35.0	985.5	651.8	333.7
	Zone6	229.5	2,614.5	0.0	2,844.0	349.7	2,548.4
	Indonesia	4,421.9	10,865.2	-807.5	14,479.6	4,944.1	10,083.0

*1; Irrigation area upon completion of all program except new construction schems
Source : Team's estimate

Table10.8 Irrigation Development Area

(present program + new construction schemes)

Unit : 1000 ha

Code	Province	1991~ 1995	1996~ 2000	2001~ 2005	2006~ 2010	2011~ 2015	2016~ 2020
11	D.I. Aceh	65.5	45.4	48.6	1.6	1.0	0.6
12	Sumatera Utara	112.5	53.9	54.0	15.2	2.0	1.2
13	Sumatera Barat	76.9	29.6	25.2	13.7	10.0	1.2
14	Riau	2.1	14.4	126.6	8.3	0.0	0.0
15	Jambi	9.8	13.3	36.6	52.3	32.2	0.0
16	Sumatera Selatan	13.7	25.2	91.5	103.5	76.4	0.0
17	Bengkulu	16.0	9.4	19.9	10.0	0.0	0.0
18	Lampung	42.4	40.4	14.4	23.8	35.2	0.0
31	D.K.I. Jakarta	4.0	2.4	0.3	0.0	0.0	0.0
32	Jawa Barat	141.4	79.3	48.3	3.0	3.0	1.8
33	Jawa Tengah	186.7	22.5	17.4	5.4	0.0	0.0
34	D.I. Yogyakarta	25.3	5.5	3.7	0.6	0.0	0.0
35	Jawa Timur	260.9	19.4	15.3	9.0	9.4	6.0
51	Bali	15.1	14.7	5.3	2.0	2.4	1.8
52	Nusa Tenggara Barat	61.5	23.8	12.3	0.0	0.0	0.0
53	Nusa Tenggara Timur	26.0	22.4	15.7	1.0	1.0	0.6
54	Timor Timur	4.8	4.8	8.3	13.5	7.0	0.6
61	Kalimantan Barat	10.9	5.4	17.2	30.0	27.9	0.0
62	Kalimantan Tengah	2.1	2.2	15.6	11.5	11.5	0.0
63	Kalimantan Selatan	37.5	7.9	25.9	20.7	11.5	0.0
64	Kalimantan Timur	3.8	4.2	6.7	5.0	4.0	0.0
71	Sulawesi Utara	9.5	22.7	17.0	4.1	1.0	0.6
72	Sulawesi Tengah	48.9	27.7	27.6	2.0	1.2	0.0
73	Sulawesi Selatan	65.4	66.7	101.7	2.6	1.2	0.0
74	Sulawesi Tenggara	9.6	10.3	16.2	22.8	19.6	0.6
81	Maluku	3.0	2.9	13.8	13.8	0.4	0.6
82	Irian Jaya	3.3	9.8	8.0	5.0	3.4	0.6
	Indonesia	1,258.6	586.3	793.2	380.3	261.3	16.2
	Zone1	257.1	143.3	254.4	38.8	13.0	3.0
	Zone2	81.9	88.4	162.4	189.5	143.8	0.0
	Zone3	633.3	143.7	90.3	20.0	14.8	9.6
	Zone4	54.3	19.7	65.5	67.2	54.9	0.0
	Zone5	133.4	127.4	162.5	31.5	23.0	1.2
	Zone6	98.6	63.8	58.1	33.3	11.8	2.4
	Indonesia	1,258.6	586.3	793.2	380.3	261.3	16.2

Source : Team's estimate

Table 10.9 Paddy Production

(present program + new construction schemes)

Code	Province	Deamnd (Unit : 1000 ton)						Supply (Unit : 1000 ton)						Balance (Unit : 1000 ton)					
		Year						Year						Year					
		1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020
11	D.I. Aceh	1,254	1,412	1,560	1,699	1,774	1,815	1,304	1,539	1,743	1,936	2,001	2,066	50	127	183	237	228	251
12	Sumatera Utara	3,279	3,532	3,735	3,912	3,941	3,954	2,983	3,423	3,824	4,191	4,256	4,288	-296	-109	89	279	315	333
13	Sumatera Barat	1,419	1,544	1,651	1,749	1,785	1,805	1,925	2,407	2,652	2,866	3,085	3,214	506	863	1,000	1,116	1,300	1,408
14	Riau	1,011	1,196	1,390	1,585	1,727	1,810	474	579	1,087	1,871	1,950	2,012	-537	-617	-302	285	223	202
15	Jambi	752	880	1,011	1,142	1,230	1,280	604	737	872	1,310	1,829	2,031	-148	-143	-140	169	599	750
16	Sumatera Selatan	1,988	2,260	2,531	2,796	2,966	3,066	1,463	1,623	1,947	2,842	3,875	4,366	-525	-637	-583	45	909	1,300
17	Bengkulu	478	570	666	765	837	879	356	438	540	653	718	740	-122	-131	-127	-112	-119	-139
18	Lampung	1,897	2,133	2,368	2,603	2,758	2,854	1,531	1,896	2,027	2,141	2,396	2,570	-365	-237	-341	-462	-363	-283
31	D.K.I. Jakarta	2,018	2,192	2,338	2,477	2,533	2,568	35	31	0	0	0	0	-1,983	-2,161	-2,338	-2,477	-2,533	-2,568
32	Jawa Barat	11,589	12,806	13,864	14,823	15,179	15,358	10,770	11,162	11,089	10,921	10,428	9,788	-819	-1,644	-2,775	-3,902	-4,751	-5,570
33	Jawa Tengah	6,800	7,137	7,356	7,550	7,504	7,485	9,029	10,049	10,452	10,589	10,510	10,284	2,229	2,912	3,096	3,040	3,006	2,799
34	D.I. Yogyakarta	604	612	607	604	585	576	684	755	788	792	753	703	80	143	181	188	168	127
35	Jawa Timur	7,285	7,674	7,944	8,193	8,188	8,197	8,806	9,455	9,588	9,491	9,217	8,801	1,521	1,781	1,644	1,298	1,029	604
51	Bali	874	920	950	975	967	963	931	1,059	1,067	1,057	1,030	984	57	139	118	82	63	21
52	Nusa Tenggara Barat	1,151	1,253	1,344	1,431	1,472	1,498	1,365	1,611	1,698	1,762	1,826	1,890	214	358	355	331	354	392
53	Nusa Tenggara Timur	715	790	859	928	969	995	350	424	488	525	556	585	-365	-366	-371	-403	-414	-410
54	Timor Timur	143	160	176	192	203	209	48	59	78	114	159	182	-95	-101	-98	-79	-44	-28
61	Kalimantan Barat	1,005	1,130	1,250	1,367	1,437	1,478	724	767	814	914	1,030	1,123	-281	-362	-436	-453	-407	-356
62	Kalimantan Tengah	499	580	662	742	793	822	312	331	363	421	480	529	-186	-249	-299	-321	-313	-293
63	Kalimantan Selatar	782	872	956	1,035	1,076	1,100	1,035	1,121	1,242	1,420	1,551	1,644	254	249	286	385	474	545
64	Kalimantan Timur	648	793	948	1,110	1,234	1,307	231	266	294	327	362	388	-417	-527	-654	-782	-872	-920
71	Sulawesi Utara	702	761	810	857	876	888	418	554	749	878	922	955	-284	-206	-61	22	46	67
72	Sulawesi Tengah	542	622	699	774	822	850	518	801	1,049	1,215	1,290	1,358	-25	180	351	441	467	507
73	Sulawesi Selatan	2,279	2,486	2,669	2,843	2,924	2,973	3,488	3,875	4,387	4,805	4,852	4,877	1,209	1,389	1,719	1,961	1,928	1,904
74	Sulawesi Tenggara	345	406	469	535	584	613	210	338	434	572	746	862	-136	-68	-36	37	162	249
81	Maluku	346	396	445	496	535	559	19	24	61	130	178	193	-327	-372	-385	-367	-357	-366
82	Irian Jaya	317	374	435	499	550	581	36	86	150	185	228	252	-281	-288	-285	-313	-322	-329
	Indonesia	50,723	55,488	59,694	63,682	65,450	66,485	49,651	55,409	59,484	63,928	66,228	66,685	-1,072	-79	-209	246	778	201
	Zone1	6,963	7,684	8,336	8,946	9,227	9,385	6,687	7,947	9,306	10,863	11,293	11,580	-276	263	970	1,917	2,066	2,195
	Zone2	5,114	5,842	6,576	7,306	7,791	8,079	3,955	4,694	5,385	6,946	8,818	9,708	-1,160	-1,148	-1,191	-360	1,027	1,629
	Zone3	29,170	31,341	33,059	34,621	34,957	35,147	30,255	32,510	32,985	32,850	31,939	30,561	1,084	1,169	-75	-1,771	-3,019	-4,586
	Zone4	2,934	3,374	3,817	4,254	4,541	4,708	2,303	2,485	2,714	3,083	3,423	3,684	-631	-889	-1,103	-1,171	-1,118	-1,024
	Zone5	3,869	4,274	4,647	5,009	5,205	5,324	4,634	5,569	6,619	7,470	7,809	8,052	764	1,295	1,972	2,461	2,604	2,728
	Zone6	2,672	2,973	3,259	3,547	3,729	3,842	1,818	2,204	2,475	2,716	2,946	3,101	-854	-769	-784	-830	-783	-741
	Indonesia	50,723	55,488	59,694	63,682	65,450	66,485	49,651	55,409	59,484	63,928	66,228	66,685	-1,072	-79	-209	246	778	201

Source : Team's estimate

Table 10.10 Selection Criteria for Irrigation Development

	New development	Rehabilitation	Swamp reclamation	Swamp rehabil.
Technical aspect	1. Sufficient water 2. Paddy field 10% of total area; yield >1.5 ton/ha 3. land ownership status and its legality adequate 4. Free from flood with good drainage 5. Adequate soil 6. Proper farmers' farming ability 7. Availability of ransportation, storage and market 8. Accessibility 9. Other supportive structures and infrastructure 10 Existence of P3A	1. Existing facilities should functioning and need to be improved 2. Contribute to increase production 3. Irrigation area between 150 and 300 ha and free from flood. 4. Implemented under coordination of Provincial PU or Regional PU. 5. Completed SID, Detailed design and no delay of land development.	1. Good drainage system 2. Avoidance from peat. 3. No disturbance of the existing water-balance 4. Free from intrusion of sea water. 5. Assured transportation system 6. Existence of P3A	1. Existing facilities should functioning and need to be improved 2. Contribute to increase production 3. Area between 1000 and 5000 ha with good drainage 4. Implemented under coordination of Provincial PU or Regional PU. 5. Existence of P3A 6. Completed SID, Detailed design and no delay of land development.
Economical aspect	1. Farmers benefit >10% 2. ERR>10% 3. development cost US$3,000-5000/ha	1. Farmers benefit >10% 2. ERR>12%	1. Farmers benefit >8% 2. ERR>8% 3. development cost US$1000/ha	1. Farmers benefit >10% 2. ERR>10% 3. development cost US$500/ha
Social aspect	1. Water use not disturb downstream 2. Coordination with local people 3. No program on land conversion 4. Support by local people 5. Real benefit to farmers	1. Support of local people 2. Real benefit to farmers	1. Coordination with local people 2. Real benefit to farmers 3. Increase of need of food, clothing and housing socially	1. Support of local people 2. Real benefit to farmers
Environmental aspect	1. Maintain ecological system 2. Preparation of AMDAL and conduct Monitoring	1. Maintain ecological system 2. Preparation of AMDAL and conduct Monitoring	1. Maintain ecological system 2. Preparation of AMDAL and conduct Monitoring	1. Maintain ecological system 2. Preparation of AMDAL and conduct Monitoring

Table10.11 Target Development Area for Repelita VI

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale
11	D.I. Aceh	0.0	39.0	6.3	1.2	13.5
12	Sumatera Utara	8.3	1.7	59.6	1.0	24.0
13	Sumatera Barat	0.0	5.0	27.1	1.0	15.0
14	Riau	0.0	0.0	0.8	0.0	0.5
15	Jambi	0.0	13.0	2.0	0.0	5.5
16	Sumatera Selatan	0.0	0.0	1.1	0.0	18.5
17	Bengkulu	0.0	0.0	12.2	0.0	5.0
18	Lampung	0.0	0.1	34.0	2.0	11.5
31	D.K.I. Jakarta	0.0	0.0	5.7	0.0	0.5
32	Jawa Barat	0.5	2.5	7.8	2.0	75.5
33	Jawa Tengah	0.0	0.3	16.9	15.0	8.0
34	D.I. Yogyakarta	0.0	0.2	5.4	1.0	4.5
35	Jawa Timur	0.0	0.0	156.9	8.0	10.5
51	Bali	0.0	0.0	16.3	1.4	5.5
52	Nusa Tenggara Barat	1.2	6.2	1.2	3.0	20.5
53	Nusa Tenggara Timur	0.4	0.0	10.3	1.5	13.0
54	Timor Timur	1.0	0.3	0.0	0.3	3.0
61	Kalimantan Barat	0.8	1.1	0.0	0.0	3.5
62	Kalimantan Tengah	0.0	0.2	0.3	0.0	2.0
63	Kalimantan Selatan	0.3	0.3	0.1	0.0	3.5
64	Kalimantan Timur	0.0	0.0	0.4	0.0	3.5
71	Sulawesi Utara	1.2	7.7	4.1	1.2	3.5
72	Sulawesi Tengah	8.0	10.8	20.1	1.7	3.0
73	Sulawesi Selatan	12.5	0.2	15.2	2.5	37.5
74	Sulawesi Tenggara	2.0	0.4	1.5	0.3	3.0
81	Maluku	0.0	0.1	0.9	0.1	2.0
82	Irian Jaya	0.0	5.0	0.8	0.1	0.0
	Indonesia	36.4	94.0	406.9	43.2	296.0
	Zone1	8.3	45.6	93.9	3.2	53.0
	Zone2	0.0	13.1	49.3	2.0	40.5
	Zone3	0.5	3.0	208.8	27.4	104.5
	Zone4	1.2	1.6	0.8	0.0	12.5
	Zone5	23.8	19.0	40.9	5.7	47.0
	Zone6	2.6	11.6	13.1	4.9	38.5
	Indonesia	36.4	94.0	406.9	43.2	296.0

Source : Team's estimate

Table10.12 Target Development Area for Repelita VII

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale
11	D.I. Aceh	29.7	4.1	0.0	2.0	13.5
12	Sumatera Utara	47.5	0.0	0.0	1.0	24.0
13	Sumatera Barat	14.8	0.0	0.0	1.0	15.0
14	Riau	92.0	0.0	0.0	0.0	0.5
15	Jambi	13.4	0.0	0.0	0.0	5.5
16	Sumatera Selatan	37.4	0.0	0.0	0.0	18.5
17	Bengkulu	15.0	0.0	0.0	0.0	5.0
18	Lampung	4.9	0.0	0.0	1.0	11.5
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.5
32	Jawa Barat	0.0	0.0	0.0	3.0	75.5
33	Jawa Tengah	0.0	0.0	0.0	15.0	8.0
34	D.I. Yogyakarta	0.0	0.0	0.0	1.0	4.5
35	Jawa Timur	0.0	0.0	0.0	9.0	10.5
51	Bali	0.0	0.0	0.0	2.0	5.5
52	Nusa Tenggara Barat	0.0	0.0	0.0	0.0	20.5
53	Nusa Tenggara Timur	12.1	0.0	0.0	1.0	13.0
54	Timor Timur	5.9	0.0	0.0	0.0	3.0
61	Kalimantan Barat	3.6	0.0	0.0	0.0	3.5
62	Kalimantan Tengah	8.1	0.0	0.0	0.0	2.0
63	Kalimantan Selatan	20.8	0.0	0.0	0.0	3.5
64	Kalimantan Timur	3.3	0.0	0.0	0.0	3.5
71	Sulawesi Utara	13.8	0.0	0.0	1.0	3.5
72	Sulawesi Tengah	23.4	4.4	0.0	2.0	3.0
73	Sulawesi Selatan	53.8	2.5	0.0	3.0	37.5
74	Sulawesi Tenggara	12.4	0.0	0.0	1.0	3.0
81	Maluku	11.5	0.0	0.0	0.0	2.0
82	Irian Jaya	11.3	0.0	0.0	0.0	0.0
	Indonesia	434.8	11.0	0.0	43.0	296.0
	Zone1	184.1	4.1	0.0	4.0	53.0
	Zone2	70.7	0.0	0.0	1.0	40.5
	Zone3	0.0	0.0	0.0	30.0	104.5
	Zone4	35.9	0.0	0.0	0.0	12.5
	Zone5	103.5	6.9	0.0	7.0	47.0
	Zone6	40.7	0.0	0.0	1.0	38.5
	Indonesia	434.8	11.0	0.0	43.0	296.0

Source : Team's estimate

Table10.13 Target Development Area for Repelita VIII

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale
11	D.I. Aceh	12.3	0.0	0.0	2.0	0.0
12	Sumatera Utara	28.0	0.0	0.0	2.0	0.0
13	Sumatera Barat	10.5	0.0	0.0	2.0	0.0
14	Riau	56.4	0.0	0.0	0.0	0.0
15	Jambi	52.2	0.0	0.0	0.0	0.0
16	Sumatera Selatan	113.2	0.0	0.0	0.0	0.0
17	Bengkulu	10.2	0.0	0.0	0.0	0.0
18	Lampung	10.8	0.0	0.0	0.0	0.0
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0
32	Jawa Barat	0.0	0.0	0.0	3.0	0.0
33	Jawa Tengah	0.0	0.0	0.0	9.0	0.0
34	D.I. Yogyakarta	0.0	0.0	0.0	1.0	0.0
35	Jawa Timur	0.0	0.0	0.0	9.0	0.0
51	Bali	0.0	0.0	0.0	2.0	0.0
52	Nusa Tenggara Barat	0.0	0.0	0.0	0.0	0.0
53	Nusa Tenggara Timur	0.2	0.0	0.0	1.0	0.0
54	Timor Timur	10.4	0.0	0.0	1.0	0.0
61	Kalimantan Barat	31.4	0.0	0.0	0.0	0.0
62	Kalimantan Tengah	13.2	0.0	0.0	0.0	0.0
63	Kalimantan Selatan	23.4	0.0	0.0	0.0	0.0
64	Kalimantan Timur	5.0	0.0	0.0	0.0	0.0
71	Sulawesi Utara	8.5	0.0	0.0	1.0	0.0
72	Sulawesi Tengah	9.1	0.0	0.0	2.0	0.0
73	Sulawesi Selatan	34.2	0.0	0.0	3.0	0.0
74	Sulawesi Tenggara	18.7	0.0	0.0	1.0	0.0
81	Maluku	13.7	0.0	0.0	0.0	0.0
82	Irian Jaya	3.7	0.0	0.0	0.0	0.0
	Indonesia	465.2	0.0	0.0	39.0	0.0
	Zone1	107.2	0.0	0.0	6.0	0.0
	Zone2	186.4	0.0	0.0	0.0	0.0
	Zone3	0.0	0.0	0.0	24.0	0.0
	Zone4	73.0	0.0	0.0	0.0	0.0
	Zone5	70.6	0.0	0.0	7.0	0.0
	Zone6	28.0	0.0	0.0	2.0	0.0
	Indonesia	465.2	0.0	0.0	39.0	0.0

Source : Team's estimate

Table10.14 Target Development Area for Repelita IX

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale
11	D.I. Aceh	0.0	0.0	0.0	1.0	0.0
12	Sumatera Utara	0.0	0.0	0.0	2.0	0.0
13	Sumatera Barat	14.0	0.0	0.0	2.0	0.0
14	Riau	0.0	0.0	0.0	0.0	0.0
15	Jambi	47.9	0.0	0.0	0.0	0.0
16	Sumatera Selatan	97.2	0.0	0.0	0.0	0.0
17	Bengkulu	4.0	0.0	0.0	0.0	0.0
18	Lampung	40.4	0.0	0.0	0.0	0.0
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0
32	Jawa Barat	0.0	0.0	0.0	3.0	0.0
33	Jawa Tengah	0.0	0.0	0.0	0.0	0.0
34	D.I. Yogyakarta	0.0	0.0	0.0	0.0	0.0
35	Jawa Timur	0.0	0.0	0.0	9.0	0.0
51	Bali	0.0	0.0	0.0	2.0	0.0
52	Nusa Tenggara Barat	0.0	0.0	0.0	0.0	0.0
53	Nusa Tenggara Timur	0.0	0.0	0.0	1.0	0.0
54	Timor Timur	10.0	0.0	0.0	1.0	0.0
61	Kalimantan Barat	30.0	0.0	0.0	0.0	0.0
62	Kalimantan Tengah	11.5	0.0	0.0	0.0	0.0
63	Kalimantan Selatan	11.5	0.0	0.0	0.0	0.0
64	Kalimantan Timur	5.0	0.0	0.0	0.0	0.0
71	Sulawesi Utara	0.5	0.0	0.0	1.0	0.0
72	Sulawesi Tengah	0.0	0.0	0.0	2.0	0.0
73	Sulawesi Selatan	0.0	0.0	0.0	2.0	0.0
74	Sulawesi Tenggara	21.0	0.0	0.0	1.0	0.0
81	Maluku	2.0	0.0	0.0	0.0	0.0
82	Irian Jaya	5.0	0.0	0.0	0.0	0.0
	Indonesia	299.9	0.0	0.0	27.0	0.0
	Zone1	14.0	0.0	0.0	5.0	0.0
	Zone2	189.5	0.0	0.0	0.0	0.0
	Zone3	0.0	0.0	0.0	14.0	0.0
	Zone4	58.0	0.0	0.0	0.0	0.0
	Zone5	21.5	0.0	0.0	6.0	0.0
	Zone6	17.0	0.0	0.0	2.0	0.0
	Indonesia	299.9	0.0	0.0	27.0	0.0

Source : Team's estimate

Table10.15 Target Development Area for Repelita X

Unit : 1000 ha

Code	Province	New Construction	Extension	Rehabili-tation	Ground water	Small Scale
11	D.I. Aceh	0.0	0.0	0.0	1.0	0.0
12	Sumatera Utara	0.0	0.0	0.0	2.0	0.0
13	Sumatera Barat	0.0	0.0	0.0	2.0	0.0
14	Riau	0.0	0.0	0.0	0.0	0.0
15	Jambi	4.3	0.0	0.0	0.0	0.0
16	Sumatera Selatan	19.2	0.0	0.0	0.0	0.0
17	Bengkulu	0.0	0.0	0.0	0.0	0.0
18	Lampung	9.8	0.0	0.0	0.0	0.0
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0
32	Jawa Barat	0.0	0.0	0.0	3.0	0.0
33	Jawa Tengah	0.0	0.0	0.0	0.0	0.0
34	D.I. Yogyakarta	0.0	0.0	0.0	0.0	0.0
35	Jawa Timur	0.0	0.0	0.0	10.0	0.0
51	Bali	0.0	0.0	0.0	3.0	0.0
52	Nusa Tenggara Barat	0.0	0.0	0.0	0.0	0.0
53	Nusa Tenggara Timur	0.0	0.0	0.0	1.0	0.0
54	Timor Timur	0.0	0.0	0.0	1.0	0.0
61	Kalimantan Barat	9.9	0.0	0.0	0.0	0.0
62	Kalimantan Tengah	4.6	0.0	0.0	0.0	0.0
63	Kalimantan Selatan	4.6	0.0	0.0	0.0	0.0
64	Kalimantan Timur	1.0	0.0	0.0	0.0	0.0
71	Sulawesi Utara	0.0	0.0	0.0	1.0	0.0
72	Sulawesi Tengah	0.0	0.0	0.0	0.0	0.0
73	Sulawesi Selatan	0.0	0.0	0.0	0.0	0.0
74	Sulawesi Tenggara	6.6	0.0	0.0	1.0	0.0
81	Maluku	0.0	0.0	0.0	1.0	0.0
82	Irian Jaya	0.0	0.0	0.0	1.0	0.0
	Indonesia	60.0	0.0	0.0	27.0	0.0
	Zone1	0.0	0.0	0.0	5.0	0.0
	Zone2	33.3	0.0	0.0	0.0	0.0
	Zone3	0.0	0.0	0.0	16.0	0.0
	Zone4	20.1	0.0	0.0	0.0	0.0
	Zone5	6.6	0.0	0.0	2.0	0.0
	Zone6	0.0	0.0	0.0	4.0	0.0
	Indonesia	60.0	0.0	0.0	27.0	0.0

Source : Team's estimate

Table10.16 Repelita's Target Development Area

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	60.0	49.3	14.3	1.0	1.0	125.6
12	Sumatera Utara	94.7	72.5	30.0	2.0	2.0	201.2
13	Sumatera Barat	48.1	30.8	12.5	16.0	2.0	109.4
14	Riau	1.3	92.5	56.4	0.0	0.0	150.2
15	Jambi	20.5	18.9	52.2	47.9	4.3	143.8
16	Sumatera Selatan	19.6	55.9	113.2	97.2	19.2	305.1
17	Bengkulu	17.2	20.0	10.2	4.0	0.0	51.4
18	Lampung	47.5	17.4	10.8	40.4	9.8	125.9
31	D.K.I. Jakarta	6.2	0.5	0.0	0.0	0.0	6.7
32	Jawa Barat	88.3	78.5	3.0	3.0	3.0	175.8
33	Jawa Tengah	40.2	23.0	9.0	0.0	0.0	72.2
34	D.I. Yogyakarta	11.1	5.5	1.0	0.0	0.0	17.6
35	Jawa Timur	175.4	19.5	9.0	9.0	10.0	222.9
51	Bali	23.2	7.5	2.0	2.0	3.0	37.7
52	Nusa Tenggara Barat	32.2	20.5	0.0	0.0	0.0	52.7
53	Nusa Tenggara Timur	25.3	26.1	1.2	1.0	1.0	54.5
54	Timor Timur	4.5	8.9	11.4	11.0	1.0	36.8
61	Kalimantan Barat	5.5	7.1	31.4	30.0	9.9	83.9
62	Kalimantan Tengah	2.5	10.1	13.2	11.5	4.6	41.9
63	Kalimantan Selatan	4.2	24.3	23.4	11.5	4.6	68.0
64	Kalimantan Timur	3.9	6.8	5.0	5.0	1.0	21.7
71	Sulawesi Utara	17.7	18.3	9.5	1.5	1.0	48.1
72	Sulawesi Tengah	43.6	32.8	11.1	2.0	0.0	89.5
73	Sulawesi Selatan	67.9	96.8	37.2	2.0	0.0	204.0
74	Sulawesi Tenggara	7.2	16.4	19.7	22.0	7.6	72.9
81	Maluku	3.0	13.5	13.7	2.0	1.0	33.2
82	Irian Jaya	5.9	11.3	3.7	5.0	1.0	26.9
	Indonesia	876.5	784.7	504.2	326.9	87.0	2,579.4
	Zone1	204.1	245.1	113.2	19.0	5.0	586.4
	Zone2	104.8	112.2	186.4	189.5	33.3	626.2
	Zone3	344.3	134.5	24.0	14.0	16.0	532.8
	Zone4	16.1	48.4	73.0	58.0	20.1	215.5
	Zone5	136.4	164.4	77.6	27.5	8.6	414.4
	Zone6	70.8	80.2	30.0	19.0	4.0	204.1
	Indonesia	876.5	784.7	504.2	326.9	87.0	2,579.4

Source : Team's estimate

Table10.17 Target Development Area for New Construction

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	0.0	29.7	12.3	0.0	0.0	42.0
12	Sumatera Utara	8.3	47.5	28.0	0.0	0.0	83.9
13	Sumatera Barat	0.0	14.8	10.5	14.0	0.0	39.3
14	Riau	0.0	92.0	56.4	0.0	0.0	148.4
15	Jambi	0.0	13.4	52.2	47.9	4.3	117.8
16	Sumatera Selatan	0.0	37.4	113.2	97.2	19.2	267.0
17	Bengkulu	0.0	15.0	10.2	4.0	0.0	29.2
18	Lampung	0.0	4.9	10.8	40.4	9.8	65.9
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0	0.0
32	Jawa Barat	0.5	0.0	0.0	0.0	0.0	0.5
33	Jawa Tengah	0.0	0.0	0.0	0.0	0.0	0.0
34	D.I. Yogyakarta	0.0	0.0	0.0	0.0	0.0	0.0
35	Jawa Timur	0.0	0.0	0.0	0.0	0.0	0.0
51	Bali	0.0	0.0	0.0	0.0	0.0	0.0
52	Nusa Tenggara Barat	1.2	0.0	0.0	0.0	0.0	1.2
53	Nusa Tenggara Timur	0.4	12.1	0.2	0.0	0.0	12.7
54	Timor Timur	1.0	5.9	10.4	10.0	0.0	27.2
61	Kalimantan Barat	0.8	3.6	31.4	30.0	9.9	75.7
62	Kalimantan Tengah	0.0	8.1	13.2	11.5	4.6	37.4
63	Kalimantan Selatan	0.3	20.8	23.4	11.5	4.6	60.6
64	Kalimantan Timur	0.0	3.3	5.0	5.0	1.0	14.3
71	Sulawesi Utara	1.2	13.8	8.5	0.5	0.0	24.1
72	Sulawesi Tengah	8.0	23.4	9.1	0.0	0.0	40.5
73	Sulawesi Selatan	12.5	53.8	34.2	0.0	0.0	100.5
74	Sulawesi Tenggara	2.0	12.4	18.7	21.0	6.6	60.8
81	Maluku	0.0	11.5	13.7	2.0	0.0	27.2
82	Irian Jaya	0.0	11.3	3.7	5.0	0.0	20.0
	Indonesia	36.4	434.8	465.2	299.9	60.0	1,296.3
	Zone1	8.3	184.1	107.2	14.0	0.0	313.5
	Zone2	0.0	70.7	186.4	189.5	33.3	479.8
	Zone3	0.5	0.0	0.0	0.0	0.0	0.5
	Zone4	1.2	35.9	73.0	58.0	20.1	188.1
	Zone5	23.8	103.5	70.6	21.5	6.6	225.9
	Zone6	2.6	40.7	28.0	17.0	0.0	88.3
	Indonesia	36.4	434.8	465.2	299.9	60.0	1,296.3

Source : Team's estimate

Table10.18 Target Development Area for Extension

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	39.0	4.1	0.0	0.0	0.0	43.0
12	Sumatera Utara	1.7	0.0	0.0	0.0	0.0	1.7
13	Sumatera Barat	5.0	0.0	0.0	0.0	0.0	5.0
14	Riau	0.0	0.0	0.0	0.0	0.0	0.0
15	Jambi	13.0	0.0	0.0	0.0	0.0	13.0
16	Sumatera Selatan	0.0	0.0	0.0	0.0	0.0	0.0
17	Bengkulu	0.0	0.0	0.0	0.0	0.0	0.0
18	Lampung	0.1	0.0	0.0	0.0	0.0	0.1
31	D.K.I. Jakarta	0.0	0.0	0.0	0.0	0.0	0.0
32	Jawa Barat	2.5	0.0	0.0	0.0	0.0	2.5
33	Jawa Tengah	0.3	0.0	0.0	0.0	0.0	0.3
34	D.I. Yogyakarta	0.2	0.0	0.0	0.0	0.0	0.2
35	Jawa Timur	0.0	0.0	0.0	0.0	0.0	0.0
51	Bali	0.0	0.0	0.0	0.0	0.0	0.0
52	Nusa Tenggara Barat	6.2	0.0	0.0	0.0	0.0	6.2
53	Nusa Tenggara Timur	0.0	0.0	0.0	0.0	0.0	0.0
54	Timor Timur	0.3	0.0	0.0	0.0	0.0	0.3
61	Kalimantan Barat	1.1	0.0	0.0	0.0	0.0	1.1
62	Kalimantan Tengah	0.2	0.0	0.0	0.0	0.0	0.2
63	Kalimantan Selatan	0.3	0.0	0.0	0.0	0.0	0.3
64	Kalimantan Timur	0.0	0.0	0.0	0.0	0.0	0.0
71	Sulawesi Utara	7.7	0.0	0.0	0.0	0.0	7.7
72	Sulawesi Tengah	10.8	4.4	0.0	0.0	0.0	15.1
73	Sulawesi Selatan	0.2	2.5	0.0	0.0	0.0	2.7
74	Sulawesi Tenggara	0.4	0.0	0.0	0.0	0.0	0.4
81	Maluku	0.1	0.0	0.0	0.0	0.0	0.1
82	Irian Jaya	5.0	0.0	0.0	0.0	0.0	5.0
	Indonesia	94.0	11.0	0.0	0.0	0.0	105.0
	Zone1	45.6	4.1	0.0	0.0	0.0	49.7
	Zone2	13.1	0.0	0.0	0.0	0.0	13.1
	Zone3	3.0	0.0	0.0	0.0	0.0	3.0
	Zone4	1.6	0.0	0.0	0.0	0.0	1.6
	Zone5	19.0	6.9	0.0	0.0	0.0	25.9
	Zone6	11.6	0.0	0.0	0.0	0.0	11.6
	Indonesia	94.0	11.0	0.0	0.0	0.0	105.0

Source : Team's estimate

Table10.19 Target Development Area for Rehabilitation

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	6.3	0.0	0.0	0.0	0.0	6.3
12	Sumatera Utara	59.6	0.0	0.0	0.0	0.0	59.6
13	Sumatera Barat	27.1	0.0	0.0	0.0	0.0	27.1
14	Riau	0.8	0.0	0.0	0.0	0.0	0.8
15	Jambi	2.0	0.0	0.0	0.0	0.0	2.0
16	Sumatera Selatan	1.1	0.0	0.0	0.0	0.0	1.1
17	Bengkulu	12.2	0.0	0.0	0.0	0.0	12.2
18	Lampung	34.0	0.0	0.0	0.0	0.0	34.0
31	D.K.I. Jakarta	5.7	0.0	0.0	0.0	0.0	5.7
32	Jawa Barat	7.8	0.0	0.0	0.0	0.0	7.8
33	Jawa Tengah	16.9	0.0	0.0	0.0	0.0	16.9
34	D.I. Yogyakarta	5.4	0.0	0.0	0.0	0.0	5.4
35	Jawa Timur	156.9	0.0	0.0	0.0	0.0	156.9
51	Bali	16.3	0.0	0.0	0.0	0.0	16.3
52	Nusa Tenggara Barat	1.2	0.0	0.0	0.0	0.0	1.2
53	Nusa Tenggara Timur	10.3	0.0	0.0	0.0	0.0	10.3
54	Timor Timur	0.0	0.0	0.0	0.0	0.0	0.0
61	Kalimantan Barat	0.0	0.0	0.0	0.0	0.0	0.0
62	Kalimantan Tengah	0.3	0.0	0.0	0.0	0.0	0.3
63	Kalimantan Selatan	0.1	0.0	0.0	0.0	0.0	0.1
64	Kalimantan Timur	0.4	0.0	0.0	0.0	0.0	0.4
71	Sulawesi Utara	4.1	0.0	0.0	0.0	0.0	4.1
72	Sulawesi Tengah	20.1	0.0	0.0	0.0	0.0	20.1
73	Sulawesi Selatan	15.2	0.0	0.0	0.0	0.0	15.2
74	Sulawesi Tenggara	1.5	0.0	0.0	0.0	0.0	1.5
81	Maluku	0.9	0.0	0.0	0.0	0.0	0.9
82	Irian Jaya	0.8	0.0	0.0	0.0	0.0	0.8
	Indonesia	406.9	0.0	0.0	0.0	0.0	406.9
	Zone1	93.9	0.0	0.0	0.0	0.0	93.9
	Zone2	49.3	0.0	0.0	0.0	0.0	49.3
	Zone3	208.8	0.0	0.0	0.0	0.0	208.8
	Zone4	0.8	0.0	0.0	0.0	0.0	0.8
	Zone5	40.9	0.0	0.0	0.0	0.0	40.9
	Zone6	13.1	0.0	0.0	0.0	0.0	13.1
	Indonesia	406.9	0.0	0.0	0.0	0.0	406.9

Source : Team's estimate

Table10.20 Target Development Area for Groundwater/Small Scale Irrigation

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	14.7	15.5	2.0	1.0	1.0	34.2
12	Sumatera Utara	25.0	25.0	2.0	2.0	2.0	56.0
13	Sumatera Barat	16.0	16.0	2.0	2.0	2.0	38.0
14	Riau	0.5	0.5	0.0	0.0	0.0	1.0
15	Jambi	5.5	5.5	0.0	0.0	0.0	11.0
16	Sumatera Selatan	18.5	18.5	0.0	0.0	0.0	37.0
17	Bengkulu	5.0	5.0	0.0	0.0	0.0	10.0
18	Lampung	13.5	12.5	0.0	0.0	0.0	26.0
31	D.K.I. Jakarta	0.5	0.5	0.0	0.0	0.0	1.0
32	Jawa Barat	77.5	78.5	3.0	3.0	3.0	165.0
33	Jawa Tengah	23.0	23.0	9.0	0.0	0.0	55.0
34	D.I. Yogyakarta	5.5	5.5	1.0	0.0	0.0	12.0
35	Jawa Timur	18.5	19.5	9.0	9.0	10.0	66.0
51	Bali	6.9	7.5	2.0	2.0	3.0	21.4
52	Nusa Tenggara Barat	23.5	20.5	0.0	0.0	0.0	44.0
53	Nusa Tenggara Timur	14.5	14.0	1.0	1.0	1.0	31.5
54	Timor Timur	3.3	3.0	1.0	1.0	1.0	9.3
61	Kalimantan Barat	3.5	3.5	0.0	0.0	0.0	7.0
62	Kalimantan Tengah	2.0	2.0	0.0	0.0	0.0	4.0
63	Kalimantan Selatan	3.5	3.5	0.0	0.0	0.0	7.0
64	Kalimantan Timur	3.5	3.5	0.0	0.0	0.0	7.0
71	Sulawesi Utara	4.7	4.5	1.0	1.0	1.0	12.2
72	Sulawesi Tengah	4.7	5.0	2.0	2.0	0.0	13.7
73	Sulawesi Selatan	40.0	40.5	3.0	2.0	0.0	85.5
74	Sulawesi Tenggara	3.3	4.0	1.0	1.0	1.0	10.3
81	Maluku	2.1	2.0	0.0	0.0	1.0	5.1
82	Irian Jaya	0.1	0.0	0.0	0.0	1.0	1.1
	Indonesia	339.2	339.0	39.0	27.0	27.0	771.2
	Zone1	56.2	57.0	6.0	5.0	5.0	129.2
	Zone2	42.5	41.5	0.0	0.0	0.0	84.0
	Zone3	131.9	134.5	24.0	14.0	16.0	320.4
	Zone4	12.5	12.5	0.0	0.0	0.0	25.0
	Zone5	52.7	54.0	7.0	6.0	2.0	121.7
	Zone6	43.4	39.5	2.0	2.0	4.0	90.9
	Indonesia	339.2	339.0	39.0	27.0	27.0	771.2

Source : Team's estimate

Table10.21 Target Development Area for Land Development

Unit : 1000 ha

Code	Province	Repelita VI	Repelita VII	Repelita VIII	Repelita IX	Repelita X	Total
11	D.I. Aceh	15.5	21.3	7.4	0.0	0.0	44.2
12	Sumatera Utara	27.9	16.6	19.5	0.0	0.0	63.9
13	Sumatera Barat	35.7	13.8	8.3	9.5	0.0	67.2
14	Riau	10.5	47.9	41.1	0.0	0.0	99.6
15	Jambi	5.2	10.5	36.6	32.9	2.8	88.1
16	Sumatera Selatan	10.8	27.3	79.8	67.2	12.6	197.7
17	Bengkulu	8.7	12.1	6.8	2.8	0.0	30.4
18	Lampung	34.9	4.3	8.1	27.8	6.2	81.2
31	D.K.I. Jakarta	0.3	0.0	0.0	0.0	0.0	0.3
32	Jawa Barat	15.6	0.0	0.0	0.0	0.0	15.6
33	Jawa Tengah	3.1	0.0	0.0	0.0	0.0	3.1
34	D.I. Yogyakarta	2.4	0.0	0.0	0.0	0.0	2.4
35	Jawa Timur	0.6	0.0	0.0	0.0	0.0	0.6
51	Bali	6.4	0.0	0.0	0.0	0.0	6.4
52	Nusa Tenggara Barat	22.0	0.0	0.0	0.0	0.0	22.0
53	Nusa Tenggara Timur	14.8	8.4	0.1	0.0	0.0	23.3
54	Timor Timur	1.3	5.4	7.3	7.0	0.0	20.9
61	Kalimantan Barat	1.8	2.8	22.1	21.0	6.3	53.9
62	Kalimantan Tengah	1.0	6.3	9.0	8.1	3.2	27.5
63	Kalimantan Selatan	6.3	14.9	16.0	8.1	3.2	48.5
64	Kalimantan Timur	6.3	2.8	3.5	3.5	0.7	16.8
71	Sulawesi Utara	16.7	11.4	5.7	0.4	0.0	34.1
72	Sulawesi Tengah	34.1	23.4	5.9	0.0	0.0	63.5
73	Sulawesi Selatan	11.7	4.8	0.3	0.0	0.0	16.8
74	Sulawesi Tenggara	20.9	8.3	13.5	14.7	4.2	61.6
81	Maluku	0.7	8.0	9.6	1.4	0.0	19.7
82	Irian Jaya	11.5	7.9	2.6	3.5	0.0	25.5
	Indonesia	326.4	258.2	303.3	207.7	39.2	1,134.8
	Zone1	89.5	99.6	76.3	9.5	0.0	274.9
	Zone2	59.6	54.2	131.4	130.7	21.6	397.4
	Zone3	28.2	0.0	0.0	0.0	0.0	28.2
	Zone4	15.4	26.8	50.6	40.6	13.4	146.8
	Zone5	83.4	47.9	25.4	15.1	4.2	175.9
	Zone6	50.3	29.8	19.6	11.9	0.0	111.6
	Indonesia	326.4	258.2	303.3	207.7	39.2	1,134.8

Source : Team's estimate

Table10.22 New Developed Area to be Identified

Unit:1000ha

Code	Province	Required New Construction Area A	Proposed New Construction Area through Inventory Survey B	Required Newly Developed Area A-B
11	D.I. Aceh	42.0	111.5	0.0
12	Sumatera Utara	79.9	176.1	0.0
13	Sumatera Barat	40.1	23.1	17.0
14	Riau	149.1	236.1	0.0
15	Jambi	117.9	18.9	99.0
16	Sumatera Selatan	267.0	69.0	198.0
17	Bengkulu	29.6	17.6	12.0
18	Lampung	66.4	25.4	41.0
53	Nusa Tenggara Timur	12.5	24.3	0.0
54	Timor Timur	26.8	10.8	16.0
61	Kalimantan Barat	75.1	12.1	63.0
62	Kalimantan Tengah	37.4	14.4	23.0
63	Kalimantan Selatan	60.3	37.3	23.0
64	Kalimantan Timur	14.6	3.6	11.0
71	Sulawesi Utara	24.1	24.1	0.0
72	Sulawesi Tengah	33.5	61.3	0.0
73	Sulawesi Selatan	91.8	263.9	0.0
74	Sulawesi Tenggara	60.1	29.1	31.0
81	Maluku	27.2	25.2	2.0
82	Irian Jaya	20.0	12.0	8.0
	Total	1,275.4	1,195.6	544.0

Source : Inventory Survey and Team's estimate

Table 10.23 Actual and Estimated Unit Costs by Sub-Program

Unit : Rp. 1000

No.	Sub-Program	Type	Unit Cost 1)			Equivalent Unit Cost in 1991/92 2)				Unit Cost in 1992/93 3)	
			1989/90	1990/91	1991/92	1989/90	1990/91	1991/92	Average		
1.	New Construction	New Construction	4,905	5,675	8,355	6,016	6,217	8,355	6,863	**7,500**	
		Extension	2,216	3,709	4,829	2,718	4,063	4,829	3,870	**4,200**	
		Groundwater Development	4,118	6,462	5,214	5,050	7,079	5,214	5,781	**6,300**	
2.	Rehabilitation	Rehabilitation	2,251	2,251	2,946	2,761	2,466	2,946	2,724	**3,000**	
3.	Special Maintenance		143	151	400	175	165	400	247	**300**	
4.	Handing over small projects		120	150	210	147	164	210	174	**200**	
5.	O&M	Surface Irrigation	11	14	18	14	16	18	16	**17**	
		Swamp Development	8	11	11	9	12	11	11	**12**	
6.	EOM	Surface Irrigation	24	25	29	29	27	29	28	**31**	
		Swamp Development	26	28	30	32	30	30	31	**34**	
7.	Swamp Development	Upgrading of Swamp	274	869	574	336	952	574	621	**2,000**	4)
8.	Land Development	Land Clearing/Leveling	327	441	586	401	483	586	490	**500**	
9.	Village Irrigation									**500**	5)

Note: 1): Calculated based on the actual expenditures in Mid-Term Review of Repelita V, DGWRD, MPW
2): Estimated unit cost using the wholesale price index of construction materials for Public Works in Agricultu
in Indikator Ekonomi December 1992.(159 for 1989, 178 for 1990 and 195 for 1991 as 100 for 1983)
3): Estimated unit costs for 1992/93 using the annual inflation ratio of 9% to the costs in 1991/9
4): Estimated based on the information from BPP and Directorate of Swamp. Reclamation cost is also include
5): Estimated based on the information from Directorate of Planning and Programmir

Table 10.24 Estimated Development Area and Construction Cost (New Construction)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	0	0	30	223	12	92	0	0	0	0	42	315
12	Sumatera Utara	8	63	48	356	28	210	0	0	0	0	84	629
13	Sumatera Barat	0	0	15	111	11	79	14	105	0	0	39	294
14	Riau	0	0	92	690	56	423	0	0	0	0	148	1,113
15	Jambi	0	0	13	100	52	392	48	359	4	32	118	884
16	Sumatera Selatan	0	0	37	280	113	849	97	729	19	144	267	2,003
17	Bengkulu	0	0	15	113	10	76	4	30	0	0	29	219
18	Lampung	0	0	5	37	11	81	40	303	10	73	66	494
	Sumatera	8	63	255	1,910	294	2,202	204	1,526	33	250	793	5,951
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	1	4	0	0	0	0	0	0	0	0	1	4
33	Jawa Tengah	0	0	0	0	0	0	0	0	0	0	0	0
34	D.I.Jogyakarta	0	0	0	0	0	0	0	0	0	0	0	0
35	Jawa Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Jawa	1	4	0	0	0	0	0	0	0	0	1	4
51	Bali	0	0	0	0	0	0	0	0	0	0	0	0
52	Nusa Tenggara Barat	1	9	0	0	0	0	0	0	0	0	1	9
53	Nusa Tenggara Timur	0	3	12	91	0	2	0	0	0	0	13	95
54	Timor Timur	1	7	6	44	10	78	10	75	0	0	27	204
	Bali/Nusa Tenggara	3	20	18	135	11	80	10	75	0	0	41	309
61	Kalimantan Barat	1	6	4	27	31	235	30	225	10	74	76	568
62	Kalimantan Tengah	0	0	8	61	13	99	12	86	5	35	37	281
63	Kalimantan Selatan	0	3	21	156	23	176	12	86	5	35	61	455
64	Kalimantan Timur	0	0	3	25	5	38	5	38	1	8	14	108
	Kalimantan	1	9	36	269	73	547	58	435	20	151	188	1,411
71	Sulawesi Utara	1	9	14	104	9	64	1	4	0	0	24	181
72	Sulawesi Tengah	8	60	23	176	9	68	0	0	0	0	41	304
73	Sulawesi Selatan	13	94	54	404	34	257	0	0	0	0	101	754
74	Sulawesi Tenggara	2	15	12	93	19	140	21	158	7	50	61	456
	Sulawesi	24	178	103	776	71	529	22	161	7	50	226	1,694
81	Maluku	0	0	12	86	14	103	2	15	0	0	27	204
82	Irian Jaya	0	0	11	85	4	28	5	38	0	0	20	150
	Maluku/Irian Jaya	0	0	23	171	17	131	7	53	0	0	47	354
	Indonesia	36	273	435	3,261	465	3,489	300	2,250	60	450	1,296	9,722

Source : JICA FIDP Team's estimate

Table 10.25 Estimated Development Area and Construction Cost (Extension)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	39	164	4	17	0	0	0	0	0	0	43	181
12	Sumatera Utara	2	7	0	0	0	0	0	0	0	0	2	7
13	Sumatera Barat	5	21	0	0	0	0	0	0	0	0	5	21
14	Riau	0	0	0	0	0	0	0	0	0	0	0	0
15	Jambi	13	55	0	0	0	0	0	0	0	0	13	55
16	Sumatera Selatan	0	0	0	0	0	0	0	0	0	0	0	0
17	Bengkulu	0	0	0	0	0	0	0	0	0	0	0	0
18	Lampung	0	0	0	0	0	0	0	0	0	0	0	0
	Sumatera	59	247	4	17	0	0	0	0	0	0	63	264
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	3	10	0	0	0	0	0	0	0	0	3	10
33	Jawa Tengah	0	1	0	0	0	0	0	0	0	0	0	1
34	D.I.Jogyakarta	0	1	0	0	0	0	0	0	0	0	0	1
35	Jawa Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Jawa	3	13	0	0	0	0	0	0	0	0	3	13
51	Bali	0	0	0	0	0	0	0	0	0	0	0	0
52	Nusa Tenggara Barat	6	26	0	0	0	0	0	0	0	0	6	26
53	Nusa Tenggara Timur	0	0	0	0	0	0	0	0	0	0	0	0
54	Timor Timur	0	1	0	0	0	0	0	0	0	0	0	1
	Bali/Nusa Tenggara	7	28	0	0	0	0	0	0	0	0	7	28
61	Kalimantan Barat	1	5	0	0	0	0	0	0	0	0	1	5
62	Kalimantan Tengah	0	1	0	0	0	0	0	0	0	0	0	1
63	Kalimantan Selatan	0	1	0	0	0	0	0	0	0	0	0	1
64	Kalimantan Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Kalimantan	2	7	0	0	0	0	0	0	0	0	2	7
71	Sulawesi Utara	8	32	0	0	0	0	0	0	0	0	8	32
72	Sulawesi Tengah	11	45	4	18	0	0	0	0	0	0	15	64
73	Sulawesi Selatan	0	1	3	11	0	0	0	0	0	0	3	12
74	Sulawesi Tenggara	0	2	0	0	0	0	0	0	0	0	0	2
	Sulawesi	19	80	7	29	0	0	0	0	0	0	26	109
81	Maluku	0	0	0	0	0	0	0	0	0	0	0	0
82	Irian Jaya	5	21	0	0	0	0	0	0	0	0	5	21
	Maluku/Irian Jaya	5	21	0	0	0	0	0	0	0	0	5	21
	Indonesia	94	395	11	46	0	0	0	0	0	0	105	441

Source : JICA FIDP Team's estimate

Table 10.26 Estimated Development Area and Construction Cost (Rehabilitation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	6	19	0	0	0	0	0	0	0	0	6	19
12	Sumatera Utara	60	179	0	0	0	0	0	0	0	0	60	179
13	Sumatera Barat	27	81	0	0	0	0	0	0	0	0	27	81
14	Riau	1	3	0	0	0	0	0	0	0	0	1	3
15	Jambi	2	6	0	0	0	0	0	0	0	0	2	6
16	Sumatera Selatan	1	3	0	0	0	0	0	0	0	0	1	3
17	Bengkulu	12	37	0	0	0	0	0	0	0	0	12	37
18	Lampung	34	102	0	0	0	0	0	0	0	0	34	102
	Sumatera	143	430	0	0	0	0	0	0	0	0	143	430
31	D.K.I.Jakarta	6	17	0	0	0	0	0	0	0	0	6	17
32	Jawa Barat	8	23	0	0	0	0	0	0	0	0	8	23
33	Jawa Tengah	17	51	0	0	0	0	0	0	0	0	17	51
34	D.I.Jogyakarta	5	16	0	0	0	0	0	0	0	0	5	16
35	Jawa Timur	157	471	0	0	0	0	0	0	0	0	157	471
	Jawa	193	578	0	0	0	0	0	0	0	0	193	578
51	Bali	16	49	0	0	0	0	0	0	0	0	16	49
52	Nusa Tenggara Barat	1	4	0	0	0	0	0	0	0	0	1	4
53	Nusa Tenggara Timur	10	31	0	0	0	0	0	0	0	0	10	31
54	Timor Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Bali/Nusa Tenggara	28	83	0	0	0	0	0	0	0	0	28	83
61	Kalimantan Barat	0	0	0	0	0	0	0	0	0	0	0	0
62	Kalimantan Tengah	0	1	0	0	0	0	0	0	0	0	0	1
63	Kalimantan Selatan	0	0	0	0	0	0	0	0	0	0	0	0
64	Kalimantan Timur	0	1	0	0	0	0	0	0	0	0	0	1
	Kalimantan	1	2	0	0	0	0	0	0	0	0	1	2
71	Sulawesi Utara	4	12	0	0	0	0	0	0	0	0	4	12
72	Sulawesi Tengah	20	60	0	0	0	0	0	0	0	0	20	60
73	Sulawesi Selatan	15	46	0	0	0	0	0	0	0	0	15	46
74	Sulawesi Tenggara	2	5	0	0	0	0	0	0	0	0	2	5
	Sulawesi	41	123	0	0	0	0	0	0	0	0	41	123
81	Maluku	1	3	0	0	0	0	0	0	0	0	1	3
82	Irian Jaya	1	2	0	0	0	0	0	0	0	0	1	2
	Maluku/Irian Jaya	2	5	0	0	0	0	0	0	0	0	2	5
	Indonesia	407	1,221	0	0	0	0	0	0	0	0	407	1,221

Source : JICA FIDP Team's estimate

Table 10.27 Estimated Development Area and Construction Cost (Groundwater)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	1	8	2	13	2	13	1	6	1	6	7	45
12	Sumatera Utara	1	6	1	6	2	13	2	13	2	13	8	50
13	Sumatera Barat	1	7	1	6	2	13	2	13	2	13	8	51
14	Riau	0	0	0	0	0	0	0	0	0	0	0	0
15	Jambi	0	0	0	0	0	0	0	0	0	0	0	0
16	Sumatera Selatan	0	0	0	0	0	0	0	0	0	0	0	0
17	Bengkulu	0	0	0	0	0	0	0	0	0	0	0	0
18	Lampung	2	13	1	6	0	0	0	0	0	0	3	19
	Sumatera	5	33	5	32	6	38	5	32	5	32	26	165
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	2	13	3	19	3	19	3	19	3	19	14	89
33	Jawa Tengah	15	94	15	95	9	57	0	0	0	0	39	245
34	D.I.Jogyakarta	1	6	1	6	1	6	0	0	0	0	3	19
35	Jawa Timur	8	50	9	57	9	57	9	57	10	63	45	284
	Jawa	26	164	28	176	22	139	12	76	13	82	101	636
51	Bali	1	9	2	13	2	13	2	13	3	19	10	65
52	Nusa Tenggara Barat	3	19	0	0	0	0	0	0	0	0	3	19
53	Nusa Tenggara Timur	2	10	1	6	1	6	1	6	1	6	6	35
54	Timor Timur	0	2	0	0	1	6	1	6	1	6	3	21
	Bali/Nusa Tenggara	6	39	3	19	4	25	4	25	5	32	22	139
61	Kalimantan Barat	0	0	0	0	0	0	0	0	0	0	0	0
62	Kalimantan Tengah	0	0	0	0	0	0	0	0	0	0	0	0
63	Kalimantan Selatan	0	0	0	0	0	0	0	0	0	0	0	0
64	Kalimantan Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Kalimantan	0	0	0	0	0	0	0	0	0	0	0	0
71	Sulawesi Utara	1	8	1	6	1	6	1	6	1	6	5	33
72	Sulawesi Tengah	2	11	2	13	2	13	2	13	0	0	8	49
73	Sulawesi Selatan	3	16	3	19	3	19	2	13	0	0	11	66
74	Sulawesi Tenggara	0	2	1	6	1	6	1	6	1	6	4	27
	Sulawesi	6	36	7	44	7	44	6	38	2	13	28	174
81	Maluku	0	0	0	0	0	0	0	0	1	6	1	7
82	Irian Jaya	0	1	0	0	0	0	0	0	1	6	1	7
	Maluku/Irian Jaya	0	1	0	0	0	0	0	0	2	13	2	14
	Indonesia	43	272	43	271	39	246	27	170	27	170	179	1,129

Source : JICA FIDP Team's estimate

Table 10.28 Estimated Development Area and Construction Cost (O/M, Surface Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	652	11	187	3	0	0	0	0	0	0	838	15
12	Sumatera Utara	523	9	141	2	0	0	0	0	0	0	663	11
13	Sumatera Barat	469	8	121	2	0	0	0	0	0	0	590	10
14	Riau	84	1	31	1	0	0	0	0	0	0	115	2
15	Jambi	91	2	27	1	0	0	0	0	0	0	118	2
16	Sumatera Selatan	164	3	49	1	0	0	0	0	0	0	213	4
17	Bengkulu	126	2	33	1	0	0	0	0	0	0	159	3
18	Lampung	382	7	102	2	0	0	0	0	0	0	484	8
	Sumatera	2,490	43	691	12	0	0	0	0	0	0	3,181	55
31	D.K.I.Jakarta	24	0	6	0	0	0	0	0	0	0	30	1
32	Jawa Barat	1,529	27	404	7	0	0	0	0	0	0	1,933	34
33	Jawa Tengah	1,384	24	362	6	0	0	0	0	0	0	1,745	30
34	D.I.Jogyakarta	55	1	14	0	0	0	0	0	0	0	68	1
35	Jawa Timur	1,586	27	409	7	0	0	0	0	0	0	1,994	35
	Jawa	4,577	79	1,194	21	0	0	0	0	0	0	5,771	100
51	Bali	151	3	34	1	0	0	0	0	0	0	184	3
52	Nusa Tenggara Barat	405	7	106	2	0	0	0	0	0	0	511	9
53	Nusa Tenggara Timur	127	2	34	1	0	0	0	0	0	0	161	3
54	Timor Timur	24	0	8	0	0	0	0	0	0	0	32	1
	Bali/Nusa Tenggara	707	12	182	3	0	0	0	0	0	0	888	15
61	Kalimantan Barat	37	1	9	0	0	0	0	0	0	0	47	1
62	Kalimantan Tengah	13	0	3	0	0	0	0	0	0	0	16	0
63	Kalimantan Selatan	86	2	25	0	0	0	0	0	0	0	110	2
64	Kalimantan Timur	39	1	10	0	0	0	0	0	0	0	48	1
	Kalimantan	174	3	47	1	0	0	0	0	0	0	221	4
71	Sulawesi Utara	163	3	50	1	0	0	0	0	0	0	213	4
72	Sulawesi Tengah	312	5	90	2	0	0	0	0	0	0	402	7
73	Sulawesi Selatan	621	11	181	3	0	0	0	0	0	0	802	14
74	Sulawesi Tenggara	106	2	32	1	0	0	0	0	0	0	138	2
	Sulawesi	1,203	21	352	6	0	0	0	0	0	0	1,555	27
81	Maluku	32	1	9	0	0	0	0	0	0	0	41	1
82	Irian Jaya	42	1	16	0	0	0	0	0	0	0	58	1
	Maluku/Irian Jaya	74	1	25	1	0	0	0	0	0	0	99	2
	Indonesia	9,225	159	2,491	43	0	0	0	0	0	0	11,716	203

Source : JICA FIDP Team's estimate

Remarks : Cumulative area, in which the works will be carried out, in each Repelita is shown.

Table 10.29 Estimated Development Area and Construction Cost (O/M, Swamp Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	8	0	3	0	0	0	0	0	0	0	11	0
12	Sumatera Utara	170	2	67	1	0	0	0	0	0	0	237	3
13	Sumatera Barat	0	0	0	0	0	0	0	0	0	0	0	0
14	Riau	642	8	250	3	0	0	0	0	0	0	892	10
15	Jambi	94	1	22	0	0	0	0	0	0	0	116	1
16	Sumatera Selatan	158	2	20	0	0	0	0	0	0	0	179	2
17	Bengkulu	8	0	0	0	0	0	0	0	0	0	8	0
18	Lampung	0	0	0	0	0	0	0	0	0	0	0	0
	Sumatera	1,080	13	362	4	0	0	0	0	0	0	1,443	17
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	0	0	0	0	0	0	0	0	0	0	0	0
33	Jawa Tengah	0	0	0	0	0	0	0	0	0	0	0	0
34	D.I.Jogyakarta	0	0	0	0	0	0	0	0	0	0	0	0
35	Jawa Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Jawa	0	0	0	0	0	0	0	0	0	0	0	0
51	Bali	0	0	0	0	0	0	0	0	0	0	0	0
52	Nusa Tenggara Barat	0	0	0	0	0	0	0	0	0	0	0	0
53	Nusa Tenggara Timur	0	0	0	0	0	0	0	0	0	0	0	0
54	Timor Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Bali/Nusa Tenggara	0	0	0	0	0	0	0	0	0	0	0	0
61	Kalimantan Barat	233	3	68	1	0	0	0	0	0	0	301	4
62	Kalimantan Tengah	847	10	328	4	0	0	0	0	0	0	1,175	14
63	Kalimantan Selatan	298	4	119	1	0	0	0	0	0	0	417	5
64	Kalimantan Timur	17	0	5	0	0	0	0	0	0	0	21	0
	Kalimantan	1,394	16	519	6	0	0	0	0	0	0	1,913	22
71	Sulawesi Utara	2	0	1	0	0	0	0	0	0	0	2	0
72	Sulawesi Tengah	19	0	8	0	0	0	0	0	0	0	27	0
73	Sulawesi Selatan	829	10	331	4	0	0	0	0	0	0	1,161	14
74	Sulawesi Tenggara	28	0	10	0	0	0	0	0	0	0	39	0
	Sulawesi	878	10	350	4	0	0	0	0	0	0	1,228	14
81	Maluku	0	0	0	0	0	0	0	0	0	0	0	0
82	Irian Jaya	3	0	0	0	0	0	0	0	0	0	3	0
	Maluku/Irian Jaya	3	0	0	0	0	0	0	0	0	0	3	0
	Indonesia	3,355	39	1,232	14	0	0	0	0	0	0	4,587	54

Source : JICA FIDP Team's estimate

Remarks : Cumulative area, in which the works will be carried out, in each Repelita is shown.

Table 10.30 Estimated Development Area and Construction Cost (EOM, Surface Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	786	24	1,315	41	1,542	48	1,469	46	1,465	45	6,578	204
12	Sumatera Utara	619	19	977	30	1,066	33	927	29	917	28	4,506	140
13	Sumatera Barat	557	17	836	26	909	28	883	27	904	28	4,090	127
14	Riau	100	3	332	10	846	26	867	27	866	27	3,010	93
15	Jambi	112	4	197	6	403	13	638	20	750	23	2,100	65
16	Sumatera Selatan	196	6	379	12	853	27	1,345	42	1,622	50	4,395	136
17	Bengkulu	150	5	242	8	304	9	310	10	310	10	1,314	41
18	Lampung	455	14	711	22	817	25	934	29	1,063	33	3,981	123
	Sumatera	2,975	92	4,989	155	6,740	209	7,372	229	7,897	245	29,972	929
31	D.K.I.Jakarta	29	1	41	1	41	1	37	1	36	1	184	6
32	Jawa Barat	1,821	57	2,768	86	2,977	92	2,828	88	2,820	87	13,214	410
33	Jawa Tengah	1,647	51	2,468	77	2,603	81	2,431	75	2,422	75	11,571	359
34	D.I.Jogyakarta	65	2	92	3	91	3	79	3	79	2	406	13
35	Jawa Timur	1,886	59	2,769	86	2,834	88	2,573	80	2,560	79	12,622	391
	Jawa	5,447	169	8,137	252	8,546	265	7,948	247	7,917	245	37,996	1,178
51	Bali	178	6	212	7	147	5	72	2	69	2	678	21
52	Nusa Tenggara Barat	483	15	721	22	753	23	696	22	693	22	3,345	104
53	Nusa Tenggara Timur	150	5	238	7	247	8	209	7	207	6	1,051	33
54	Timor Timur	29	1	62	2	107	3	158	5	178	6	534	17
	Bali/Nusa Tenggara	839	26	1,234	38	1,253	39	1,136	35	1,147	36	5,608	174
61	Kalimantan Barat	44	1	63	2	152	5	284	9	389	12	933	29
62	Kalimantan Tengah	15	1	32	1	104	3	158	5	202	6	512	16
63	Kalimantan Selatan	102	3	193	6	316	10	372	12	414	13	1,396	43
64	Kalimantan Timur	46	1	66	2	78	2	87	3	101	3	378	12
	Kalimantan	207	6	354	11	650	20	902	28	1,107	34	3,219	100
71	Sulawesi Utara	197	6	352	11	424	13	405	13	403	13	1,781	55
72	Sulawesi Tengah	375	12	644	20	759	24	710	22	707	22	3,194	99
73	Sulawesi Selatan	745	23	1,316	41	1,733	54	1,705	53	1,703	53	7,202	223
74	Sulawesi Tenggara	127	4	229	7	306	10	399	12	469	15	1,529	47
	Sulawesi	1,443	45	2,541	79	3,222	100	3,219	100	3,281	102	13,706	425
81	Maluku	38	1	79	2	145	5	189	6	189	6	640	20
82	Irian Jaya	52	2	123	4	164	5	184	6	194	6	717	22
	Maluku/Irian Jaya	90	3	202	6	309	10	373	12	383	12	1,357	42
	Indonesia	11,000	341	17,457	541	20,719	642	20,949	650	21,732	674	91,857	2,848

Source : JICA FIDP Team's estimate

Remarks : Cumulative area, in which the works will be carried out, in each Repelita is shown.

Table 10.31 Estimated Development Area and Construction Cost (EOM, Swamp Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	8	0	12	0	15	1	15	1	15	1	66	2
12	Sumatera Utara	113	4	216	7	283	10	283	10	283	10	1,177	40
13	Sumatera Barat	47	2	47	2	47	2	47	2	47	2	236	8
14	Riau	77	3	470	16	719	24	719	24	719	24	2,705	91
15	Jambi	92	3	164	6	186	6	186	6	186	6	814	27
16	Sumatera Selatan	1,046	35	1,183	40	1,204	40	1,204	40	1,204	40	5,840	196
17	Bengkulu	26	1	34	1	34	1	34	1	34	1	160	5
18	Lampung	124	4	124	4	124	4	124	4	124	4	619	21
	Sumatera	1,532	52	2,250	76	2,612	88	2,612	88	2,612	88	11,617	390
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	0	0	0	0	0	0	0	0	0	0	0	0
33	Jawa Tengah	0	0	0	0	0	0	0	0	0	0	0	0
34	D.I.Jogyakarta	0	0	0	0	0	0	0	0	0	0	0	0
35	Jawa Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Jawa	0	0	0	0	0	0	0	0	0	0	0	0
51	Bali	0	0	0	0	0	0	0	0	0	0	0	0
52	Nusa Tenggara Barat	0	0	0	0	0	0	0	0	0	0	0	0
53	Nusa Tenggara Timur	0	0	0	0	0	0	0	0	0	0	0	0
54	Timor Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Bali/Nusa Tenggara	0	0	0	0	0	0	0	0	0	0	0	0
61	Kalimantan Barat	99	3	264	9	332	11	332	11	332	11	1,358	46
62	Kalimantan Tengah	69	2	588	20	916	31	916	31	916	31	3,405	115
63	Kalimantan Selatan	162	5	340	11	459	15	459	15	459	15	1,879	63
64	Kalimantan Timur	22	1	34	1	38	1	38	1	38	1	171	6
	Kalimantan	352	12	1,226	41	1,745	59	1,745	59	1,745	59	6,813	229
71	Sulawesi Utara	0	0	1	0	2	0	2	0	2	0	6	0
72	Sulawesi Tengah	0	0	12	0	19	1	19	1	19	1	69	2
73	Sulawesi Selatan	14	1	512	17	843	28	843	28	843	28	3,054	103
74	Sulawesi Tenggara	18	1	36	1	46	2	46	2	46	2	192	6
	Sulawesi	32	1	560	19	910	31	910	31	910	31	3,321	111
81	Maluku	0	0	0	0	0	0	0	0	0	0	0	0
82	Irian Jaya	27	1	30	1	30	1	30	1	30	1	147	5
	Maluku/Irian Jaya	27	1	30	1	30	1	30	1	30	1	147	5
	Indonesia	1,942	65	4,065	137	5,297	178	5,297	178	5,297	178	21,898	735

Source : JICA FIDP Team's estimate

Remarks : Cumulative area, in which the works will be carried out, in each Repelita is shown.

Table 10.32 Estimated Development Area and Construction Cost (Handing over Small Scheme)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	12	2	21	4	21	4	8	2	0	0	62	12
12	Sumatera Utara	28	6	47	9	47	9	19	4	0	0	141	28
13	Sumatera Barat	20	4	24	5	24	5	10	2	0	0	77	16
14	Riau	3	1	5	1	5	1	2	0	0	0	14	3
15	Jambi	3	1	5	1	5	1	2	0	0	0	15	3
16	Sumatera Selatan	3	1	5	1	5	1	2	0	0	0	15	3
17	Bengkulu	5	1	9	2	9	2	3	1	0	0	25	5
18	Lampung	5	1	8	2	8	2	3	1	0	0	23	5
	Sumatera	78	16	122	24	122	24	49	10	0	0	371	74
31	D.K.I.Jakarta	1	0	1	0	1	0	1	0	0	0	4	1
32	Jawa Barat	31	6	39	8	39	8	16	3	0	0	125	25
33	Jawa Tengah	32	6	45	9	45	9	18	4	0	0	141	28
34	D.I.Jogyakarta	3	1	3	1	3	1	1	0	0	0	10	2
35	Jawa Timur	43	9	69	14	69	14	28	6	0	0	208	42
	Jawa	110	22	157	31	157	31	63	13	0	0	487	97
51	Bali	12	2	20	4	20	4	8	2	0	0	59	12
52	Nusa Tenggara Barat	10	2	15	3	15	3	6	1	0	0	46	9
53	Nusa Tenggara Timur	6	1	10	2	10	2	4	1	0	0	30	6
54	Timor Timur	0	0	1	0	1	0	0	0	0	0	2	0
	Bali/Nusa Tenggara	28	6	45	9	45	9	18	4	0	0	136	27
61	Kalimantan Barat	3	1	5	1	5	1	2	0	0	0	15	3
62	Kalimantan Tengah	1	0	1	0	1	0	0	0	0	0	2	1
63	Kalimantan Selatan	3	1	6	1	6	1	2	0	0	0	17	3
64	Kalimantan Timur	3	1	4	1	4	1	2	0	0	0	13	2
	Kalimantan	9	2	15	3	15	3	6	1	0	0	46	9
71	Sulawesi Utara	5	1	8	2	8	2	3	1	0	0	23	5
72	Sulawesi Tengah	8	2	14	3	14	3	6	1	0	0	42	8
73	Sulawesi Selatan	7	1	11	2	11	2	5	1	0	0	34	7
74	Sulawesi Tenggara	3	1	5	1	5	1	2	0	0	0	14	3
	Sulawesi	23	5	38	8	38	8	15	3	0	0	113	23
81	Maluku	1	0	1	0	1	0	1	0	0	0	4	1
82	Irian Jaya	1	0	1	0	1	0	1	0	0	0	4	1
	Maluku/Irian Jaya	1	0	3	1	3	1	1	0	0	0	7	1
	Indonesia	250	50	380	76	380	76	152	30	0	0	1,161	232

Source : JICA FIDP Team's estimate

Table 10.33 Estimated Development Area and Construction Cost (Upgrading of Swamp Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	8	15	0	0	0	0	0	0	0	0	8	15
12	Sumatera Utara	10	20	0	0	0	0	0	0	0	0	10	20
13	Sumatera Barat	30	60	0	0	0	0	0	0	0	0	30	60
14	Riau	70	140	0	0	0	0	0	0	0	0	70	140
15	Jambi	30	60	0	0	0	0	0	0	0	0	30	60
16	Sumatera Selatan	90	180	0	0	0	0	0	0	0	0	90	180
17	Bengkulu	15	30	0	0	0	0	0	0	0	0	15	30
18	Lampung	43	85	0	0	0	0	0	0	0	0	43	85
	Sumatera	295	590	0	0	0	0	0	0	0	0	295	590
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	0	0	0	0	0	0	0	0	0	0	0	0
33	Jawa Tengah	0	0	0	0	0	0	0	0	0	0	0	0
34	D.I.Jogyakarta	0	0	0	0	0	0	0	0	0	0	0	0
35	Jawa Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Jawa	0	0	0	0	0	0	0	0	0	0	0	0
51	Bali	0	0	0	0	0	0	0	0	0	0	0	0
52	Nusa Tenggara Barat	0	0	0	0	0	0	0	0	0	0	0	0
53	Nusa Tenggara Timur	0	0	0	0	0	0	0	0	0	0	0	0
54	Timor Timur	0	0	0	0	0	0	0	0	0	0	0	0
	Bali/Nusa Tenggara	0	0	0	0	0	0	0	0	0	0	0	0
61	Kalimantan Barat	50	100	0	0	0	0	0	0	0	0	50	100
62	Kalimantan Tengah	75	150	0	0	0	0	0	0	0	0	75	150
63	Kalimantan Selatan	50	100	0	0	0	0	0	0	0	0	50	100
64	Kalimantan Timur	15	30	0	0	0	0	0	0	0	0	15	30
	Kalimantan	190	380	0	0	0	0	0	0	0	0	190	380
71	Sulawesi Utara	0	0	0	0	0	0	0	0	0	0	0	0
72	Sulawesi Tengah	5	10	0	0	0	0	0	0	0	0	5	10
73	Sulawesi Selatan	0	0	0	0	0	0	0	0	0	0	0	0
74	Sulawesi Tenggara	10	20	0	0	0	0	0	0	0	0	10	20
	Sulawesi	15	30	0	0	0	0	0	0	0	0	15	30
81	Maluku	0	0	0	0	0	0	0	0	0	0	0	0
82	Irian Jaya	20	40	0	0	0	0	0	0	0	0	20	40
	Maluku/Irian Jaya	20	40	0	0	0	0	0	0	0	0	20	40
	Indonesia	520	1,040	0	0	0	0	0	0	0	0	520	1,040

Source : JICA FIDP Team's estimate

Table 10.34 Estimated Development Area and Construction Cost (Village Irrigation)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	14	7	14	7	0	0	0	0	0	0	27	14
12	Sumatera Utara	24	12	24	12	0	0	0	0	0	0	48	24
13	Sumatera Barat	15	8	15	8	0	0	0	0	0	0	30	15
14	Riau	1	0	1	0	0	0	0	0	0	0	1	1
15	Jambi	6	3	6	3	0	0	0	0	0	0	11	6
16	Sumatera Selatan	19	9	19	9	0	0	0	0	0	0	37	19
17	Bengkulu	5	3	5	3	0	0	0	0	0	0	10	5
18	Lampung	12	6	12	6	0	0	0	0	0	0	23	12
	Sumatera	94	47	94	47	0	0	0	0	0	0	187	94
31	D.K.I.Jakarta	1	0	1	0	0	0	0	0	0	0	1	1
32	Jawa Barat	76	38	76	38	0	0	0	0	0	0	151	76
33	Jawa Tengah	8	4	8	4	0	0	0	0	0	0	16	8
34	D.I.Jogyakarta	5	2	5	2	0	0	0	0	0	0	9	5
35	Jawa Timur	11	5	11	5	0	0	0	0	0	0	21	11
	Jawa	99	50	99	50	0	0	0	0	0	0	198	99
51	Bali	6	3	6	3	0	0	0	0	0	0	11	6
52	Nusa Tenggara Barat	21	10	21	10	0	0	0	0	0	0	41	21
53	Nusa Tenggara Timur	13	7	13	7	0	0	0	0	0	0	26	13
54	Timor Timur	3	2	3	2	0	0	0	0	0	0	6	3
	Bali/Nusa Tenggara	42	21	42	21	0	0	0	0	0	0	84	42
61	Kalimantan Barat	4	2	4	2	0	0	0	0	0	0	7	4
62	Kalimantan Tengah	2	1	2	1	0	0	0	0	0	0	4	2
63	Kalimantan Selatan	4	2	4	2	0	0	0	0	0	0	7	4
64	Kalimantan Timur	4	2	4	2	0	0	0	0	0	0	7	4
	Kalimantan	13	6	13	6	0	0	0	0	0	0	25	13
71	Sulawesi Utara	4	2	4	2	0	0	0	0	0	0	7	4
72	Sulawesi Tengah	3	2	3	2	0	0	0	0	0	0	6	3
73	Sulawesi Selatan	38	19	38	19	0	0	0	0	0	0	75	38
74	Sulawesi Tenggara	3	2	3	2	0	0	0	0	0	0	6	3
	Sulawesi	47	24	47	24	0	0	0	0	0	0	94	47
81	Maluku	2	1	2	1	0	0	0	0	0	0	4	2
82	Irian Jaya	0	0	0	0	0	0	0	0	0	0	0	0
	Maluku/Irian Jaya	2	1	2	1	0	0	0	0	0	0	4	2
	Indonesia	296	149	296	149	0	0	0	0	0	0	592	298

Source : JICA FIDP Team's estimate

Table 10.35 Estimated Development Area and Construction Cost (Land Development)

Unit : 1000 ha, Rp. Billion

Code	Province	Repelita VI		Repelita VII		Repelita VIII		Repelita IX		Repelita X		Total	
		Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost	Area	Cost
11	D.I.Aceh	16	8	21	11	7	4	0	0	0	0	44	22
12	Sumatera Utara	28	14	17	8	20	10	0	0	0	0	64	32
13	Sumatera Barat	36	18	14	7	8	4	10	5	0	0	67	34
14	Riau	11	5	48	24	41	21	0	0	0	0	100	50
15	Jambi	5	3	11	5	37	18	33	17	3	1	88	44
16	Sumatera Selatan	11	5	27	14	80	40	67	34	13	6	198	99
17	Bengkulu	9	4	12	6	7	3	3	1	0	0	30	15
18	Lampung	35	18	4	2	8	4	28	14	6	3	81	41
	Sumatera	149	75	154	77	208	104	140	70	22	11	672	336
31	D.K.I.Jakarta	0	0	0	0	0	0	0	0	0	0	0	0
32	Jawa Barat	16	8	0	0	0	0	0	0	0	0	16	8
33	Jawa Tengah	3	2	0	0	0	0	0	0	0	0	3	2
34	D.I.Jogyakarta	2	1	0	0	0	0	0	0	0	0	2	1
35	Jawa Timur	1	0	0	0	0	0	0	0	0	0	1	0
	Jawa	22	11	0	0	0	0	0	0	0	0	22	11
51	Bali	6	3	0	0	0	0	0	0	0	0	6	3
52	Nusa Tenggara Barat	22	11	0	0	0	0	0	0	0	0	22	11
53	Nusa Tenggara Timur	15	7	8	4	0	0	0	0	0	0	23	12
54	Timor Timur	1	1	5	3	7	4	7	4	0	0	21	10
	Bali/Nusa Tenggara	45	22	14	7	7	4	7	4	0	0	73	36
61	Kalimantan Barat	2	1	3	1	22	11	21	11	6	3	54	27
62	Kalimantan Tengah	1	1	6	3	9	5	8	4	3	2	28	14
63	Kalimantan Selatan	6	3	15	8	16	8	8	4	3	2	49	24
64	Kalimantan Timur	6	3	3	1	4	2	4	2	1	0	17	9
	Kalimantan	15	8	27	13	51	25	41	20	13	7	147	74
71	Sulawesi Utara	17	8	11	6	6	3	0	0	0	0	34	17
72	Sulawesi Tengah	34	17	23	12	6	3	0	0	0	0	63	32
73	Sulawesi Selatan	12	6	5	2	0	0	0	0	0	0	17	8
74	Sulawesi Tenggara	21	10	8	4	14	7	15	7	4	2	62	31
	Sulawesi	83	42	48	24	25	13	15	8	4	2	176	88
81	Maluku	1	0	8	4	10	5	1	1	0	0	20	10
82	Irian Jaya	12	6	8	4	3	1	4	2	0	0	26	13
	Maluku/Irian Jaya	12	6	16	8	12	6	5	3	0	0	45	23
	Indonesia	327	163	258	129	303	152	208	104	39	20	1,135	567

Source : JICA FIDP Team's estimate

Table 10.36 Estimated Area and Cost for irrigation development

Sub-Program	Actual and Proposed Area for Irrigation Development (1,000 ha						Estimated Cost for Irrigation Development (Billion Rp.					
	Pelita V 1989-1993	Repelita VI 1994-1998	Repelita VII 1999-2003	Repelita VIII 2004-2008	Repelita IX 2009-2013	Repelita X 2014-2018	Pelita v 1989-1993	Repelita VI 1994-1998	Repelita VII 1999-2003	Repelita VIII 2004-2008	Repelita IX 2009-2013	Repelita X 2014-2018
New Construction	134	36	435	465	300	60	974	273	3,261	3,489	2,250	450
Extension	339	94	11	0	0	0	1,529	395	46	0	0	0
Rehabilitation	413	407	0	0	0	0	1,256	1,221	0	0	0	0
Groundwater Development	32	43	43	39	27	27	172	272	271	246	170	170
Survey, Design,etc.							93	353	349	225	45	0
Special Maintenanc	775	-	-	-	-	-	249	-	-	-	-	-
O&M Surface Irrigatior	15,211	9,225	2,491	0	0	0	226	159	43	0	0	0
O&M Swamp	5,167	3,355	1,232	0	0	0	60	39	14	0	0	0
EOM Surface Irrigatior	6,903	11,000	17,457	20,720	20,949	21,732	209	341	541	642	650	674
EOM Swamp	903	1,942	4,065	5,297	5,297	5,297	29	65	137	178	178	178
Handing over Small Schemes	250	250	380	380	152	0	69	50	76	76	30	0
Swamp Development	475	520	0	0	0	0	496	1,040	0	0	0	0
Sub-Total							5,362	4,209	4,738	4,855	3,323	1,471
Land Development		327	258	303	208	39	0	163	129	152	104	20
Village Irrigatior		296	296	0	0	0	0	149	149	0	0	0
Total							5,362	4,521	5,016	5,007	3,427	1,491

Note: Costs for Pelita V is expressed at current price, and those for future Repelitas are expressed at 1992 constant pric
Source: Data for Pelita V is from Mid Term Review and others are estimated by FIDP Tear

Table 10.37 Summary of Operation and Maintenance Program

	Item		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
EOM	Surface Irrigation	a	1,800	2,000	2,200	2,400	2,600	2,900	3,200	3,500	3,800	4,057	4,112	4,150
	Swamp	b	316	361	396	425	444	567	690	813	936	1,059	1,059	1,059
	Sub total	c=a+b	2,116	2,361	2,596	2,825	3,044	3,467	3,890	4,313	4,736	5,116	5,171	5,209
OM	Surface Irrigation	d	2,290	2,072	1,853	1,620	1,390	1,059	755	469	208	0	0	0
	Swamp	e	743	698	664	634	616	493	370	246	123	0	0	0
	Sub total	f=d+e	3,033	2,770	2,517	2,254	2,006	1,552	1,125	715	331	0	0	0
Handing over (PIK)		g	147	196	248	299	349	425	501	577	653	729	805	881
Surface Irrigation (EOM +OM		h=a+d	4,090	4,072	4,053	4,020	3,990	3,959	3,955	3,969	4,008	4,057	4,112	4,150
Swamp (EOM + OM)		i=b+e	1,059	1,059	1,060	1,059	1,060	1,060	1,060	1,059	1,059	1,059	1,059	1,059
Total Area except PIK		j=c+f	5,149	5,131	5,113	5,079	5,050	5,019	5,015	5,028	5,067	5,116	5,171	5,209
Grand Total		k=j+g	5,296	5,327	5,361	5,378	5,399	5,444	5,516	5,605	5,720	5,845	5,976	6,090

	Item		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EOM	Surface Irrigation	a	4,128	4,116	4,177	4,237	4,291	4,329	4,351	4,351	4,351	4,351	4,351	4,351
	Swamp	b	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059
	Sub total	c=a+b	5,187	5,175	5,236	5,296	5,350	5,388	5,410	5,410	5,410	5,410	5,410	5,410
OM	Surface Irrigation	d	0	0	0	0	0	0	0	0	0	0	0	0
	Swamp	e	0	0	0	0	0	0	0	0	0	0	0	0
	Sub total	f=d+e	0	0	0	0	0	0	0	0	0	0	0	0
Handing over (PIK)		g	1,184	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260
Surface Irrigation (EOM +OM		h=a+d	4,128	4,116	4,177	4,237	4,291	4,329	4,351	4,351	4,351	4,351	4,351	4,351
Swamp (EOM + OM)		i=b+e	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059	1,059
Total Area except PIK		j=c+f	5,187	5,175	5,236	5,296	5,350	5,388	5,410	5,410	5,410	5,410	5,410	5,410
Grand Total		k=j+g	6,371	6,435	6,496	6,556	6,610	6,648	6,670	6,670	6,670	6,670	6,670	6,670

Source : JICA FIDP Team's estimate

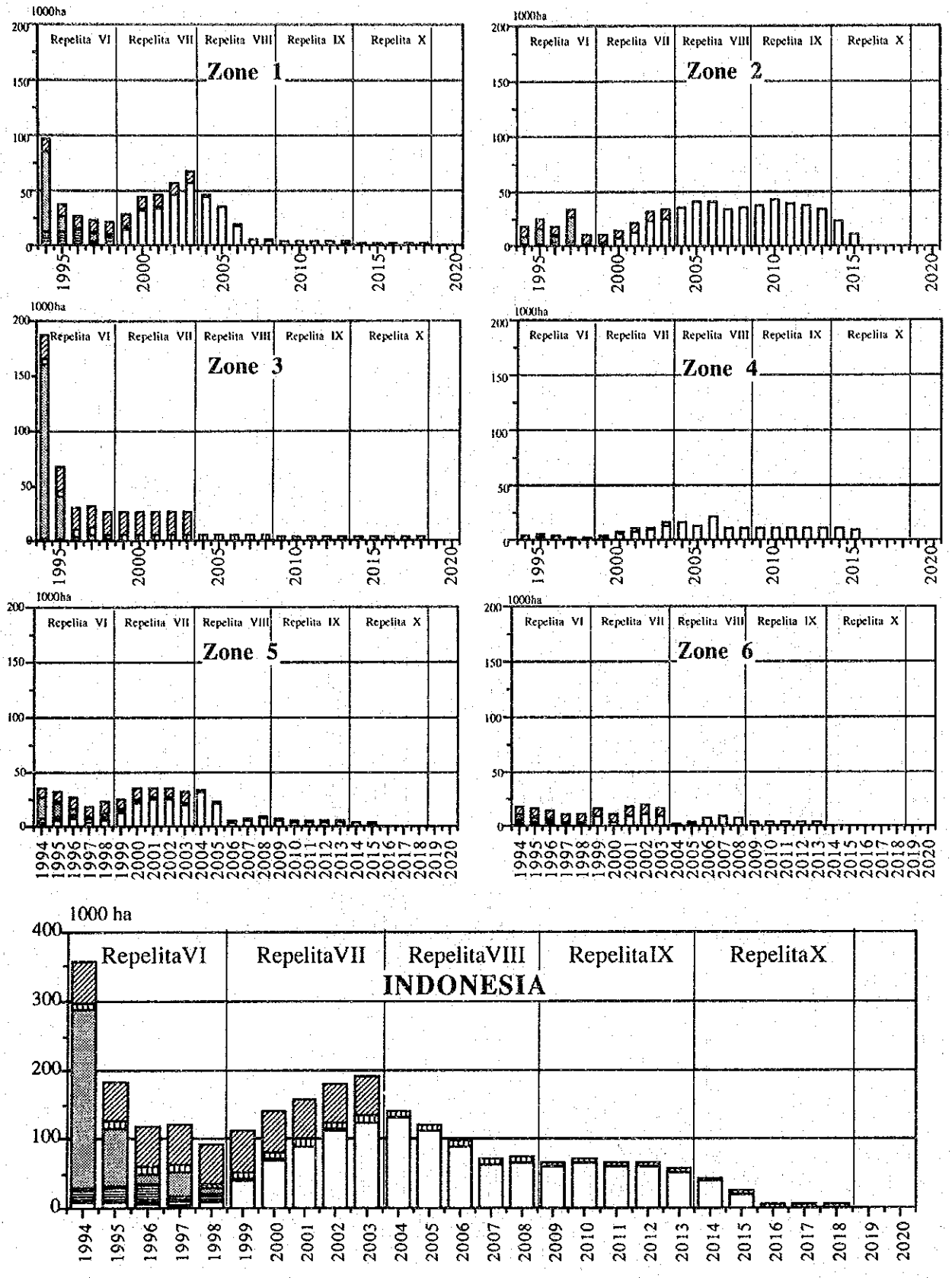

Figure 10.1 Annual Target Irrigation Development Area by Zone and Indonesia

MINISTRY OF PUBLIC WORKS
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
JAPAN INTERNATIONAL COOPERATION AGENCY

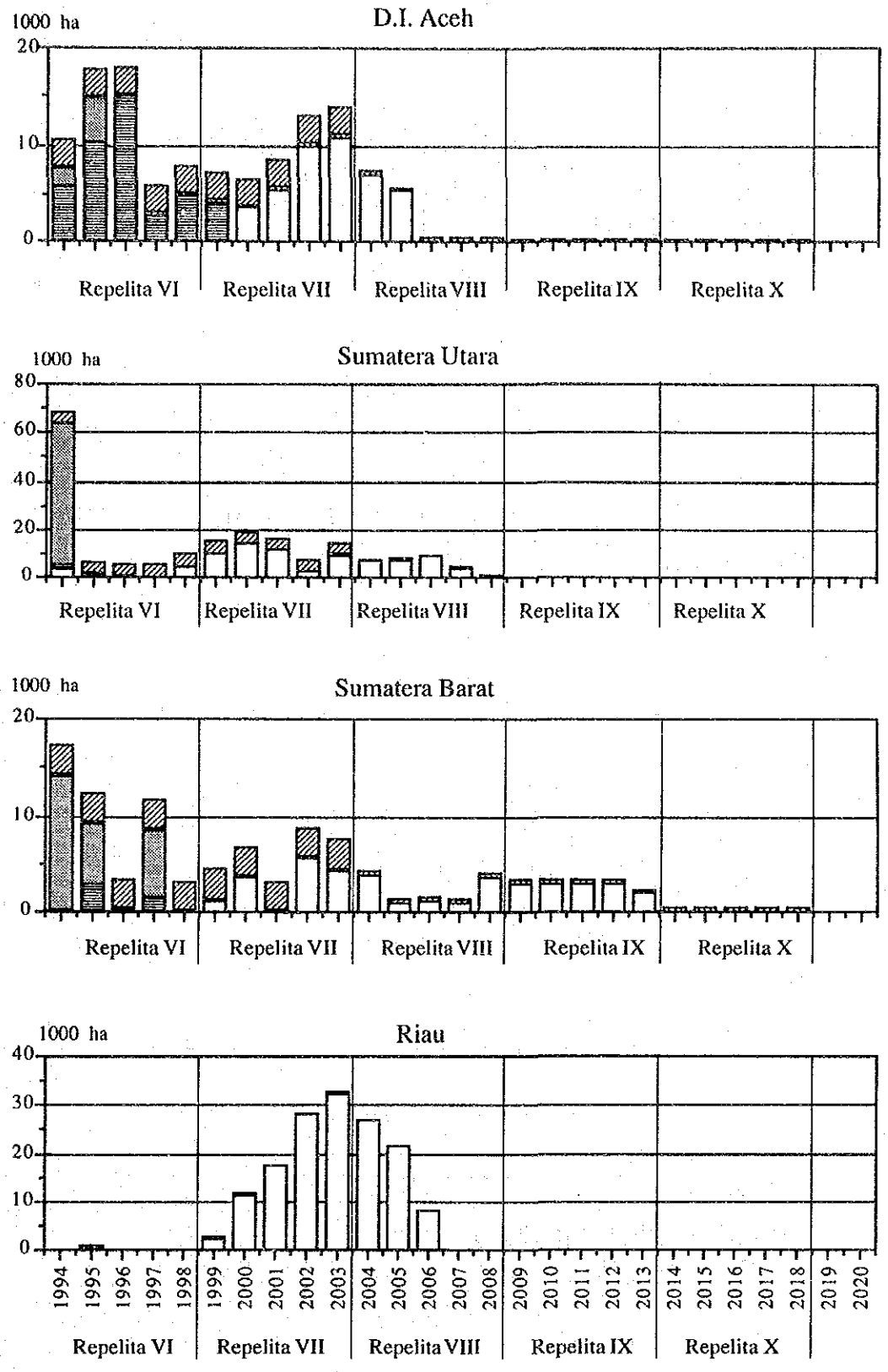

Figure 10.2 Annual Target Irrigation Development Area by Province for Zone 1

MINISTRY OF PUBLIC WORKS
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
JAPAN INTERNATIONAL COOPERATION AGENCY

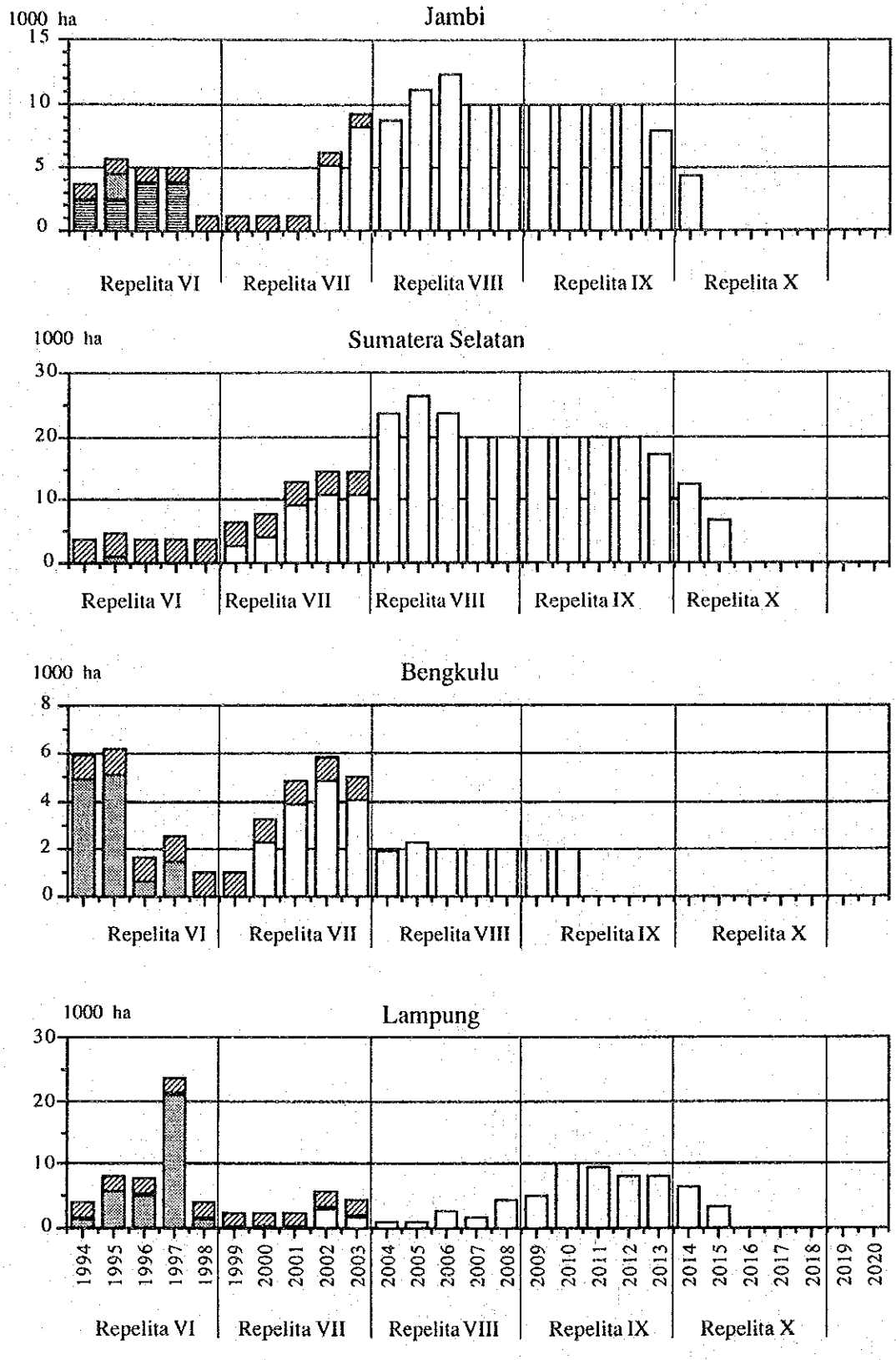

Figure 10.3 Annual Target Irrigation Development Area by Province for Zone 2

MINISTRY OF PUBLIC WORKS
FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
JAPAN INTERNATIONAL COOPERATION AGENCY

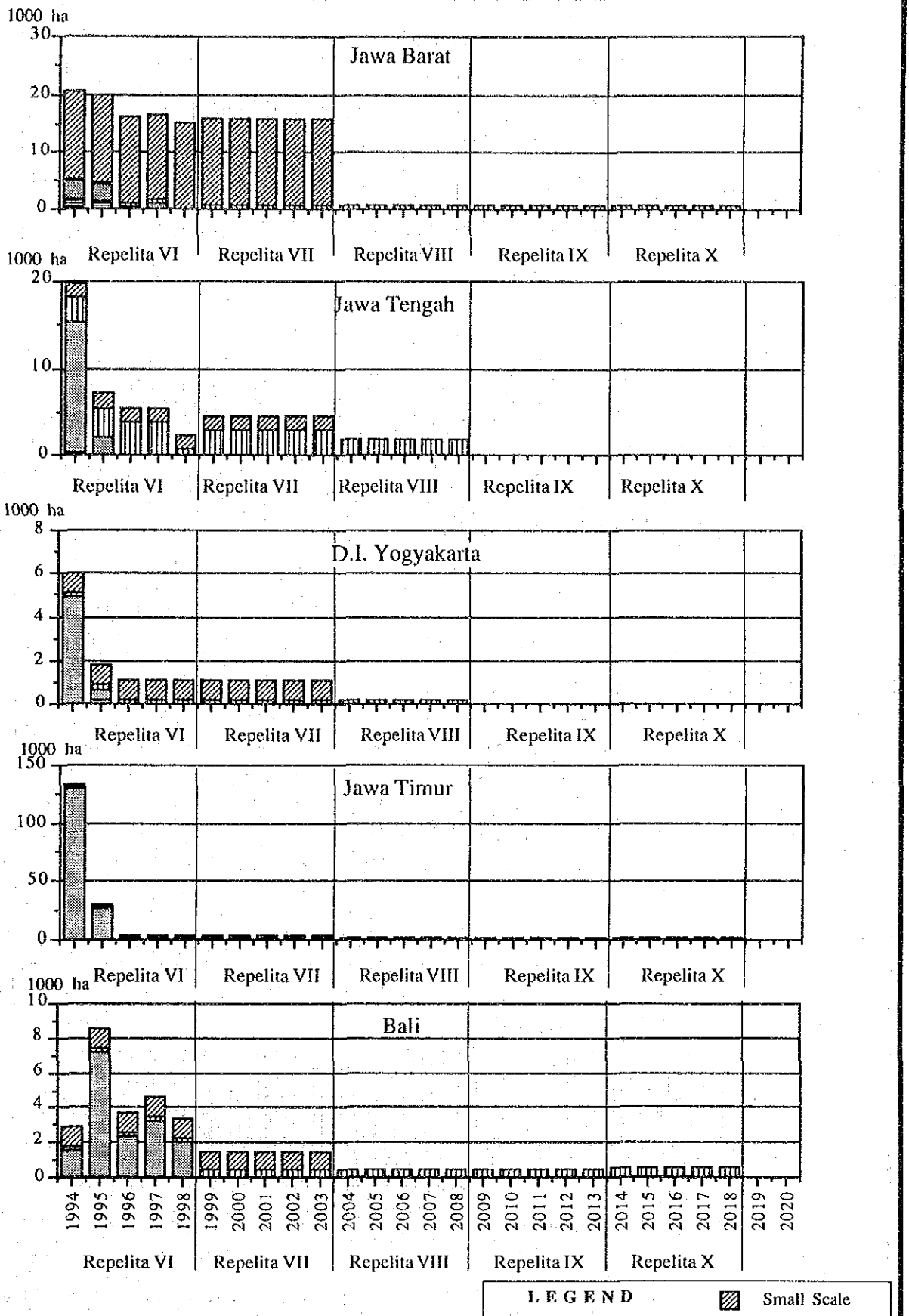

Figure 10.4 Annual Target Irrigation Development Area by Province for Zone 3

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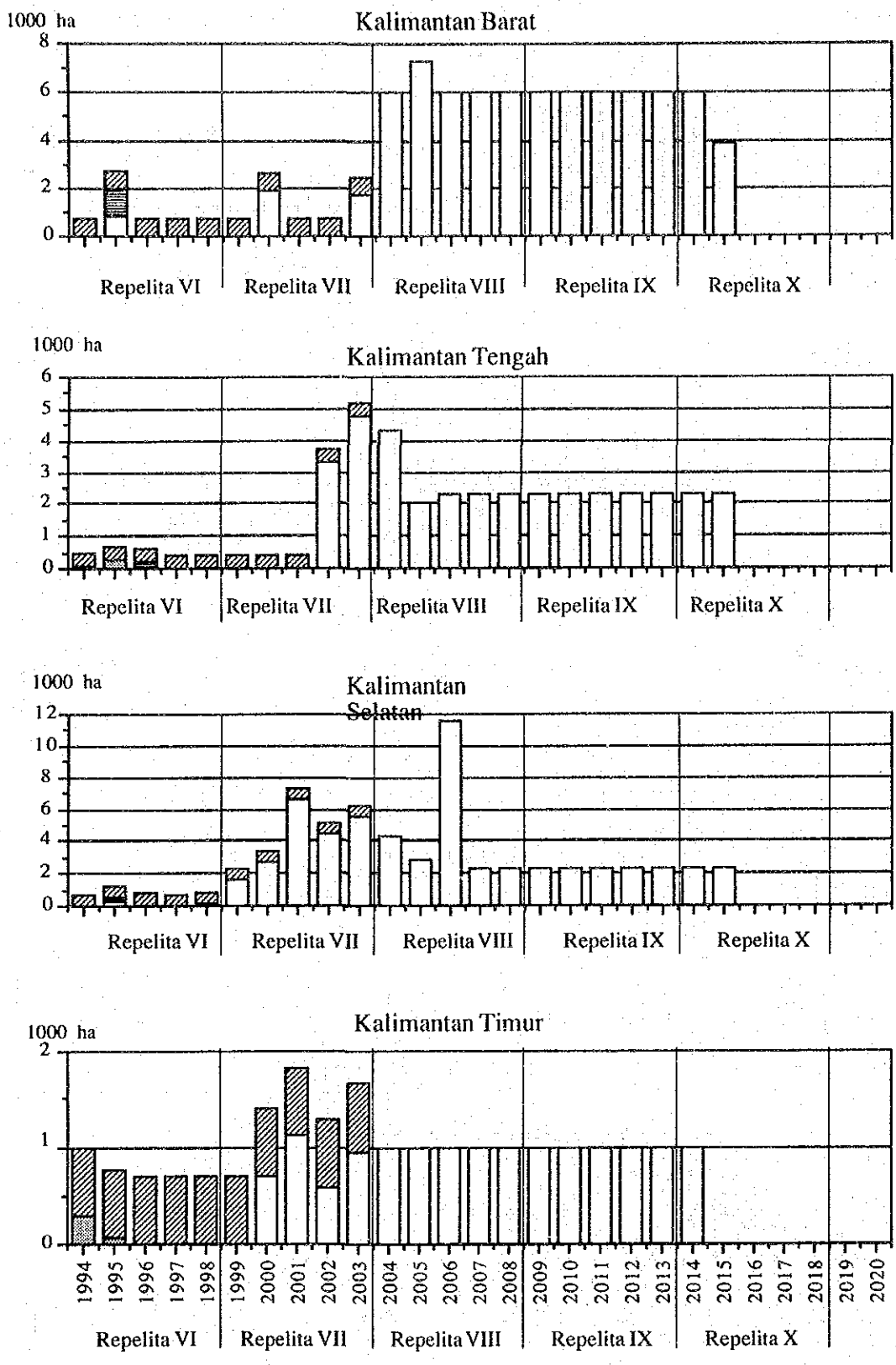

Figure 10.5 Annual Target Irrigation Development Area by Province for Zone 4

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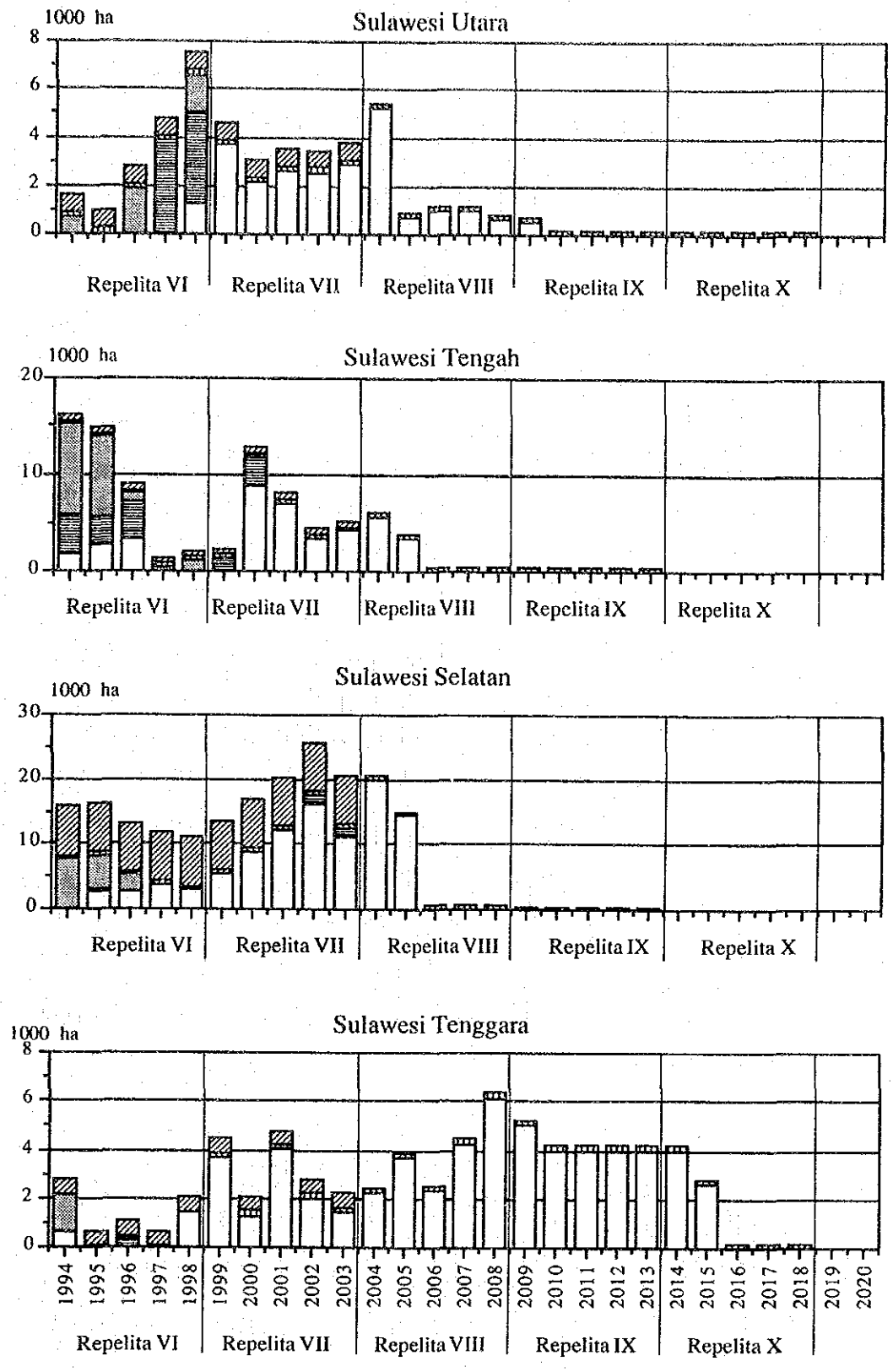

Figure 10.6 Annual Target Irrigation Development Area by Province for Zone 5

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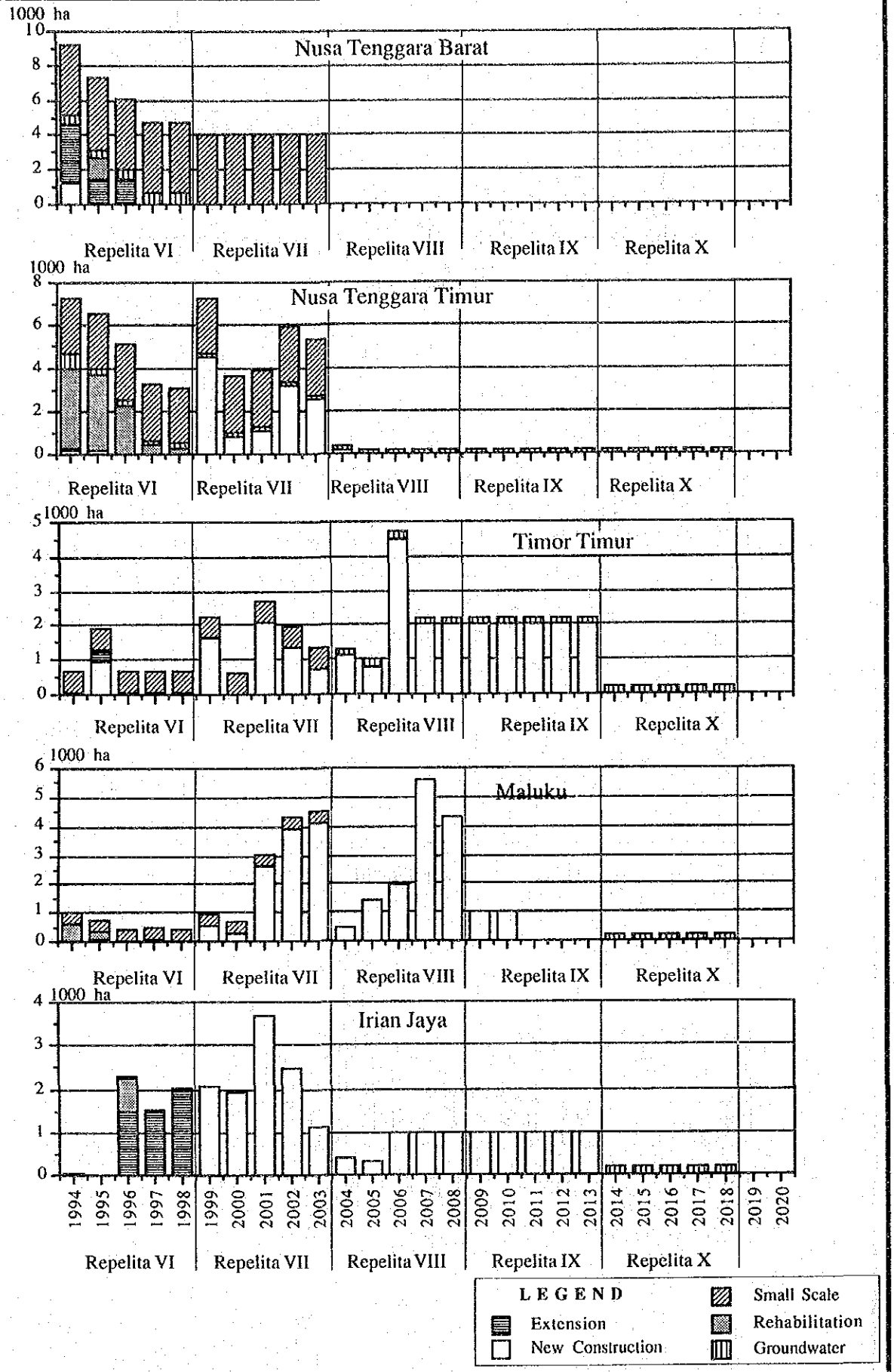

Figure 10.7 Annual Target Irrigation Development Area by Province for Zone 6

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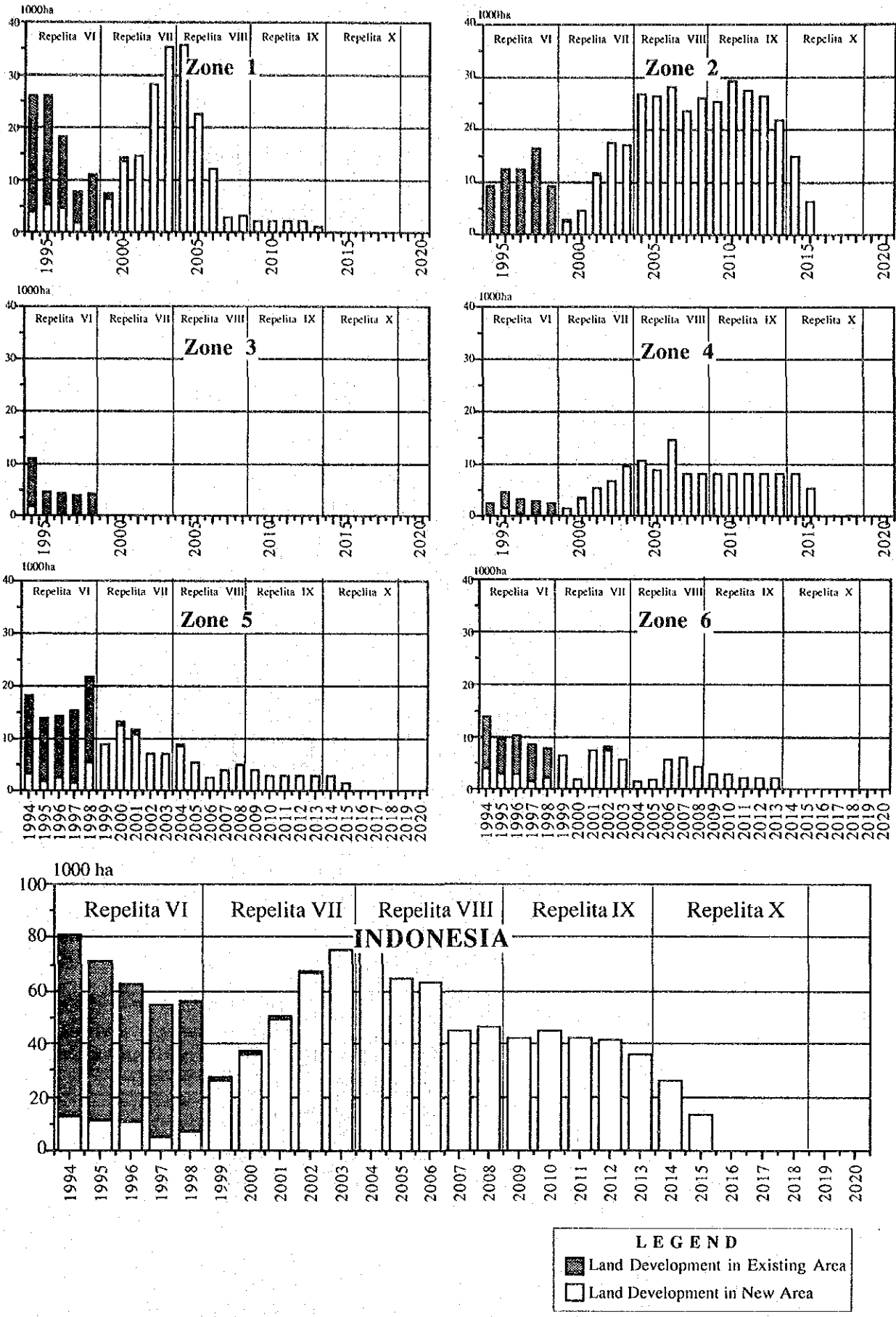

Figure 10.8 Annual Target Land Development Area by Zone and Indonesia

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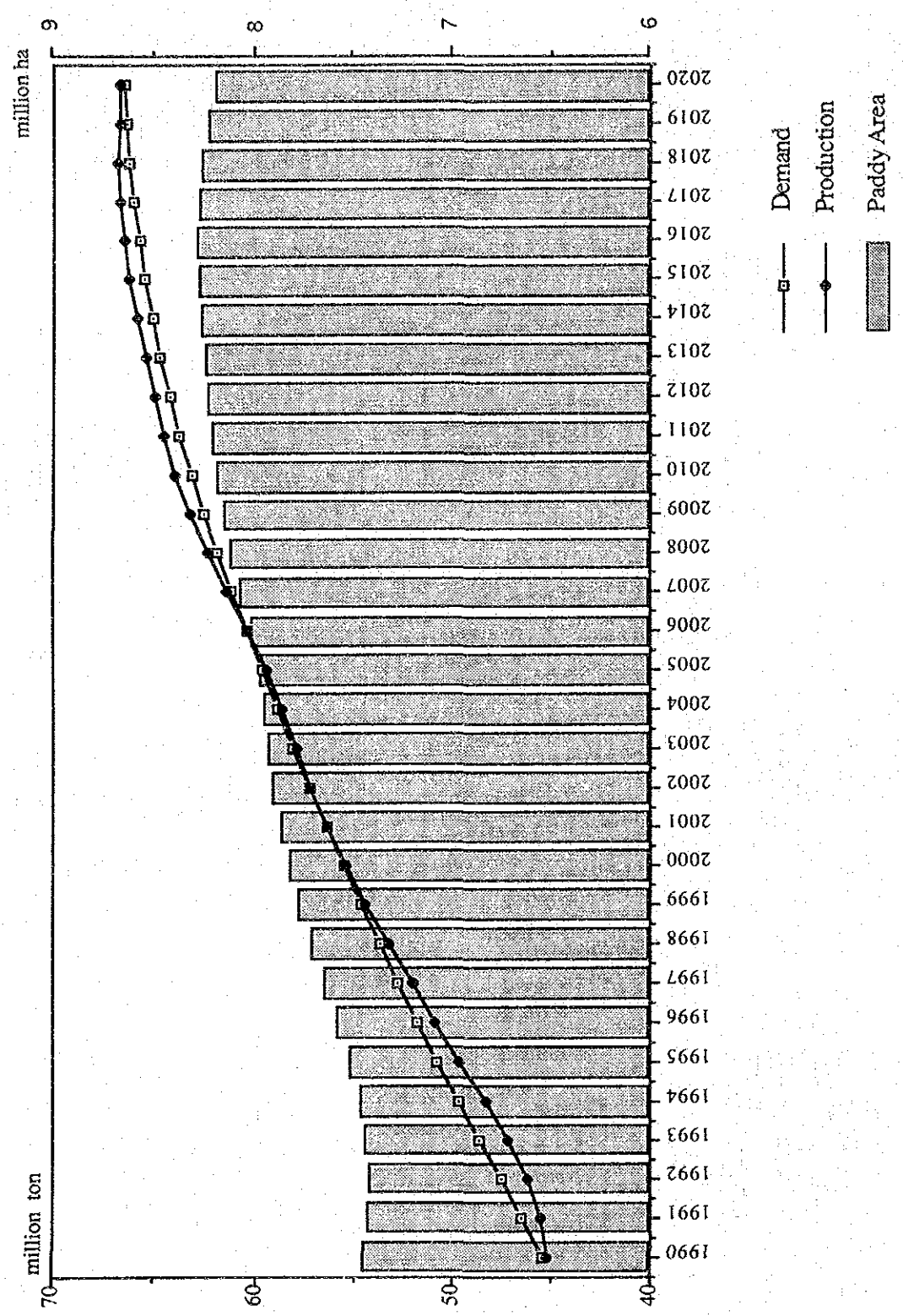

Figure 10.9 Estimated Production, Demand and Paddy Area upto 2020

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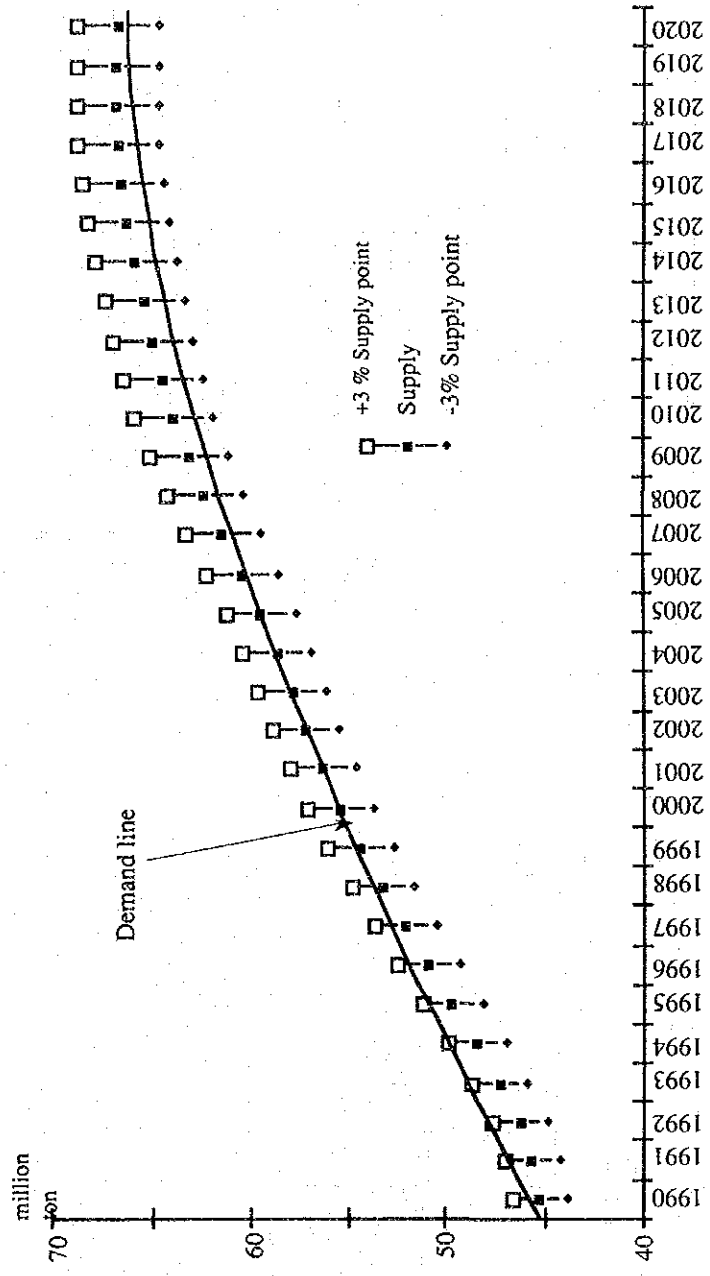

Figure 10.10 Comparison of Demand and Supply Estimation

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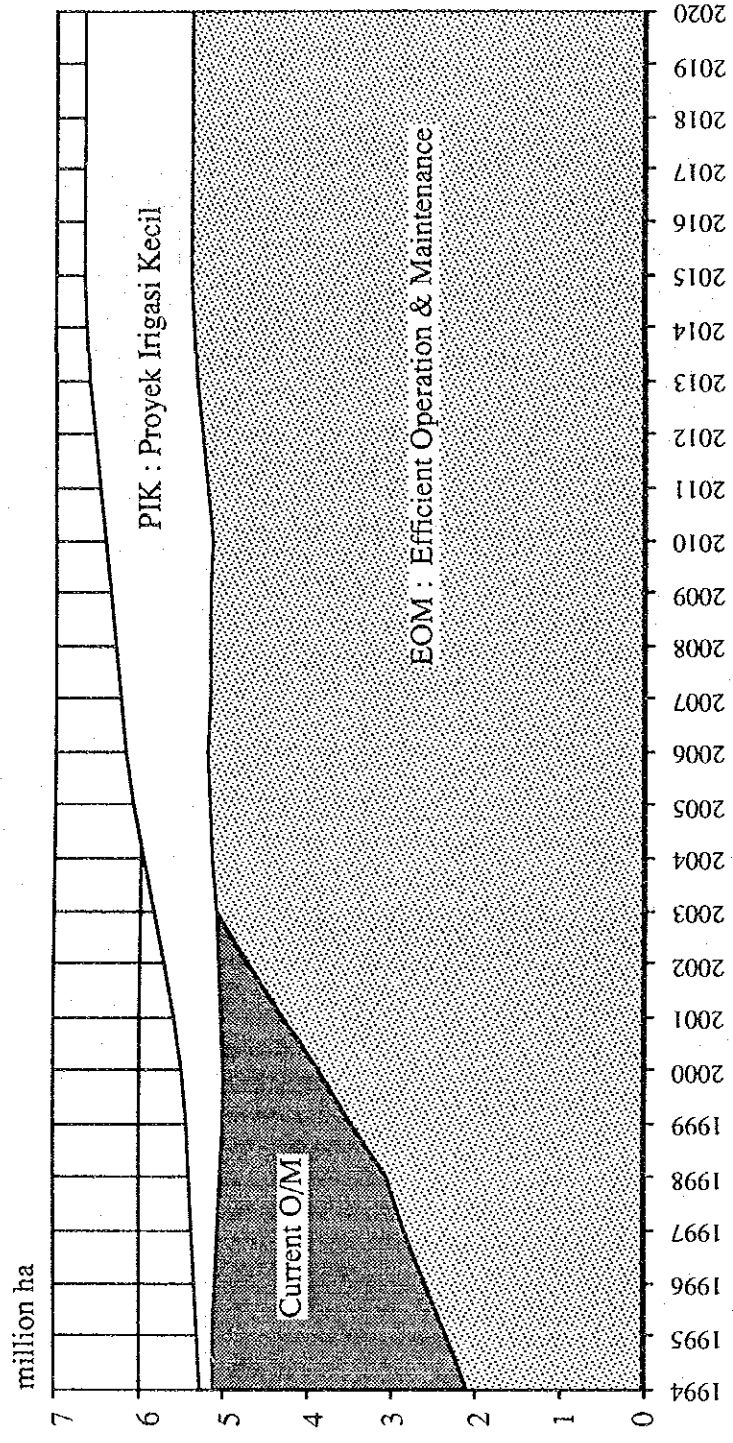

Figure 10.11 Operation Maintenance Program

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Chapter 11

11. MANAGEMENT OF IRRIGATION DEVELOPMENT PROGRAM

Formulated Irrigation Development Program should be maintained properly and revised periodically, according to the change in parameters due to the change of external circumstances.

Several agencies/institutions may be necessary to be coordinated to maintain the program, since the program covers wide range of fields including socio-economic indicators, agricultural production data, regional development plan, etc.

In this Chapter, overall flow of formulation of irrigation development program will be reviewed first, and parameters and factors considered will be enumerated. Second, a management system of the program will be proposed with alternatives.

11.1 Process for Formulation of Irrigation Development Program

The program formulation on irrigation development is made according to the following steps:

(1) Rice demand projection
(2) Paddy production projection
(3) Setting up target production and its allocation to each province
(4) Cost estimates

The flow of development formulation is schematized in Figure 11.1. In each steps, many parameters and assumptions are introduced, all of which are to be revised periodically. Those parameters and assumptions are enumerated by steps (see Table 11.1), and projection methods are briefly explained below.

11.1.1 Rice Demand Projection

Rice demand is determined by the two functions of (i) population and (ii) per capita consumption. Population projection is usually made based on the population at a base year and estimated growth rate. Per capita consumption may be estimated as a function of expenditure elasticity and price elasticity.

Population is periodically surveyed by the national census which is conducted every ten years and by inter-census survey, so-called SUPAS, between two censuses. Future population growth will, then, be projected by following past trend. Urban and rural fraction may also be projected by the above censuses.

As for per capita consumption rate, Food Balance Sheet, official publication of national consumption of food in disappearance basis, which is published every year, and the results of SUSENAS (socio-economic survey) conducted every three years that will provide food intake behavior of Indonesian people by province, will be used. While Food Balance Sheet presents national average consumption of food, SUSENAS provides information on difference in the behavior of food uptake between urban and rural and among expenditure classes.

Estimated rice demand is then converted into paddy equivalent amount, using milling rate. Although the milling rate may also be a variable with the improvement of milling machine, we deal with it as a constant. Adding feed consumption, various losses, and seed for next planting season, total disappearance base demand is calculated.

11.1.2 Paddy Production Projection

(1) Equation

Paddy production is determined simply by the two functions of (i) harvested area and (ii) yield. Harvested area is determined by also two functions of (i) paddy field area and (ii) cropping intensity. Then paddy production is calculated with the following formula:

Paddy Production = Paddy Field Area * Cropping Intensity * Yield

Cropping intensity is calculated based on the field area and harvested area. Both paddy field area and harvested area data are officially announced seasonally from CBS. Yield data is also announced seasonally from CBS. Past trend of these factors can be grasped and future projection may be done using the trend.

However, as all the three factors; paddy field area, cropping intensity and yield, have been changed as a result of human intervention such as irrigation development, land development, intensification program, etc., past trend will not necessarily be a basis for future projection.

(2) Yield

Paddy yield is mainly affected by varieties planted, applied amount of fertilizer, and water environment including irrigation. As for paddy varieties, Directorate of Food Production, DGFCA publishes the paddy sown area by variety. Recent HYVs' potential yields do not differ much, around 8 ton/ha. These HYVs' area, however, will not expand without irrigation development, as they can perform potential ability only in suitable environment in terms of fertilizer, water, etc.

Applied amount of fertilizer has been grasped by BIMAS. Dosage of fertilizer has increased over times mainly due to the government efforts on intensification program. These efforts have also been realized with irrigation development efforts. Water environment has been improved by irrigation development as well as flood control measures, which are under responsibility of DGWRD, PU.

Future yield is then estimated based on the past development degree and trend, and on future BIMAS program as well as irrigation development.

Crop cutting data being made once four months by CBS will serve as an important database. It will be analyzed by statistical methods to determine yields by eco-type; technical irrigation, semi-technical irrigation, simple irrigation, village irrigation and rainfed, and to estimate yield determinants.

(3) Paddy field area expansion

Irrigation development and land development will be considered as a source of paddy field area expansion. On-going and proposed projects which are available in DGWRD, PU, will be examined and classified into several categories by development type. Through the estimation of the effect of irrigation development by type, area change in paddy field by eco-type is estimated.

Future paddy field area, then, will be estimated by eco-type: irrigated area, rainfed area, tidal swamp area and other area.

(4) Cropping Intensity

Cropping intensity is assumed to be unchanged by eco-type. As irrigation development proceed, overall cropping intensity will increase. Past area data on paddy field area by eco-type and on paddy planted area by eco-type will be collected, and a regression analysis will be made to estimate cropping intensity by eco-type.

11.1.3 Setting up Target Production and Its Allocation to Each Province

Projected demand and supply amounts will then be compared whether the future balance is surplus or deficit. If deficit is anticipated, the deficit amount will be automatically the target production to be increased in future.

Once target production is determined, it will be allocated to each province by setting target self-sufficiency rate, deliberating such factors as national development objectives and strategies, development potential, past irrigation development performance, infrastructure development condition, human resources, etc. National development objectives and strategies are derived mainly from GBHN. Development potential is determined mostly by land and water potential. As for infrastructure development, accessibility may be the most important factor. Human resources will be interpreted by population density and socio-cultural background of people such as taste of foods, level of farming practice, etc. Data on both infrastructure and human resources will be provided from CBS Statistical Year Book and SUSENAS.

Production target set for each province will be translated into target area by irrigation development type: new irrigation including extension and land development, rehabilitation including special maintenance, village irrigation, etc., considering each development effect on paddy production increase.

Projects are scheduled to be implemented so that project effects could be realized to meet the increased demand, taking each development effect into consideration. At the same time, schedule on survey and design for those projects which have no definite development plan (feasibility study), will be made.

11.1.4 Cost Estimates

Based on the implementation schedule, costs necessary for development will be estimated. Unit costs for each development type will be estimated based on the past development areas and costs, which are available in mid-term review report of DGWRD, PU.

Costs in each year will be deflated or inflated to unify at constant price, using economic indicators published monthly from CBS. Development costs are calculated by multiplying development area with unit costs.

11.2 Maintenance and Management System of the Program

11.2.1 Frequency of Maintenance

The program should be revised periodically according to the change in external environment which will affect parameters and/or assumptions. An adequate interval for program revision will be **five (5) years** which correspond to population census interval including SUPAS.

However, individual parameter can be checked more often when basic data become available. For example trend in per capita consumption of paddy will be checked by use of the results of SUSENAS which is conducted **every three years** (next one is supposed to be issued in 1995). Area change in paddy field as well as yield increase will be monitored **annually** based on the CBS statistics to examine if estimated change in area and yield is adequate ones.

11.2.2 Institutional Arrangement

Although DGWRD should be responsible for the maintenance of irrigation development program, many fields are concerned in the process of the program formulation. For example, demand projection requires expertise in socio-economy while knowledge on agronomy and statistics are essential for supply projection. Even after the demand and supply balance study, regional development plan and/or socio-economic study as well as computer will be necessary for the allocation of production to each zone or province.

"Who should manage the program then?" will be the next subject. At present there seems no sole agency have function to deal with all of them. There may be the following three alternatives for setting up institutional arrangement to manage the program.

Alternative 1 : A new division will be created in DGWRD to maintain the program.

Alternative 2 : Some institution/university will deal with all of them.

Alternative 3 : BAPPENAS will coordinate responsible agencies to handle with data and their processing in specialized fields in consultation with institution/universities.

Alternative 1 will propose a centralized system for management and maintenance of the program. In light with the rather complicated contents of the plan with wide specialties, several staffs who have background of related expertise necessary for the revision of the program will newly be employed besides existing irrigation experts and agro-economist. All basic data other than those in irrigation for the program will be collected from each responsible agency, and the data processing will be made within the DGWRD. While it will be efficient system, formulated program may be biased in favor of irrigation without consulting other related agencies.

Alternative 2 will be proposed to cover up the disadvantage of Alternative 1. Specialized experts will analyze data from the neutral stand points. All basic data collected will be analyzed mechanically using assumption and/or parameters. However, as any parameter and/or assumption has some implication in decision making, development policies and/or direction which should be background of parameters/assumptions, will have to consult administrators or decision makers.

Alternative 3 proposes an integrated body which consists of related agencies. There will be a coordinating body, and other agencies responsible for a part of the program management. Each agency will form task force team for this purpose, and institutions/universities or consultants may be asked to join the team. Task force team in each agency will formulate a joint committee, and will meet periodically at the joint committee meeting where progress of works, information and issues/problems will be discussed.

As any development program implies certain policy in it, initiative of the program formulation should be taken by administrator. Besides, as the program covers wide range of aspects, more than one agency should be involved in the program formulation. Integration among related agencies will be developed from a series of joint works. From those points, Alternative 3 will be recommended.

11.2.3 Proposed Organization for the Maintenance of the Program

The proposed organization for the maintenance of the irrigation development program will consist of the following four agencies:

(1) BULOG;
(2) BAPPENAS;
(3) Central Bureau of Statistics (CBS);
(4) Ministry of Agriculture (MOA); and
(5) Ministry of Public Works (MPW)

BULOG and BAPPENAS will jointly act as a chairman. While BULOG is responsble for all food policy matters including rice policy, BAPPENAS will coordinate all inter-agency matters including meeting, exchange of data and information, etc. BAPPENAS will approve and confirm any agreed matter between and/or among agencies.

CBS will be responsible for population projection as well as supply of data to be processed. Any data necessary for program formulation, such as area, production, yield, socio-economy, etc. will be provided to related agencies.

MOA will be responsible for estimating per capita consumption of rice based on SUSENAS, demand projection, change in paddy field area including land conversion and irrigation development and yield change. Based on the results of analysis, paddy supply and demand projection will be revised.

MPW will be responsible for the irrigation development program itself, and also acts as a secretariat to arrange meeting and communicate with related agencies. While consulting BULOG and BAPPENAS on development direction and macro framework, required development area which will be equivalent to the required increased production to meet the demand increase projected by MOA, will largely be determined considering the irrigation effect on paddy production increase.

The relation among agencies and flow of data exchange is schematized in Figure 11.2.

Table 11.1 Parameters to be used for Formulation of Irrigation Development Program

Category/Item	Data Source	Parameters
Rice demand projection		
1. Population	Census (CBS) SUPAS (CBS)	Growth rate Urban population Rural population
2. Per capita consumption of rice	Food Balance Sheet (CBS) SUSENAS (CBS) BAPPENAS	Expenditure elasticity (urban, rural) Rice price elesticity Economic growth (urban, rural)
3. Conversion factor from rice to paddy	Food Balance Sheet (CBS)	Milling rate
4. Food consumption to total demand	Food Balance Sheet (CBS)	Seeds, losses, feeds
Paddy supply projection		
1. Paddy field area	Land area by utilization (CBS)	Cropping intensity by eco-type
2. Paddy planted area	Land area by utilization (CBS)	
3. Yield	Production of cereals (CBS) Crop cutting data from CBS Intensification program (BIMAS) Direktorat Bina Produksi, DGFCA	Past trend Yield by eco-type Fertilizer application Varietal use
4. Irrigation development effect by type	JICA-FIDP study	Paddy field area by type
5. Irrigation development projects	DGWRD	Irrigation area expansion
Setting up Target Production and Its Allocation to Each Province		
1. Land resources	RePPProt	Land suitability for paddy cultivation Land availability for development
2. Water resources	JICA-FIDP study IWRD study (BTA-155)	Unit water requirement by sector Water potential for irrigation by basin
3. Past irrigation development performance	DGWRD	
4. Infrastructure development	Statistical Year Book	Target self-sufficiency rate
5. Human resources	Statistical Year Book	
6. Regional development plan	Cipta Karya, BAPPEDA	
Cost Estimates		
1. Unit costs	DGWRD	Unit costs
2. Constant price	Indikator Ekonomi	Inflation rate
3. Irrigation development plan	DGWRD	Irrigation development area by type

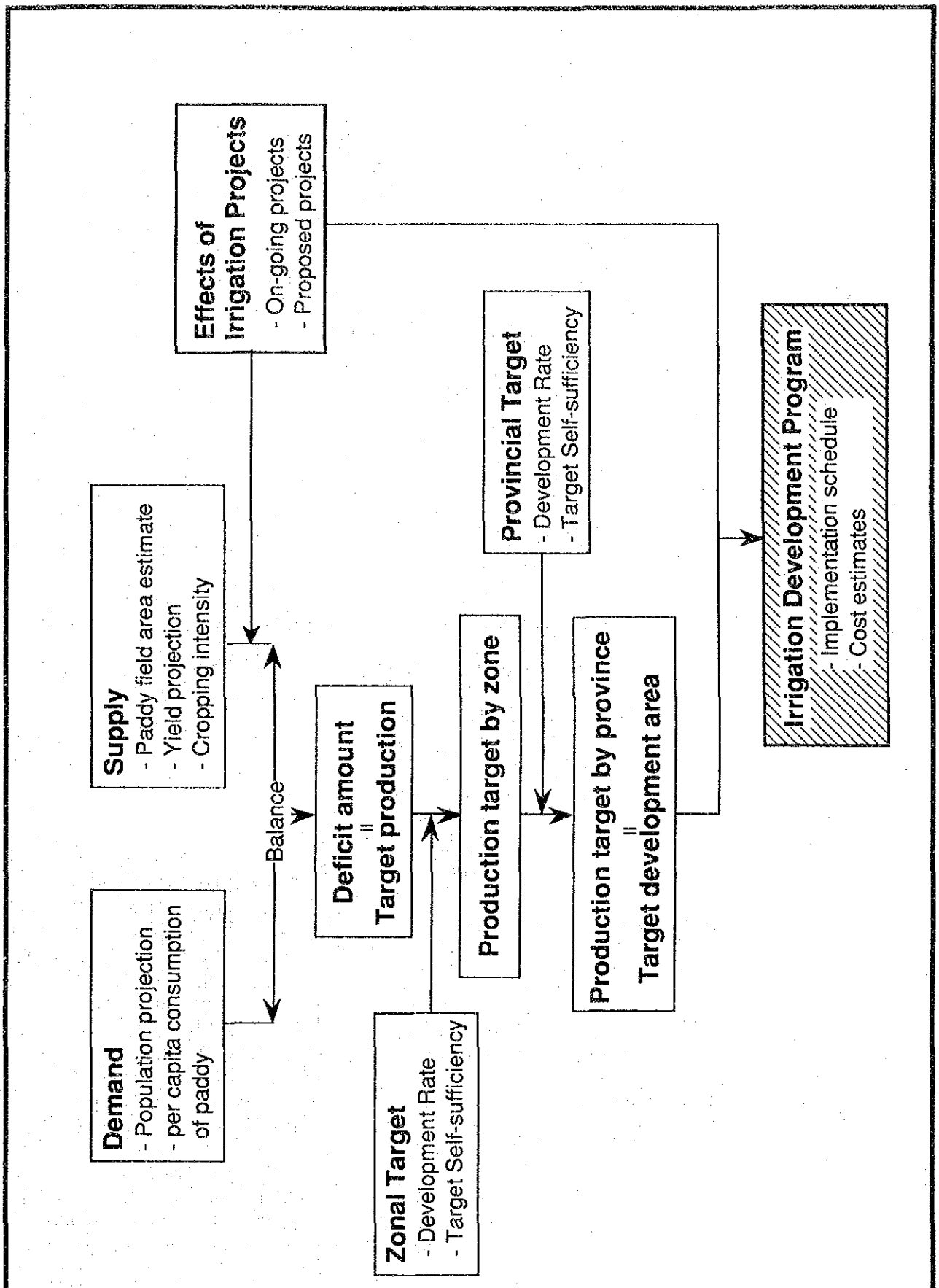

Figure 11.1 Schematic Flow of the Formulation of Irrigation Development Program

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FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
JAPAN INTERNATIONAL COOPERATION AGENCY

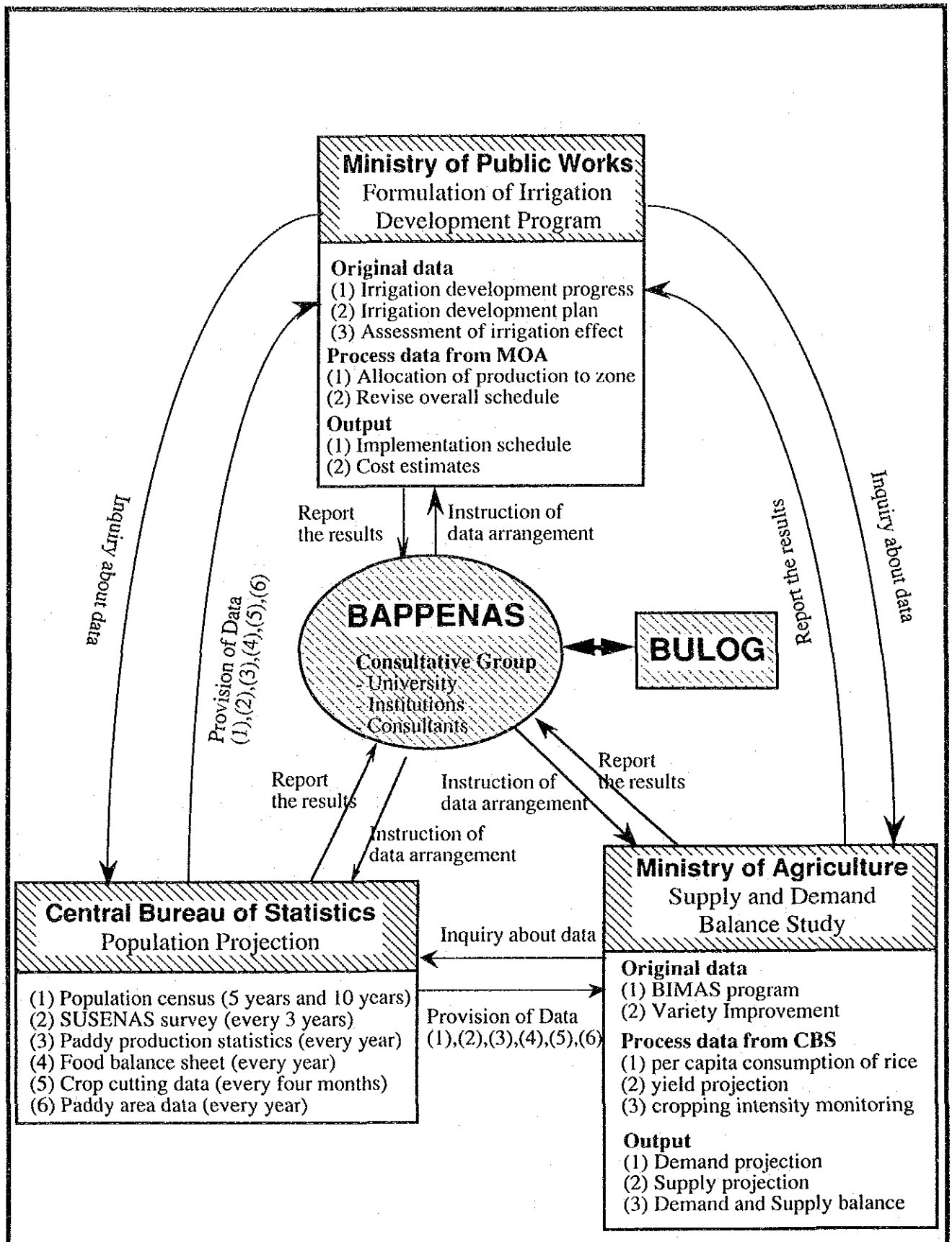

Figure 11.2 Proposed Maintenance System of Irrigation Development Program

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FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM
JAPAN INTERNATIONAL COOPERATION AGENCY

Chapter 12

12. RECOMMENDATIONS

12.1 Recommendation to DGWRD

(1) Revision of Inventory of Existing Irrigation Schemes
(Rekapitulasi Inventarisasi Daerah Irigasi Pemerintah)

Directorate Irrigation I prepares the summary of inventory of existing government-managed irrigation scheme (Rekapitulasi Inventarisasi Daerah Irigasi Pemerintah) annually. It compiles mainly the dimension of the existing schemes; design area, irrigated area, canal length, number of structure, planted area, etc. However, such data as construction costs, construction year, present condition of the structures (necessity of rehabilitation), name of person responsible for O&M works, O&M costs, are not available. Net irrigated area can not be grasped from the data since the present condition of existing facilities are not described, which may cause the contradiction on irrigated area with CBS data. It is expected that the importance of O&M of existing facilities is emphasized more and more in the future, and that justification of the necessity of rehabilitation works is required as a basis for budgeting. It is recommended, on the basis of the above consideration, that the contents of present inventory be revised adding information to fill the above requirement.

(2) Collection of Data on Project Stage of Proposed Projects

It is unfortunate that data on project stage of proposed projects which is one of the important criteria for priority ranking were not be able to be collected in the study period. The number of proposed projects differs much among provinces, and some province has already excessive number of proposed projects from the viewpoints of spatially equitable development. For the effective planning of irrigation development, project status (identification stage, feasibility study stage and detailed design) should be examined as soon as possible, with other data necessary for priority ranking.

(3) Enforcement of Connection between DGWRD and Provincial Offices

It is recommended that DGWRD would communicate with provincial office in the following manner with regards to the exchange of data and information:

(a) Regarding the data to be collected from provincial offices periodically, DGWRD shall list up all data, prepare the specification of each data (preferably with sample output by computer), and inform deadline and destination of data with each

provincial office. This work shall be done in Directorate of Planning (Bina Program Pengairan; BPP) in consultation with related Directorates.

(b) Each provincial office shall prepare the required data and put it into computer. The preparation of data shall be made in one section, which is also responsible for the data management. The revision of data shall be made at a certain period of a year only, and no other correction or revision shall be made.

(c) Data prepared by each provincial office shall be transmitted to related Directorates via BPP, DGWRD by using computer network. Communication method using computer network to be introduced shall be similar to that already introduced by PIADP project.

Through the establishment of the above system, unification of data will be maintained, and contradiction of figures by different data sources will be prevented.

(4) Crop Production Increase as a Standard for Irrigation Development Planning

Ultimate objective of irrigation development is to increase crop production. Irrigation development, therefore, will be evaluated by the attainment of crop production increase after the development rather than by the achievement of works scheduled. Being self-sufficient, necessary amount of paddy production to be increased is regulated by the demand increase. It is therefore recommended that future irrigation development scale be determined considering irrigation development effect on crop production increase, given the self-sufficiency in rice be maintained. In this sense, decision makers should be careful in crop production trend more than before, discussing not only with other staffs in DGWRD but also with MOA officials.

(5) Study on Development of Eastern Region

In line with the government policy on poverty alleviation and equitable development, irrigation development may be more directed to eastern region. However, deliberate planning will be necessary for determining development target taking into consideration of socio-cultural background (staple food, cultivated crops, level of farming practice, etc.) of local people, degree of social infrastructure development, land and water resources. Disordered development will not benefit the local people but even bring about the adverse effect on environment. For example, in order to be self-sufficient in Irian Jaya in 2018, 80 thousand ha of irrigation development will be required, given cropping intensity of 1.5 and yield of 4.5 ton/ha. In view of present irrigation are of 5,000 ha, and not much popularity on paddy

cultivation in the island, realization of full development (80 thousand ha) may take longer time.

(6) Irrigation Development in Sumatera

In Sumatera, which is expected to be a rice supply center in place of Jawa in future, proposed irrigation development projects are mainly located in northern area although big land and water potential is identified also in southern area. It is recommended from the well-balanced development policy that irrigation development plan be formulated for the southern Sumatera area as soon as possible to prepare implementation.

12.2 Recommendation to MOA

(1) Revision of Rice Demand Projection

It is recommended that MOA would revise the paddy demand projection through the periodical revision of per capita rice consumption by using Food Balance Sheet and SUSENAS survey and through revision of population projection. Next projection will be made in 1997.

(2) Revision of Paddy Production Projection

In order to revise paddy production projection periodically, monitoring of planted area, harvested area and yield on lowland and upland paddy should be continued. If yield increase is lower than that estimated in the Study, production have to be increased by paddy area expansion, for which irrigation development is indispensable.

Planting time of paddy (both lowland and upland) tends to be strongly affected by rainfall pattern. Climatic data, especially on rainfall, should be monitored to judge if the objective year be climatically abnormal (drought or flood).

Crop cutting data of which CBS conducts once four months has not been fully utilized despite of many valuable information on the original data sheet. In the Study, yield is compared among irrigation level and fertilizer level statistically, based on the cropping cutting data in January to April, 1991, which is used as a basis for future yield estimation. However, due to the time limitation, comparison on yield under different harvesting season

was not made. Factorial analysis on yield determinants should be made periodically using CBS's crop cutting data in each season.

(3) Irrigation Development as a Measure to Attain Paddy Production Increase

In relation to the formulation of Repelita VI, MOA set target paddy production amount with harvest area, yield and cropping intensity. However, detailed strategy and measures seem have not been deeply studied except land development. MOA, being responsible for crop production including rice, should make a detailed strategy how to increase paddy production, and make measures including BIMAS program, irrigation, etc.

Appendices

Appendices

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Appendix A List of Counterpart Personnel

Name	Organization
Ir. A. Somantri	Chief of Program and Budgeting, Directorate of Planning and Programming
Ir. B. Pramono	Chief of Program and Budgeting, Directorate of Planning and Programming
DR. Ir. M. Basuki	Chief of Planning & Programming Section
Drs. Isnugroho	Chief of Water Resources Section
Drs. B. Trenggono	Chief of Annual Programming Region I Section
Drs. Subroto	Chief of Annual Programming Region II Section
Asep Suharto	Staff of Planning & Programming Section
Drs. Enny Rusnawati	Staff of Region I

Appendix B List of Advisory Committee Members

Name	Organization	Assignment
Y. Tobita	MAFF	Chairman (1992 March ~ 1993 April)
M. Mizoguti	MAFF	Chairman (1993 May ~ 1993 November)
K. Oikawa	MAFF	Member (1992 March ~ 1993 April)
D. Kusano	MAFF	Member (1992 March ~ 1993 April)
T. Matsutomi	MAFF	Member (1992 March ~ 1993 April)
N. Kuniyasu	MAFF	Member (1993 May ~ 1993 November)

MAFF : Ministry of Agriculture, Forestry and Fishery

Appendix C List of Study Team Members

Name	Organization	Assignment
Kunihiro Yasuhiko	NK	Team Leader
Kojima Akira	NK	Development Planner/ Land Use Planner
Kimijima Takashi	NK	Agro-economist
Wada Genshichi	NK	Agriculturist
Nomoto Takeshi	JIRCO	Irrigation and Drainage Engineer
Igawa Takuya	NK	System Engineer
Hayashi Yasuhiko	JIRCO	Statistics Specialist
Nishiya Mitsuo	NG	Soil Scientist
Kubota Chikanori	JIRCO	Meteorologist and Hydrologist
Kitaguchi Takashi	PCI	Environmentalist
Matsuo Takasi	NK	Marketing
Tamura Tsutomu	NK	Assistant

NK : Nippon Koei Co., Ltd.
JIRCO : Japan Irrigation Reclamation Consultants Co., Ltd.
NG : Nippon Giken Co., Ltd.
PCI : Pacific Consultants International

SCOPE OF WORK

ON

THE STUDY

FOR

FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM

IN

THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN

DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT

MINISTRY OF PUBLIC WORKS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

SIGNED IN JAKARTA

21st NOVEMBER,. 1991

IR. DJOKO S. SARDJONO

DIRECTOR OF PLANNING
AND PROGRAMMING,
DIRECTORATE GENERAL OF
WATER RESOURCES DEVELOPMENT,
MINISTRY OF PUBLIC WORKS

MR. KAZUO HARADA

LEADER,
PREPARATORY STUDY TEAM,
JAPAN INTERNATIONAL
COOPERATION AGENCY

I. INTRODUCTION

In response to the request of the Government of the Republic of Indonesia (hereinafter referred to as " the Government of Indonesia), the Government of Japan has decided to conduct the Study for Formulation of Irrigation Development Program (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Indonesia.

The Directorate General of Water Resources Development, the Ministry of Public Works (hereinafter referred to as "DGWRD"), shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the scope of work with regard to the above-mentioned Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To formulate a national irrigation development program, in a long term range, which provides the current and future Repelita with rationale and guideline of new irrigation development plans having regional and chlonological priority, in line with overall food production increase program, thus contributing to the sustainment of self sufficiency of rice, and

2. To carry out technology transfer to the Indonesian counterpart personnel in the course of the Study.

III. SCOPE OF THE STUDY

1. Study Area

The Study covers the whole Indonesia.

2. Scope of the Study

The study will be composed of the following items.

(1) Rice demand study

1) projection of population increase
2) projection of rice consumption

These estimates will be made in provincial level on the basis of existing data and information.

(2) Irrigation development potential study

1) identification and evaluation of development potential of water and land resources
2) estimation of irrigation development cost

These estimates will be made in provincial level on the basis of existing data and information.

(3) Study on irrigated agriculture development plan in province

Collection, review and analysis of relevant existing data and information including;

1) natural conditions (topography, meteorology, hydrology, geology, pedology, water quality),

2) social and economic conditions (regional socio-economy, labor force and unemployment rate, regional development programs, agricultural sector plan, social infrastructure, farmers' organization, transmigration),

3) agriculture (land use, cropping pattern, yield/production, farming practices, farmers' economy, land tenure, processing, marketing),

4) agricultural infrastructure (existing irrigation and drainage systems, needs of rehabilitation, operation and maintenance), and

5) others

These study will be conducted on the basis of existing data and information

(4) Inventory survey and review of existing, on-going and potential irrigation development projects.

1) data collection and compilation

2) data analysis and evaluation

3) classification of projects

(5) Establishment of long term irrigation development target.

1) target of development area upto the Repelita X.

2) necessary costs to achieve the target

(6) Formulation of a national irrigation development program consisting of;

1) selection criteria for priority projects,

2) development sequence by development scale, type of project and province, and

3) rolling plan of development program.

IV. WORK SCHEDULE

The Study will be carried out in accordance with the tentative schedule attached in Annex.

V. REPORT

JICA will prepare and submit the following reports in English to the Government of Indonesia.

1. Plan of Operation
   Twenty (20) copies at the beginning of the Study.

2. Inception Report
   Twenty (20) copies one month after beginning of the Study.

3. Progress Report
   Twenty (20) copies at the end of the second and the forth field work.

4. Interim report
   Twenty (20) copies at the end of the third field work.

5. Draft Final Report
   Twenty (20) copies at the end of the Home office work
   The Government of Indonesia shall, if any, present comments on the Draft Final Report to JICA within one (1) month after receiving the Draft Final Report.

6. Final Report
   Fifty (50) copies within two (2) months after receipt of comments on the Draft Final Report.

VI. UNDERTAKING OF THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

1. To facilitate smooth conduct of the Study, the Government of Indonesia will take necessary measures;

(1) to secure the safety of the Japanese study team,

(2) to permit the members of the Japanese study team to enter, , leave and sojourn in the Republic of Indonesia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into the Republic of Indonesia for the conduct of the Study,

(4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study.

(5) to provide necessary facilities to the Japanese study team for the remittance as well as the utilization of the funds introduced into the Republic of Indonesia from Japan in connection with the implementation of the Study,

(6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,

(7) to secure permission for the Japanese study team to take all data and documents related to the Study out of the Republic of Indonesia to Japan by the Japanese study team, and

(8) to provide medical services as needed. Its expenses will be chargeable on the members of the Japanese study team.

2. The Government of Indonesia shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

(1) to dispatch, at its own expense, the study team to the Republic of Indonesia, and

(2) to pursue technology transfer to the Indonesian counterpart personnel in the course of the Study in Indonesia as well as in Japan.

VIII. OTHERS

JICA and DGWRD shall consult with each other in respect of any matter that may arise from or in connection with the Study.

ANNEX

TENTATIVE WORK SCHEDULE

MONTH	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Field Work in Indonesia	▭ ▭ ▭ ▭
Home Office Work in Japan	▭ ▭
Submission of Reports	△ △ P/O IC/R △ P/R(I) △ I/TR △ P/R(II) △ DF/R △ F/R

(Note) P/O : Plan of Operation IC/R : Inception Report
P/R : Pogress Report IT/R : Inrerim Report
DF/R : Draft Final Report F/R : Final Report

MINUTES OF MEETING

FOR

THE SCOPE OF WORK

ON

THE STUDY

FOR

FORMULATION OF IRRIGATION DEVELOPMENT PROGRAM

IN

THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN

DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT

MINISTRY OF PUBLIC WORKS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

SIGNED IN JAKARTA,

21st NOVEMBER, 1991

IR. DJOKO S. SARDJONO

DIRECTOR OF PLANNING
AND PROGRAMMING,
DIRECTORATE GENERAL OF
WATER RESOURCES DEVELOPMENT,
MINISTRY OF PUBLIC WORKS

MR. KAZUO HARADA

LEADER,
PREPARATORY STUDY TEAM,
JAPAN INTERNATIONAL
COOPERATION AGENCY

5. The Team requested DGWRD to provide a suitable office with necessary furniture in JAKARTA.

6. DGWRD requested JICA to provide, in connection with the implementation of the Study, following vehicles and equipments:

   1) Vehicles

   2) Personal Computer Sets

   3) Copying Machine

7. DGWRD requested JICA to provide the counterpart personnel concerned of the Study with training in Japan.

LIST OF ATTENDANTS

INDONESIAN SIDE

Mr. S. Hadiwijono	Chief Sub Dit. of Foreign Aid Adm. Dit. of Planning & Programming, DGWRD
Mr. Somantri	Chief Sub Dit. of Budget & Program Dit. of Planning & Programming, DGWRD
Mr. Soekrasno	Sub Dit. of Planning & Design Dit. of Irrigation I, DGWRD
Mr. S. Sugeng	Sub Dit. of Planning & Design Dit. of Swamp, DGWRD
Mr. Dhono Bantolo	Sub Dit. of Foreign Aid Adm. Dit. of Planning & Programming, DGWRD
Mr. B. Prihono	Sub Dit. of Planning & Design Dit. of Irrigation II, DGWRD
Mr. Pudjiono K.	Sub Dit. of Planning & Design Dit. of Irrigation II, DGWRD
Mr. M. Tampubolon	Sub Dit. of Planning & Design Dit. of Irrigation I, DGWRD
Mr. Bambang Pramono	Sub Dit. of Budget & Program Dit. of Planning & Programming, DGWRD
Mr. Bambang Trenggono	Sub Dit. of Budget & Program Dit. of Planning & Programming, DGWRD
Mr. Bambang Priyitno	Sub Dit. of Foreign Aid Adm. Dit. of Planning & Programming, DGWRD
Mr. M. Soesatyo	Sub Dit. of Foreign Aid Adm. Dit. of Planning & Programming, DGWRD
Mr. Acep Sohib Husen	Sub Dit. of Foreign Aid Adm. Dit. of Planning & Programming, DGWRD
Mr. Yayat Hidiyat	Sub Dit. of Foreign Aid Adm.. Dit. of Planning & Programming, DGWRD

EMBASSY OF JAPAN

Mr. Norimichi Kadoya	First Secretary (Agriculture)

JICA INDONESIA OFFICE

Mr. Hirohiko Takata	Assistant Resident Representative

JICA EXPERT

Mr. Katsuhiko Kimura	Colombo Plan Expert Dit. of Planning & Programming, DGWRD

JAPANESE SIDE

Mr. Kazuo Harada	Leader, JICA Preparatory Study Team
Mr. Daisuke Kusano	Member, JICA Preparatory Study Team
Mr. Kazuhiko Oikawa	Member, JICA Preparatory Study Team
Mr. Susumu Sugatani	Member, JICA Preparatory Study Team
Mr. Hiromi Motomura	Member, JICA Preparatory Study Team