

TABLE E. 2. 2 - 14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2004				2005				Total			
	x Million Rls		x Million Rls		x Million Rls		x Million Rls		x Million Rls		x Million Rls	
	Fin. F.C.	Fin. L.C.	Fin. F.C.	Fin. L.C.	Fin. F.C.	Fin. L.C.	Fin. F.C.	Fin. L.C.	Fin. F.C.	Fin. L.C.	Fin. F.C.	Fin. L.C.
E. Amol West District (1)												
1. Construction Cost												
1.1. Storage Dam	10	0	0	0	0	0	0	0	0	0	0	0
1.2. Diversion Dam												
1.3. Main Canal/Drain												
1.4. Secondary Canal	15	77	85	162								
1.5. Tertiary Canal	15	118	149	267								
1.6. Land Consolidation	15	1,757	730	2,487	10	1,171	485	1,657	11,713	4,866	15,579	16,467
1.7. River Training	15	53	8	61	15	36	5	41	11,713	4,754	16,467	16,467
1.8. O/M Road	15	32	11	43	15	36	7	43	354	53	407	407
1.9. Miscellaneous	15	32	2	34	15	22	1	23	354	73	427	427
- AW-I Sub-total (1) -		2,037	974	3,011		1,228	492	1,720	14,288	7,427	21,715	21,715
2. Procurement of Equipment		2,037	902	2,939		1,228	485	1,713	14,288	6,780	21,068	21,068
3. Survey & Investigation												
4. D.D. and Supervision	5	86	113	199					2,388	2,620	5,008	5,008
5. Building/Motor Pool		86	91	177					2,388	186	2,574	2,574
6. Land Acquisition												
7. D & M Equipment	50	203	23	226	50	203	23	226	2,388	552	2,940	2,940
8. Administration (% of 1.)	5%	102	49	151	5%	61	25	86	260	442	702	702
9. Physical Contingency (% of 1.)	10%	204	97	301	10%	123	49	172	1,720	2,260	3,980	3,980
- AW-I Total (1-9) -		2,632	1,256	3,888		1,615	589	2,204	1,720	1,814	3,534	3,534
10. Price Contingency		4,620	7,079	11,699		2,971	3,894	6,865	28	34	62	62
F.C. 4.8%		4,620	6,459	11,079		2,971	3,750	6,721	28	34	62	62
L.C. 15.5%									0	0	0	0
Total		7,252	8,335	15,587		4,586	4,423	9,009	54,167	60,812	114,979	114,979
		7,252	7,605	14,857		4,586	4,326	8,912	54,167	53,767	107,934	107,934

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	1993				1994				1995			
	Total		x Million Rs		Total		x Million Rs		Total		x Million Rs	
	Fin.F.C. Eco.F.C.	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	%	Fin.F.C. Eco.F.C.	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	%	Fin.F.C. Eco.F.C.	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	%
F. And West District (II)	0	0	0	0	0	0	0	0	0	0	0	0
1. Construction Cost												
1.1. Storage Dam	174	261	435	0								
1.2. Diversion Dam	174	235	409	0								
1.3. Main Canal/Drain	1,226	1,739	2,965	0								
1.4. Secondary Canal	2,081	3,248	5,329	0								
1.5. Tertiary Canal	1,637	2,573	4,210	0								
1.6. Land Consolidation	1,637	1,942	3,579	0								
1.7. River Training	13,501	3,946	17,447	0								
1.8. O/W Road	775	134	889	0								
1.9. Miscellaneous	521	27	548	0								
1.9. Miscellaneous	521	44	565	0								
- AM-II Sub-Total (1) -	19,915	11,432	31,347	0	0	0	0	0	0	0	0	0
2. Procurement of Equipment	5,486	528	5,984	0								
3. Survey & Investigation	432	918	1,350	0								
4. D.D. and Supervision	3,936	5,171	9,107	0								
5. Building/Motor Pool	3,936	4,137	8,073	0								
6. Land Acquisition and Compensation	64	96	160	0								
7. O & N Equipment	0	2,325	2,325	0								
8. Administration (% of 1.)	675	75	750	0								
9. Physical Contingency (% of 1.)	996	572	1,568	0								
- AM-II Total (1-9) -	33,466	22,260	55,726	0	20	13	32	50	32	19	32	755
10. Price Contingency	52,279	18,589	70,868	0								
F.C. 4.8 %	52,279	83,305	135,584	0								
L.C. 15.5 %	52,279	70,862	123,161	0								
Total	85,745	105,585	191,310	0	27	44	71	533	248	44	533	1,288
	85,745	89,580	175,325	0	27	35	62	533	248	35	533	1,921

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	1995			1996			1997			1998			1999		
	Fin.F.C. %	Fin.L.C. %	Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total %
F. Amal West District (II)															
1. Construction Post															
1.1. Storage Dam															
1.2. Diversion Dam	30	52	76	130	40	70	104	174	30	52	76	130	0	0	0
1.3. Main Canal/Drain		52	71	123	10	70	94	164	71	123	184	261	0	0	0
1.4. Secondary Canal				123		123	174	263			184	210	184	210	394
1.5. Tertiary Canal				123		123	140				208	325	208	325	533
1.6. Land Consolidation											257	455	208	257	455
1.7. River Training											164	210	164	210	374
1.8. O/M Road											164	318	164	318	485
1.9. Miscellaneous											154	318	154	318	485
-AW-II Sub-Total (I) -		52	76	130		193	278	471		608	874	1,482		2,098	3,241
2. Procurement of Equipment		52	71	123		193	294	427		608	852	1,300		2,035	3,074
3. Survey & Investigation	50	216	459	675		197	259	456	50	2,728	264	2,992	50	2,728	2,952
4. D.D. and Supervision		216	367	583		197	207	404		394	517	911	15	590	776
5. Building/Motor Pool	30	19	29	46		197	207	404		394	414	808		590	821
6. Land Acquisition and Compensation		19	23	42		0	1,163	1,163	50	0	1,153	1,153		590	1,211
7. O & M Equipment						0	930	930		0	930	930			
8. Administration (% of I.)	5%	3	4	7		10	14	24		30	44	74		102	162
9. Physical Contingency (% of I.)	10%	3	4	7		10	12	22		30	35	65		102	154
(% of 1.)		5	8	13		19	28	47		61	87	148		204	325
(% of 1.)		5	7	12		19	23	42		61	69	130		204	308
- AW-II Total (1-9) -		285	578	873		419	1,742	2,161		3,821	2,949	6,770		5,650	8,086
10. Price Contingency		295	472	767		419	1,406	1,825		3,821	2,351	6,172		5,650	7,665
F.C. 4.8%		356	1,029	1,385		530	3,561	4,111		5,062	7,091	12,083		7,859	14,511
L.C. 15.5%		356	840	1,196		530	2,890	3,420		5,062	5,581	10,643		7,859	13,414
Total		651	1,607	2,258		949	5,323	6,272		8,883	9,950	18,633		13,519	22,597
		651	1,312	1,963		949	4,296	5,245		8,883	7,932	16,815		13,519	21,100

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2000			2001			2002			2003		
	Fin.F.C. %	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	Fin.F.C. %	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	Fin.F.C. %	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total	Fin.F.C. %	Fin.L.C. Eco.L.C.	Fin.Total Eco.Total
F. Amol West District(H)												
1. Construction Cost												
1.1. Storage Dam	15	0	0	0	0	0	0	0	0	0	0	0
1.2. Diversion Dam												
1.3. Main Canal/Drain	15	184	261	184	261	445	184	261	445	184	261	445
1.4. Secondary Canal	15	312	487	312	487	799	312	487	799	312	487	799
1.5. Tertiary Canal	15	246	386	246	386	698	246	386	698	246	386	698
1.6. Land Consolidation	10	1,350	395	1,745	592	2,337	2,025	592	2,617	2,025	592	2,617
1.7. River Training	10	78	11	89	17	106	116	17	133	116	17	133
1.8. O/M Road	10	52	3	55	78	130	78	78	156	78	78	156
1.9. Miscellaneous	10	52	4	56	78	130	78	78	156	78	78	156
- AW- II Sub-Total (I) -		2,222	1,472	3,694	2,961	4,637	2,961	4,637	7,598	2,961	4,637	7,598
2. Procurement of Equipment		2,222	1,244	3,466	2,961	1,453	4,414	2,961	1,453	4,414	2,961	1,453
3. Survey & Investigation												
4. D.D. and Supervision	15	590	776	1,366	590	776	1,366	590	776	1,366	590	776
5. Building/Motor Pool		590	621	1,211	590	621	1,211	590	621	1,211	590	621
6. Land Acquisition and Compensation												
7. O & M Equipment												
8. Administration (% of I.)	5%	111	74	185	148	232	148	148	296	148	148	296
9. Physical Contingency (% of I.)	10%	222	147	369	296	464	296	296	592	296	296	592
- AW- II Total (I~9) -		3,145	2,485	5,630	3,995	2,704	6,699	3,995	2,704	6,699	3,995	2,704
10. Price Contingency		3,145	2,351	5,496	3,995	2,992	6,987	3,995	2,992	6,987	3,995	2,992
F.C. 4.8%		4,576	7,519	12,095	6,092	9,681	15,773	6,092	9,681	15,773	6,092	9,681
L.C. 15.5%		4,576	6,496	11,072	6,092	8,384	14,476	6,092	8,384	14,476	6,092	8,384
Total		7,721	10,288	18,009	10,087	12,695	22,782	10,087	12,695	22,782	10,087	12,695
		7,721	8,547	16,268	10,087	10,676	20,763	10,087	10,676	20,763	10,087	10,676

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2004					2005					Total					
	x Million Ris					x Million Ris					x Million Ris					
	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total	
E. Arul West District(H)																
1. Construction Cost																
1.1. Storage Dam	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1.2. Diversion Dam																
1.3. Main Canal/Drain																
1.4. Secondary Canal	10	208	325	533	10	208	325	533								
1.5. Tertiary Canal	10	164	210	374	10	164	210	374								
1.6. Land Consolidation	15	2,025	592	2,617	10	1,350	385	1,745	10	1,350	385	1,745				
1.7. River Training	15	116	17	133	10	78	11	89	10	1,350	387	1,747				
1.8. O/M Road	15	78	4	82	10	52	3	55	10	78	15	94				
1.9. Miscellaneous	15	78	7	85	10	52	4	56	10	52	4	56				
- AM-II Sub-Total (1) -		2,591	1,148	3,739		1,852	944	2,796		1,480	409	1,889		19,917	11,438	31,353
2. Procurement of Equipment		2,591	1,037	3,628		1,852	828	2,680		1,480	417	1,897		19,917	9,920	29,837
3. Survey & Investigation																
4. D.D. and Supervision	10	394	517	911	5	197	259	456								
5. Building/Motor Fuel		394	414	808		197	207	404								
6. Land Acquisition and Compensation																
7. O & M Equipment					50	338	38	376	50	338	38	376				
8. Administration (% of 1.)		130	57	187		388	30	368		338	30	368				
9. Physical Contingency (% of 1.)		130	52	182		93	47	140		74	20	94				
- AM-II-Total (1-9) -		3,374	1,837	5,211		2,865	1,382	4,047		2,040	508	2,548		33,489	22,270	55,759
10. Price Contingency		5,922	10,354	16,275		4,902	8,997	13,899		3,933	3,820	7,753		33,489	18,792	52,281
F.C. 4.8 %		5,922	9,857	14,979		4,902	7,740	12,642		3,933	3,835	7,768		52,279	63,305	115,584
L.C. 15.5 %														52,279	70,882	123,161
Total		9,296	12,191	21,487		7,567	10,379	17,946		5,973	4,328	10,301		85,748	105,375	191,123
		9,296	10,664	19,960		7,567	8,929	16,496		5,973	4,345	10,318		85,748	89,584	175,332

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	Total				1994				1995			
	X Million Rls		X Million Rls		X Million Rls		X Million Rls		X Million Rls		X Million Rls	
	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%
6. Amol East District(I)	0	0	0	0	0	0	0	0	0	0	0	0
I. Construction Cost	0	0	0	0	0	0	0	0	0	0	0	0
I.1. Storage Dam	86	129	215	0	86	129	215	0	86	129	215	0
I.2. Diversion Dam	794	845	1,639	0	794	845	1,639	0	794	845	1,639	0
I.3. Main Canal/Drain	794	696	1,490	0	794	696	1,490	0	794	696	1,490	0
Fereydon Kenal Drain	239	122	421	0	239	122	421	0	239	122	421	0
I.4. Secondary Canal	239	105	404	0	239	105	404	0	239	105	404	0
I.5. Tertiary Canal	1,265	1,413	2,678	0	1,265	1,413	2,678	0	1,265	1,413	2,678	0
I.6. Land Consolidation	331	578	909	0	331	578	909	0	331	578	909	0
I.7. River Training	30,365	4,834	35,199	0	30,365	4,834	35,199	0	30,365	4,834	35,199	0
I.8. O/M Road	146	82	228	0	146	82	228	0	146	82	228	0
I.9. Miscellaneous	257	13	270	0	257	13	270	0	257	13	270	0
- AE-I Sub-Total (I) -	13,543	8,036	21,579	0	13,543	8,036	21,579	0	13,543	8,036	21,579	0
2. Procurement of Equipment	2,728	284	3,012	0	2,728	284	3,012	0	2,728	284	3,012	0
3. Survey & Investigation	230	490	720	0	230	490	720	0	230	490	720	0
4. D.D. and Supervision	1,968	2,586	4,554	0	1,968	2,586	4,554	0	1,968	2,586	4,554	0
5. Building/Motor Pool	32	48	80	0	32	48	80	0	32	48	80	0
6. Land Acquisition and Compensation	0	1,240	1,240	0	0	1,240	1,240	0	0	1,240	1,240	0
7. O & M Equipment	380	40	420	0	380	40	420	0	380	40	420	0
8. Administration (% of I.) 5%	677	605	1,282	0	677	605	1,282	0	677	605	1,282	0
9. Physical Contingency 10% (% of I.)	877	354	1,231	0	877	354	1,231	0	877	354	1,231	0
- AE-I Total (I~9) -	20,892	13,979	34,871	0	20,892	13,979	34,871	0	20,892	13,979	34,871	0
10. Price Contingency	32,242	51,882	83,924	0	32,242	51,882	83,924	0	32,242	51,882	83,924	0
F.C. 4.8%	32,242	44,337	76,579	0	32,242	44,337	76,579	0	32,242	44,337	76,579	0
L.C. 15.5%	0	0	0	0	0	0	0	0	0	0	0	0
Total	53,134	66,861	119,995	0	53,134	66,861	119,995	0	53,134	66,861	119,995	0
	53,134	66,214	119,348	0	53,134	66,214	119,348	0	53,134	66,214	119,348	0

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Use	1986			1987			1988			1989		
	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rs	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rs	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rs	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rs
G. Anol East District (I)												
1. Construction Cost												
1.1. Storage Dam												
1.2. Diversion Dam	30	26	39	65	40	34	52	86	30	26	39	65
1.3. Main Canal/Drain		26	35	61	80	34	46	80	35	61	80	35
				10	19	79	85	164	15	119	127	246
				73	70	73	70	149	104	119	104	223
Fereydon Menal Drain												
1.4. Secondary Canal				10	127	141	127	268	15	190	212	402
1.5. Tertiary Canal				10	127	103	103	230	190	155	155	345
1.6. Land Consolidation					33	58	33	91	15	50	87	137
1.7. River Training					33	42	33	75	15	50	63	113
1.8. O/M Road					15	22	15	15	15	1,555	740	2,295
1.9. Miscellaneous					15	22	15	15	15	1,555	696	2,251
- AE-I Sub-Total (1) -		26	39	85	113	250	305	365	670	1,975	1,177	3,152
		26	35	61	113	229	305	284	589	1,975	1,029	3,004
2. Procurement of Equipment												
3. Survey & Investigation	50	115	245	360								
		115	196	311								
4. D.D. and Supervision				5	88	129	295	388	683	15	295	388
5. Building/Motor Pool	30	10	14	24	98	103	295	310	605	295	310	605
6. Land Acquisition and Compensation		10	11	21								
7. O & M Equipment				50	0	520	0	620	620			
8. Administration (% of 1.)	5%	1	2	3	6	7	15	16	33	99	59	158
9. Physical Contingency (% of 1.)	10%	1	2	3	6	6	12	14	29	99	51	150
- AE-I Total (1-9) -		155	304	459	228	807	2,010	1,560	3,570	3,931	1,874	5,805
10. Price Contingency		155	248	403	228	733	2,010	1,238	3,248	3,931	1,599	5,530
F.C. 4.8%		187	541	728	288	1,864	2,663	3,704	6,367	5,458	5,139	10,597
L.C. 15.5%		137	441	628	288	1,507	2,663	2,939	5,602	5,458	4,385	9,843
Total		342	845	1,187	516	2,771	4,673	5,264	9,937	9,389	7,013	16,402
		342	689	1,031	516	2,240	4,673	4,177	8,850	9,389	5,884	15,373

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2000				2001				2002				2003			
	x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs			
	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total
%	Eco.F.C.	Eco.L.C.	Eco.Total	%	Eco.F.C.	Eco.L.C.	Eco.Total	%	Eco.F.C.	Eco.L.C.	Eco.Total	%	Eco.F.C.	Eco.L.C.	Eco.Total	
9. Amol East District(I)																
1. Construction Cost	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.1. Storage Dam																
1.2. Diversion Dam																
1.3. Main Canal/Drain	15	119	127	246 15	119	127	246 15	119	127	127	246 15	119	127	104	223	246
Fereydon Kenal Drain																
1.4. Secondary Canal	15	190	212	402 15	190	212	402 15	190	212	180	365	190	212	150	303	402
1.5. Tertiary Canal	15	190	185	375	190	185	375	190	185	190	385	190	185	150	335	345
1.6. Land Consolidation	15	1,585	740	2,295 15	1,585	740	2,295 15	1,585	740	1,585	2,295 15	1,585	740	1,585	2,295	2,295
1.7. River Training	15	1,585	696	2,251	1,585	696	2,251	1,585	696	2,251	1,585	696	2,251	1,585	696	2,251
1.8. O/H Road	15	22	8	30	22	8	30	22	8	22	8	22	8	22	8	30
1.9. Miscellaneous	15	39	2	41 15	39	2	41 15	39	2	39	2	41 15	39	2	41	41
- AE-I Sub-Total (1) -		1,975	1,177	3,152	1,975	1,177	3,152	1,975	1,177	1,975	3,152	1,975	1,177	2,125	3,383	3,383
		1,975	1,029	3,004	1,975	1,029	3,004	1,975	1,029	1,975	3,004	1,975	1,029	2,125	3,207	3,207
2. Procurement of Equipment																
3. Survey & Investigation																
4. D.O. and Supervision	15	295	388	683 15	295	388	683 15	295	388	295	683 15	295	388	295	683	683
5. Building/Motor Pool																
6. Land Acquisition and Compensation																
7. O & M Equipment																
8. Administration (% of 1.)	5 %	99	59	158	99	59	158	99	59	99	158	99	59	106	62	163
9. Physical Contingency (% of 1.)	10 %	188	118	316	188	118	316	188	118	188	316	188	118	213	124	337
- AE-I Total (1-9) -		2,567	1,742	4,309	2,567	1,742	4,309	2,567	1,742	2,567	4,309	2,567	1,742	2,739	4,551	4,551
10. Price Contingency	F.C. 4.8 %	3,735	5,517	9,292	3,915	8,372	10,267	4,102	7,360	4,102	11,462	4,587	8,842	13,429	13,429	13,429
L.C. 15.5 %		3,735	4,728	8,463	3,915	5,461	9,376	4,102	6,308	4,102	10,410	4,587	7,583	12,170	12,170	12,170
Total																
		6,302	7,259	13,561	6,482	8,114	14,596	6,669	9,102	6,669	15,771	7,326	10,854	17,980	17,980	17,980
		6,302	6,221	12,523	6,482	6,954	13,436	6,669	7,801	6,669	14,470	7,326	9,137	16,463	16,463	16,463

TABLE E. 2. 2 - 14 ANNUAL DISBURSEMENT SCHEDULE BY SUB - DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2004				2005				2006				Total			
	* Million Rls		* Million Rls		* Million Rls		* Million Rls		* Million Rls		* Million Rls		* Million Rls		* Million Rls	
	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.
G. And East District(I)																
1. Construction Cost																
1.1. Storage Dam	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.2. Diversion Dam																
1.3. Main Canal/Drain																
Fereydon Kenal Drain	50	150	51	211												
1.4. Secondary Canal	15	150	53	203												
1.5. Tertiary Canal	15	190	212	402												
1.6. Land Consolidation	15	150	155	345												
1.7. River Training	15	50	97	137												
1.8. O/M Road	15	50	83	113												
1.9. Miscellaneous	15	1,595	740	2,295	10	1,037	493	1,530								
- AE - I Sub-Total (1) -	2,005	1,111	3,117	2,994	1,078	1,078	500	1,578	471	1,549	0	0	0	0	0	0
2. Procurement of Equipment																
3. Survey & Investigation																
4. D.D and Supervision	5	92	129	227												
5. Building/Motor Pool		98	103	201												
6. Land Acquisition and Compensation																
7. O & M Equipment	50	180	20	200	50	180	20	200								
8. Administration (% of 1.)	5%	180	16	196	180	180	16	196								
9. Physical Contingency (% of 1.)	10%	100	56	156	54	54	25	79								
- AE - I Total (1-9) -		2,585	1,244	3,829	1,420	1,420	558	1,978								
10. Price Contingency		4,537	8,043	12,580	2,612	2,612	3,873	6,485								
F.C. 4.8%		4,537	7,011	11,548	2,612	2,612	3,873	6,244								
L.C. 15.5%																
Total		7,122	9,470	16,592	4,032	4,032	4,468	8,500								
		7,122	8,255	15,377	4,032	4,190	8,222	8,222								

TABLE E. 2. 2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	1993				1994				1995			
	Total				Total				Total			
	Fin.F.C.	Fin.L.C.	Eco.L.C.	%	Fin.F.C.	Fin.L.C.	Eco.L.C.	%	Fin.F.C.	Fin.L.C.	Eco.L.C.	%
H. Amol East District (H)	0	0	0	0	0	0	0	0	0	0	0	0
I. Construction Cost	0	0	0	0	0	0	0	0	0	0	0	0
1.1. Storage Dam	107	161	268	0	107	161	268	0	107	161	268	0
1.2. Diversion Dam	107	145	252	0	107	145	252	0	107	145	252	0
1.3. Main Canal/Drain	928	1,037	1,965	0	928	1,037	1,965	0	928	1,037	1,965	0
Fereydun Kenal Drain	329	851	1,179	0	329	851	1,179	0	329	851	1,179	0
1.4. Secondary Canal	329	135	464	0	329	135	464	0	329	135	464	0
1.5. Tertiary Canal	1,544	794	2,298	0	1,544	794	2,298	0	1,544	794	2,298	0
1.6. Land Consolidation	1,544	612	2,156	0	1,544	612	2,156	0	1,544	612	2,156	0
1.7. River Training	377	461	838	0	377	461	838	0	377	461	838	0
1.8. O/H Road	12,203	5,753	17,956	0	12,203	5,753	17,956	0	12,203	5,753	17,956	0
1.9. Miscellaneous	181	78	259	0	181	78	259	0	181	78	259	0
- AE-II Sub-Total (I) -	15,996	8,572	24,568	0	15,996	8,572	24,568	0	15,996	8,572	24,568	0
2. Procurement of Equipment	3,410	330	3,740	0	3,410	330	3,740	0	3,410	330	3,740	0
3. Survey & Investigation	259	264	523	0	259	264	523	0	259	264	523	0
4. D.O. and Supervision	2,460	3,232	5,692	0	2,460	3,232	5,692	0	2,460	3,232	5,692	0
5. Building/Motor Pool	40	60	100	0	40	60	100	0	40	60	100	0
6. Land Acquisition and Compensation	0	1,395	1,395	0	0	1,395	1,395	0	0	1,395	1,395	0
7. O & M Equipment	405	45	450	0	405	45	450	0	405	45	450	0
8. Administration (% of I.)	800	429	1,229	5%	800	429	1,229	5%	800	429	1,229	5%
9. Physical Contingency (% of I.)	1,600	857	2,457	10%	1,600	857	2,457	10%	1,600	857	2,457	10%
- AE-II Total (I+9) -	24,970	15,471	40,441	0	24,970	15,471	40,441	0	24,970	15,471	40,441	0
10. Price Contingency	38,468	57,048	95,514	0	38,468	57,048	95,514	0	38,468	57,048	95,514	0
F.C. 4.8%	38,468	49,854	88,330	0	38,468	49,854	88,330	0	38,468	49,854	88,330	0
L.C. 15.5%	0	0	0	0	0	0	0	0	0	0	0	0
Total	63,436	72,519	135,955	0	63,436	72,519	135,955	0	63,436	72,519	135,955	0
	63,436	83,241	126,577	0	63,436	83,241	126,577	0	63,436	83,241	126,577	0

TABLE E. 2. 2 - 14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	1986				1987				1988				1989			
	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rls	Fin.L.C. Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rls	Fin.L.C. Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rls	Fin.L.C. Fin.Total %	Fin.F.C. %	Fin.L.C. %	Fin.Total x Million Rls	
H. Amol East District (H)																
1. Construction Cost																
1.1. Storage Dam	30	32	48	80.40	43	64	107.30	32	48	80	0	0	0	0	0	
1.2. Diversion Dam		32	44	76	43	58	101	32	44	76	0	0	0	0	0	
1.3. Main Canal/Drain				10	93	104	197.15	139	156	295.15	139	156	295.15	139	295	
Fereydon Kenal Drain				85	93	85	178	139	128	267	139	128	267	139	267	
1.4. Secondary Canal							10	154	75	229.15	232	113	345	232	345	
1.5. Tertiary Canal							10	154	61	215	232	92	324	232	324	
1.6. Land Consolidation								38	64	102.15	57	96	153	57	153	
1.7. River Training								38	46	84	57	69	126	57	126	
1.8. O/M Road											1,830	863	2,693	1,830	2,693	
1.9. Miscellaneous											1,830	817	2,647	1,830	2,647	
- AE-II Sub-Total (1) -		32	48	80	136	168	304	363	343	706	0	0	0	0	0	
2. Procurement of Equipment	50	32	44	76	136	143	279	369	279	642	2,334	1,243	3,577	2,334	3,577	
3. Survey & Investigation		180	276	405	123	162	285.15	369	485	854.15	1,705	185	1,870	1,705	1,870	
4. D.D. and Supervision		130	221	351	123	129	232	389	388	757	1,837	132	1,969	1,837	1,969	
5. Building/Motor Pool	30	12	18	30	123	129	232	389	388	757	1,837	132	1,969	1,837	1,969	
6. Land Acquisition and Compensation		12	14	26	0	698	698.50	0	698	698	0	0	0	698	698	
7. O & M Equipment					0	558	558	0	558	558	0	0	0	558	558	
8. Administration (% of 1.)	5%	2	2	4	7	8	15	18	17	35	117	62	179	117	179	
9. Physical Contingency (% of 1.)	10%	2	2	4	7	7	14	18	14	32	117	56	173	117	173	
- AE-II Total (1-9) -		3	5	8	14	17	31	36	34	70	233	124	357	233	357	
10. Price Contingency		3	4	7	14	14	28	36	28	64	233	112	345	233	345	
F.C. 4.8%		179	349	528	280	1,053	1,333	2,491	1,742	4,233	4,758	2,079	6,837	4,758	6,837	
L.C. 15.5%		179	285	464	280	851	1,131	2,491	1,399	3,890	4,758	1,808	6,566	4,758	6,566	
Total		216	521	837	354	2,184	2,518	3,300	4,136	7,436	6,806	5,701	12,507	6,806	12,507	
F.C. 4.8%		216	507	723	354	1,749	2,103	3,300	3,321	6,621	6,806	4,958	11,564	6,806	11,564	
L.C. 15.5%																
Total		395	970	1,365	634	3,217	3,651	5,791	5,878	11,669	11,364	7,780	19,144	11,364	19,144	
F.C. 4.8%		395	792	1,187	634	2,600	3,234	5,791	4,720	10,511	11,364	6,766	18,130	11,364	18,130	
L.C. 15.5%																

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2000				2001				2002				2003			
	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%
H. Abol East District (II)																
1. Construction Cost																
1.1. Storage Dam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.2. Diversion Dam																
1.3. Main Canal/Drain	139	156	295	15	139	156	295	15	139	156	295	15	139	156	295	15
Fereydon Kenal Drain	139	128	267		139	128	267		139	128	267		139	128	267	
1.4. Secondary Canal	232	113	345	15	232	113	345	15	232	113	345	15	232	113	345	15
1.5. Fertiarly Canal	57	92	149		57	92	149		57	92	149		57	92	149	
1.6. Land Consolidation	863	69	932	15	863	69	932	15	863	69	932	15	863	69	932	15
1.7. River Training	12	12	24		12	12	24		12	12	24		12	12	24	
1.8. O/N Road	49	3	52	15	49	3	52	15	49	3	52	15	49	3	52	15
1.9. Miscellaneous	0	0	0	15	0	0	0	15	0	0	0	15	0	0	0	15
- AE-II Sub-Total (I) -	2,334	1,243	3,577		2,334	1,243	3,577		2,334	1,243	3,577		2,334	1,243	3,577	
- AE-II Sub-Total (II) -	2,334	1,120	3,454		2,334	1,120	3,454		2,334	1,120	3,454		2,334	1,120	3,454	
2. Procurement of Equipment																
3. Survey & Investigation																
4. D.D. and Supervision	369	485	854	15	369	485	854	15	369	485	854	15	369	485	854	15
5. Building/Motor Pool	369	368	737		369	368	737		369	368	737		369	368	737	
6. Land Acquisition and Compensation																
7. O & M Equipment																
8. Administration (% of I.)	117	62	179	5%	117	62	179	5%	117	62	179	5%	117	62	179	5%
9. Physical Contingency (% of I.)	233	124	357	10%	233	124	357	10%	233	124	357	10%	233	124	357	10%
- AE-II-Total (1-9) -	3,053	1,914	4,967		3,053	1,914	4,967		3,053	1,914	4,967		3,053	1,914	4,967	
10. Price Contingency	4,442	6,962	11,404		4,442	6,962	11,404		4,442	6,962	11,404		4,442	6,962	11,404	
F.C. 4.8%	4,442	5,308	9,750		4,442	5,308	9,750		4,442	5,308	9,750		4,442	5,308	9,750	
L.C. 15.5%																
Total	7,495	7,976	15,471		7,495	7,976	15,471		7,495	7,976	15,471		7,495	7,976	15,471	
Total	7,495	6,984	14,479		7,495	6,984	14,479		7,495	6,984	14,479		7,495	6,984	14,479	

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2004				2005				2006				Total			
	x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs			
	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	
H. Amol East District(H)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1. Construction Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1.1. Storage Dam																
1.2. Diversion Dam																
1.3. Main Canal/Drain																
Fereydon Kenal Drain	165	68	233		165	233			165	233			165	233		
1.4. Secondary Canal	232	113	345		232	345			232	345			232	345		
1.5. Tertiary Canal	57	96	153		57	153			57	153			57	153		
1.6. Land Consolidation	1,830	863	2,693	10	1,830	2,693	10		1,830	2,693	10		1,830	2,693		
1.7. River Training	27	12	39	10	27	39	10		27	39	10		27	39		
1.8. O/M Road	49	3	52	10	49	52	10		49	52	10		49	52		
1.9. Miscellaneous	0	0	0	0	0	0	0		0	0	0		0	0		
- AE-II Sub-Total (1) -	2,360	1,155	3,515		2,360	3,515			2,360	3,515			2,360	3,515		
2. Procurement of Equipment																
3. Survey & Investigation																
4. D.D. and Supervision	123	162	285		123	285			123	285			123	285		
5. Building/Motor Pool																
6. Land Acquisition and Compensation																
7. O & M Equipment	203	23	226	50	203	226	50		203	226	50		203	226		
8. Administration (% of 1.)	118	58	176		118	176			118	176			118	176		
9. Physical Contingency (% of 1.)	236	115	351		236	351			236	351			236	351		
- AE-II Total (1-9) -	3,040	1,514	4,554		3,040	4,554			3,040	4,554			3,040	4,554		
10. Price Contingency	5,336	8,533	13,869		5,336	13,869			5,336	13,869			5,336	13,869		
F.C. 4.8 %	5,336	7,637	12,973		5,336	12,973			5,336	12,973			5,336	12,973		
L.C. 15.5 %																
Total	8,376	10,047	18,423		8,376	18,423			8,376	18,423			8,376	18,423		
	8,376	8,992	17,368		8,376	17,368			8,376	17,368			8,376	17,368		

TABLE E. 2. 2 - 14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	1993			1994			1995				
	Total X Million Ris			Total X Million Ris			Total X Million Ris				
	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.Total		
	Eco.F.C.	Eco.L.C.	Eco.Total	%	Eco.F.C.	Eco.L.C.	Eco.Total	%	Eco.F.C.	Eco.L.C.	Eco.Total
I. Abol East District(III)											
1. Construction Cost	0	0	0	0	0	0	0	0	0	0	0
1.1. Storage Dam	153	230	383								
1.2. Diversion Dam	159	207	366								
1.3. Main Canal/Drain	1,421	1,506	2,927								
Fereydon Renal Drain	1,421	1,239	2,660								
	586	220	786								
	538	190	728								
1.4. Secondary Canal	1,090	640	1,730								
1.5. Tertiary Canal	2,088	1,897	3,985								
	2,088	1,427	3,515								
1.6. Land Consolidation	21,211	13,821	35,032								
	21,211	12,986	34,197								
1.7. River Training	289	111	370								
	259	92	351								
1.8. O/H Road	368	19	387								
	368	32	400								
1.9. Miscellaneous	0	0	0								
- AE-III Sub-Total (1) -	27,136	18,444	45,582	0	0	0	0	0	0	0	0
	27,136	18,681	45,819								
2. Procurement of Equipment	4,433	429	4,862								
	4,433	343	4,776								
3. Survey & Investigation	432	918	1,350	50	215	459	675	50	215	459	675
	432	734	1,166		216	367	583		216	367	583
4. D.D. and Supervision	3,198	4,202	7,400								
	3,198	3,362	6,560								
5. Building/Motor Pool	52	78	130	20	10	16	26	20	10	16	26
	52	62	114		10	12	22		10	12	22
6. Land Acquisition and Compensation	0	2,325	2,325								
	0	1,860	1,860								
7. O & M Equipment	675	75	750								
	675	60	735								
8. Administration (% of 1.)	1,357	922	2,279								
	1,357	834	2,191								
9. Physical Contingency (% of 1.)	2,714	1,644	4,358								
	2,714	1,668	4,382								
- AE-III-Total (1~9) -	39,989	29,237	69,226		226	475	701		226	475	701
	39,989	25,604	65,603		226	379	605		226	388	614
10. Price Contingency	53,451	120,132	173,583		248	634	882		248	634	882
	53,451	106,577	160,028		248	506	754		248	506	754
F.C. 4.8 %											
L.C. 15.5 %											
Total	103,450	149,389	252,839	0	474	1,109	1,583	0	474	1,109	1,583
	103,450	132,181	235,631	0	474	885	1,359	0	474	885	1,359

TABLE E. 2. 2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Mark Description/Item	1996				1997				1998				1999				
	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	Fin.F.C.	Fin.L.C.	Fin.Total	%	
I. Asol East District(III)																	
1. Construction Cost																	
1.1. Storage Dam																	
1.2. Diversion Dam	30	45	69	115.40	61	92	153.30	46	69	115	115	69	109	160	269	109	
1.3. Main Canal/Drain		46	62	108.10	61	83	144	46	62	108	108	62	109	160	269	109	
Fereydon Kenal Drain					142	151	293.15	213	226	439.15	213	226	439	460	899	439	
1.4. Secondary Canal					142	124	266	213	186	399	213	186	399	460	899	439	
1.5. Tertiary Canal																	
1.6. Land Consolidation																	
1.7. River Training																	
1.8. O/M Road																	
1.9. Miscellaneous																	
- AE-III Sub-Total (1) -	46	89	115	203	243	445	688	578	549	1,127	578	549	1,127	1,675	2,802	1,127	
2. Procurement of Equipment	46	82	108	203	203	207	410	578	442	1,020	578	442	1,020	1,591	2,612	1,020	
3. Survey & Investigation																	
4. D.D. and Supervision																	
5. Building/Motor Pool	30	16	23	39	160	210	370.10	320	420	740.10	320	420	740.10	1,110	1,850	740.10	
6. Land Acquisition and Compensation		16	19	35	160	168	328	320	336	656	320	336	656	984	1,640	656	
7. O & M Equipment																	
8. Administration (% of 1.)	2	3	3	5	0	1,163	1,163.50	0	1,163	1,163	1,163	1,163	1,163	1,163	1,163	1,163	
9. Physical Contingency (% of 1.)	2	3	3	5	0	930	930	0	930	930	930	930	930	930	930	930	
- AE-III-Total (1-9) -	69	102	171	322	393	1,352	2,045	3,202	2,429	5,631	3,202	2,429	5,631	8,061	13,692	5,631	
10. Price Contingency	69	90	159	309	393	1,338	1,725	3,202	1,946	5,148	3,202	1,946	5,148	7,444	12,594	5,148	
F.C. 4.8%	83	182	265	497	497	3,996	3,996	4,242	5,767	10,009	4,242	5,767	10,009	14,776	24,785	10,009	
L.C. 15.5%	63	180	243	497	497	2,746	3,243	4,242	4,620	8,862	4,242	4,620	8,862	13,488	22,350	8,862	
Total	152	284	436	890	890	5,048	5,938	7,444	8,196	15,640	7,444	8,196	15,640	23,830	49,470	15,640	
	152	250	402	890	890	4,082	4,972	7,444	6,566	14,010	7,444	6,566	14,010	21,570	45,580	14,010	

TABLE E. 2. 2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB - DISTRICT - WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2000				2001				2002				2003			
	% Fin.F.C.		% Eco.L.C.		% Fin.F.C.		% Eco.L.C.		% Fin.F.C.		% Eco.L.C.		% Fin.F.C.		% Eco.L.C.	
	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total	Fin.F.C.	Fin.L.C.	Fin.L.C.	Fin.Total
1. Amol East District(III)																
1. Construction Cost																
1.1. Storage Dam	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.2. Diversion Dam																
1.3. Main Canal/Drain	15	213	226	439	213	226	439	213	226	439	213	226	439	213	226	439
Fereydon Keshal Drain		213	186	399	213	186	399	213	186	399	213	186	399	213	186	399
1.4. Secondary Canal	15	164	96	260	164	96	260	164	96	260	164	96	260	164	96	260
1.5. Tertiary Canal	15	164	75	240	164	75	240	164	75	240	164	75	240	164	75	240
1.6. Land Consolidation	10	315	285	600	315	285	600	315	285	600	315	285	600	315	285	600
1.7. River Training	10	315	214	529	315	214	529	315	214	529	315	214	529	315	214	529
1.8. O/M Road	10	2,121	1,299	3,420	3,182	2,073	5,255	3,182	2,073	5,255	3,182	2,073	5,255	3,182	2,073	5,255
1.9. Miscellaneous	10	2,121	1,299	3,420	3,182	1,948	5,130	3,182	1,948	5,130	3,182	1,948	5,130	3,182	1,948	5,130
- AE-III Sub-Total (1) -		2,876	2,002	4,878	3,968	2,700	6,668	3,968	2,700	6,668	3,968	2,700	6,668	3,968	2,700	6,668
2. Procurement of Equipment		2,876	1,787	4,663	3,968	2,443	6,411	3,968	2,443	6,411	3,968	2,443	6,411	3,968	2,443	6,411
3. Survey & Investigation		480	530	1,110	480	530	1,110	480	530	1,110	480	530	1,110	480	530	1,110
4. D.D. and Supervision		480	504	984	480	504	984	480	504	984	480	504	984	480	504	984
5. Building/Motor Pool																
6. Land Acquisition and Compensation																
7. O & M Equipment																
8. Administration (% of 1.)	5%	144	100	244	198	135	333	198	135	333	198	135	333	198	135	333
9. Physical Contingency (% of 1.)	10%	144	89	233	198	122	320	198	122	320	198	122	320	198	122	320
- AE-III-Total (1-9) -		288	200	488	397	270	667	397	270	667	397	270	667	397	270	667
10. Price Contingency	F.C. 4.8%	3,788	2,532	6,320	5,043	3,735	8,778	5,043	3,735	8,778	5,043	3,735	8,778	5,043	3,735	8,778
	L.C. 15.5%	3,788	2,559	6,347	5,043	3,313	8,356	5,043	3,313	8,356	5,043	3,313	8,356	5,043	3,313	8,356
Total		5,512	9,286	14,798	7,890	13,662	21,352	8,059	15,780	23,839	8,059	15,780	23,839	8,059	15,780	23,839
		5,512	8,104	13,616	7,890	12,119	19,809	8,059	13,997	22,056	8,059	13,997	22,056	8,059	13,997	22,056
		9,300	12,216	21,516	12,733	17,397	30,130	13,102	19,515	32,617	13,102	19,515	32,617	13,102	19,515	32,617
		9,300	10,853	19,983	12,733	15,432	28,165	13,102	17,310	30,412	13,102	17,310	30,412	13,102	17,310	30,412

TABLE E.2.2-14 ANNUAL DISBURSEMENT SCHEDULE BY SUB-DISTRICT-WISE (WITHOUT MANGOL DAM CASE)

Work Description/Item	2004				2005				2006				Total			
	x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs		x Million Rs			
	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.	Fin.F.C.	Fin.L.C.		
I. Abol East District(III)																
1. Construction Cost																
1.1. Storage Dam	10	0	0	0	0	0	0	0	0	0	0	0	0	0		
1.2. Diversion Dam																
1.3. Main Canal/Drain																
Fareydon Kenal Drain	50	269	110	379	269	110	379	269	110	379	269	110	379	269		
1.4. Secondary Canal	10	109	64	173	109	64	173	109	64	173	109	64	173	109		
1.5. Tertiary Canal	10	210	190	400	210	190	400	210	190	400	210	190	400	210		
1.6. Land Consolidation	15	3,182	2,073	5,255	2,121	1,382	3,503	2,121	1,382	3,503	2,121	1,382	3,503	2,121		
1.7. River Training	15	3,182	1,948	5,130	2,121	1,299	3,420	2,121	1,299	3,420	2,121	1,299	3,420	2,121		
1.8. O/M Road	15	39	14	53	26	11	37	26	11	37	26	11	37	26		
1.9. Miscellaneous	15	55	5	60	37	3	40	37	3	40	37	3	40	37		
- AF-III Sub-Total (I) -		3,864	2,457	6,321	2,503	1,649	4,152	2,184	1,395	3,578	2,184	1,395	3,578	2,184		
2. Procurement of Equipment		3,864	2,256	6,120	2,503	1,505	4,008	2,184	1,311	3,495	2,184	1,311	3,495	2,184		
3. Survey & Investigation																
4. D.D. and Supervision	10	320	420	740	160	210	370	160	210	370	160	210	370	160		
5. Building/Motor Pool		320	338	658	160	168	328	160	168	328	160	168	328	160		
6. Land Acquisition and Compensation																
7. O & M Equipment				50	338	38	376	338	38	376	338	38	376	338		
8. Administration (% of 1.)	5%	192	123	316	125	82	207	109	70	179	109	70	179	109		
9. Physical Contingency (% of 1.)	10%	386	246	632	246	155	401	246	155	401	246	155	401	246		
- AF-III-Total (1-9) -		4,763	3,246	8,009	3,376	2,144	5,520	2,849	1,643	4,492	2,849	1,643	4,492	2,849		
10. Price Contingency		4,763	2,931	7,694	3,376	1,929	5,305	2,849	1,538	4,387	2,849	1,538	4,387	2,849		
F.C. 4.8%		8,360	18,295	26,655	6,210	13,957	20,167	5,492	12,353	17,845	63,451	120,132	183,583	265,644		
L.C. 15.5%		8,360	16,520	24,880	6,210	12,857	19,067	5,492	11,564	17,056	63,451	106,577	170,028	235,644		
Total		13,123	21,541	34,664	9,586	16,101	25,667	6,341	13,996	22,337	103,459	149,377	252,836	395,644		
		13,123	19,451	32,574	9,586	14,486	24,072	6,341	13,102	21,443	103,459	132,185	235,644	395,644		

E. 3 Project Evaluation

The procedure for Project Evaluation was mentioned in the main report. Here, the materials, process of calculation for the evaluation were given in tables, the titles of which are listed below:

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Table E.3.1-1 Recent Trends in Currency Exchange rate Between US\$ and Rial

Year	Month	Basic Rate	Year	Month	Basic Rate	Competitive rate	Floating rate
1985	MAR.	93.54	1989	MAR	71.10	1989 MAR	1,000.0
	APR.	93.32		APR	71.74	APR	-
	MAY	92.81		MAY	74.36	MAY	-
	JUN.	91.52		JUN	73.22	JUN	-
	JUL.	89.57		JUL	72.81	JUL	-
	AUG.	90.11		AUG	74.31	AUG	-
	SEPT.	86.98		SEP	72.86	SEP	-
	OCT.	86.05		OCT	72.40	OCT	-
	NOV.	84.81		NOV	71.47	NOV	-
	DEC.	84.40		DEC	71.10	DEC	900.0
1985	Average	88.05	1989	Average	72.00	1989 Average	-
1986	JAN.	83.14	1990	JAN	69.75	1990 JAN	-
	FEB.	80.33		FEB	70.35	FEB	-
	MAR.	81.12		MAR	-	MAR	-
	APR.	78.59		APR	-	APR	-
	MAY	79.59		MAY	-	MAY	-
	JUN.	78.30		JUN	68.25	JUN	870.0
	JUL.	76.78		JUL	-	JUL	-
	AUG.	76.17		AUG	-	AUG	-
	SEPT.	76.02		SEPT.	-	SEP	-
	OCT.	77.11		OCT	-	OCT	-
	NOV.	76.75		NOV	67.10	NOV	800.0
	DEC.	75.20		DEC	-	DEC	-
1986	Average	76.18	1990	Average	-	1990 Average	-
1987	JAN.	73.10	1991	JAN	-	1991 JAN	-
	FEB.	73.07		FEB	-	FEB	-
	MAR.	71.80		MAR	68.17	MAR	700.0
	APR.	70.73		APR	-	APR	-
	MAY	71.39		MAY	-	MAY	-
	JUN.	72.44		JUN	-	JUN	-
	JUL.	73.12		JUL	-	JUL	-
	AUG.	71.42		AUG	66.82	AUG	600.0
	SEPT.	71.68		SEPT.	-	SEP	-
	OCT.	69.34		OCT	-	OCT	-
	NOV.	67.42		NOV	-	NOV	-
	DEC.	66.29		DEC	65.75	DEC	-
1987	Average	70.10	1991	Average	-	1991 Average	-
1989	JAN.	67.83	1992	JAN	64.85	1992 JAN	592.2
	FEB.	67.71		FEB	66.24	FEB	592.2
	MAR.	66.82		MAR	-	MAR	592.2
	APR.	66.85		APR	-	APR	592.2
	MAY	67.70		MAY	71.06	MAY	592.2
	JUN.	70.41		JUN	-	JUN	592.2
	JUL.	71.13		JUL	-	JUL	592.2
	AUG.	71.33		AUG	62.76	AUG	592.2
	SEPT.	70.78		SEP	74.77	SEP	592.2
	OCT.	68.58		OCT	64.12	OCT	592.2
	NOV.	68.69		NOV	66.15	NOV	592.2
	DEC.	69.08		DEC	66.70	DEC	592.2
1989	Average	69.23	1992	Average	-	1992 Average	592.2
1989	JAN.	70.18					
	FEB.	70.19					

source : Annual Statistics by Central Bank

Table E.3.1-2 Shadow Exchange Rate for Shadow Price

Item	Mean Value 1985 -1989	Average % Custom Duty (x)	Share in Trade Value	unit : million Rial	
				Rate of Composition (y)	Weighted Average (xy)
<u>Major Imports</u>					
vehicles/parts	54,812	182.0		12.2%	22.3%
machinery	171,630	27.0		38.3%	10.4%
plastic material	91,999	20.0		20.5%	4.1%
cereals/flour	50,839	15.0		11.4%	1.7%
steel material	78,435	19.0		17.5%	3.3%
<u>Sum of the above</u>	447,715	-	34.9%	100.0%	41.8%
<u>Major Exports</u>					
oil/oil products	825,793	0.0		99.0%	0.0%
carpets	4,269	-10.0		0.5%	-0.1%
fruit/nuts	3,855	-5.0		0.5%	0.0%
<u>Sum of the above</u>	833,917	-	65.1%	100.0%	-0.1%

$$\begin{aligned} \text{Shadow Exchange Rate} &= \text{Sum of Trade Share} \times \text{Weighted Duty Rate} \\ &= 34.9 \times 0.418 - 65.1 \times (-0.001) = 14.6\% \end{aligned}$$

When the rate is applied to the exchange rate for capital goods for production, or 600 Rial/US\$, the undistorted rate will be given as :

$$600 \text{ Rial/US\$} \times (100 + 14.6)/100 = 687.6 \text{ Rial/US\$}$$

Table E.3.1-3 Standard Conversion Factor of the Project

Trade Item	1985	1986	1987	1988	unit : million Rial	
					1989	Average
Total Exports (1)	1,205,075	521,883	873,598	744,567	1,122,121	893,449
Total Imports (2)	1,058,345	720,700	658,900	567,923	927,257	786,625
Import Taxes (3)	250,000	195,000	152,900	107,200	160,900	173,200
Export Subsidy(4)	264	264	264	264	264	264
Export Taxes (5)	0	0	0	0	0	0

$$\text{S.C.F.} = \{(1)+(2)\} / \{(1)+(2)+(3)+(4)-(5)\} = 0.906$$

Table E.3.1-4 Other Conversion Factors of the Project

(1) Conversion Factor for Un-Skilled Labor

- Basic Situations : (1) Estimated Agricultural Labor Available in the Project
52,086 (labor force, mainly male covers 1.58 ha/man)
(2) Estimated Agricultural Share in Total Labor
Opportunities 44.2 % x (100 - 9.8)/100
= 39.9 % Estimated Unemployment Rate : 9.8 %
(3) Suppliable family labor is estimated as 1/1.58 ha
x 17.5 mandays / month = 11.1 days/month/ha.

Monthly Distribution of Farm Labor Supply/Demand in the Project Area

Month	Crop	Project Labor Availability	Labor Supplied			Demand	
			Family	L. Labor	Hired Labor	Seasonal Labor Wage	Hired Labor Cost
JAN	UPLAND CROP	11.1	1.0	1.0	0.0	7,729	0
FEB	D.O.	11.1	2.6	2.6	0.0	7,729	0
MAR	D.O.	11.1	4.5	4.5	0.0	8,310	0
APR	PADDY	11.1	11.5	6.5	5.0	8,310	41,550
MAY	D.O.	11.0	14.7	8.8	5.9	9,660	56,994
JUN	D.O.	11.1	3.9	3.9	0.0	8,310	0
JUL	D.O.	11.1	8.1	4.1	4.0	8,310	33,240
AUG	D.O.	11.0	19.8	7.2	12.6	10,240	129,024
SEPT	D.O.	11.1	11.8	5.5	6.3	9,050	57,015
OCT	UPLAND CROP	11.1	3.0	3.0	0.0	8,310	0
NOV	D.O.	11.1	2.5	2.5	0.0	7,729	0
DEC	D.O.	11.1	2.0	2.0	0.0	7,729	0
						average	
Total PADDY+UPLAND		133.0	85.4	51.6	33.8	8,451	317,823

Labor cost Ratio (hired wage/family wage) = $317,823 / (33.8 \times 8451) = 1.11$
 Conversion Factor for Unskilled Labor = $33.8 / (133.0 - 51.6) \times \text{S.C.F.}$
 $= 0.415 \times 0.906 = 0.376$

Note : Hired labor available within the project area estimated at 0.23/ha/day
of which 0.09 can be presently absorbed. (around 40 % of active supply)

(2) Conversion Factor of Skilled Labor

Skilled labor in the project area is much less available than unskilled, so the conversion factor thereof can be equal to that of consumer's goods, for which S.C.F. can be applied to, i.e., 0.906.

(3) Conversion Factor of Fuels

Domestic prices of fuel in oil producing countries are generally subsidized thus an adjusting factor should be applied to currently prevailing prices to make them in conformity with other economic ones. Generally speaking, OPEC reference price levels are employed as crude oil equivalent. Exchange rate of fuel/fuel products has been set at around 69 Rial/US\$ instead of 600, but in this calculation 600 Rial/US\$ is applied to unify the base of exchange, 1985-1989 5-year average price for OPEC arabian light = 20.6 \$/barrel(159ltr) imaginative kerosene price : $20.6 \times 600 / 159 / 0.2$ (extraction rate + processing cost) = 389 Rial/litre market price = 50 Rial / litre, subsidized farmer's price = 15 Rial / l, $389 / 50 = 7.77$ or 7.8 So, the conversion factor is given as 7.8.

Table E.3.2.1 Recent Farm-Gate Price Rewcords in the Project area
unit: Rial

YEAR/MONTH	TAROMRICE	KHAZAR	HARAZRICE	TAROMASGRI	AMOL-3	WHEAT	BARLEY
1991 AUG	855	656	650	607	580	160	115
SEPT	841	640	670	535	533	160	115
OCT	920	653	590	535	510	160	115
NOV	893	640	580	562	503	160	115
DEC	915	685	605	620	490	160	115
1992 JAN	982	707	590	640	509	185	115
FEB	1,134	840	640	735	558	185	135
MAR	1,209	920	675	825	580	185	135
APR	1,233	1,030	758	783	640	185	135
MAY	1,363	1,118	860	937	685	160	105
JUN	1,263	1,125	860	947	700	160	107
JUL	1,080	950	800	920	680	160	110
an' average	1,057	830	690	721	581	168	118
<u>PADDY-</u> <u>EQUIVALENT</u>	<u>661</u>	<u>519</u>	<u>431</u>	<u>450</u>	<u>363</u>	-	-

YEAR/MONTH	LETTUCE	CUCUMBER	BROADBEAN	DRY B.BEAN	GARLIC	COWS MEAT	COWS MILK
1991 AUG	-	150	-	320	300	2,300	150
SEPT	-	185	-	320	350	2,300	150
OCT	-	300	-	320	550	2,350	150
NOV	-	300	-	320	600	2,400	150
DEC	-	-	-	320	600	2,650	150
1992 JAN	-	-	-	320	600	2,900	170
FEB	100	900	-	320	600	3,300	170
MAR	70	600	-	320	600	3,450	170
APR	90	400	-	320	375	3,450	200
MAY	-	250	100	320	225	3,670	200
JUN	-	180	120	320	225	3,670	200
JUL	-	125	-	320	200	3,700	200
an' average	87	633	110	320	525	3,400	180

Table E.3.2-2 Ocean Freight, Port Charge and Inland Transport

Route; Tokyo - Bandarkhomeini - via Tehran to Amol, Mazendaran
Condition; C and F, insurance is negligible and omitted.

Cargo	Cargo-Volume/Unit		Freight 1,000 Rial	Cargo Value million Rial	Freight/cub. meter	
	cubic meter	m. ton			per ton	per volume 1,000 Rial
Bulldozer	41.6	16.8	5,345	145	318.2	128.5
Bulldozer	44.6	22.6	6,130	220	271.2	137.4
Back-hoe	35.5	13.0	4,360	85	335.4	122.8
Motor Grader	58.9	13.2	7,235	120	548.1	122.8
Dump Truck	49.9	16.4	6,410	51	390.9	128.5
Belt Conveyer	6.2	2.4	660	4	275.0	106.5

in the above calculation, exchange rates are assumed as 120yen=1US\$=600Rial

Cargo unit :	Cargo-Volume/Unit cubic meter	m. ton	Loading	Storing	Other Port	Handling Cost/ton
			Services	Demurrage	Charges	
Heavy Machinery	139.9	58.7	108.1	15.9	2.7	2.16
Light Machinery	423.9	19.7	36.6	5.4	0.9	2.18

after landing, inland transportation incurs the following charges ;

Item of Charge	Basic Fee per ton 1,000 Rial	Hire Charge of Trailer d.o. trailer/day	Storage Cost/ton d.o.	Transport Period day	Demurrage Cost/ton 1,000 Rial	Surcharge Heavy Cargo d.o. per day
Inland Transport	20	720	29	80 - 120	29	1,300

Calculated Transport Charge (Ocean Freight + Inland Transportation)

Measurement Cargo Basis

Case 1 Heavy Machinery	Freight/cubic meter	127.9				
	Handling/ cubic m.	0.9				
	Inland T./cubic m.	47.7	Total/m3			176.5

Case 2 Other Machinery	Freight/cubic meter	117.5				
	Handling/ cubic m.	0.1				
	Inland T./cubic m.	8.2	Total/m3			125.8

Loading Weight Basis

Case 1 Heavy Machinery	Freight / meter ton	359.8				
	Handling/ meter ton	2.0				
	Inland T./meter ton	128.7	Total/t			490.5

Case 2 Other Machinery	Freight / meter ton	275.0				
	Handling/ meter ton	0.3				
	Inland T./meter ton	107.0	Total/t			382.3

Case 3 Grain, Fertilizer	Freight / meter ton	128.4				
	Inland T./meter ton	41.0	Total/t			169.4

Table E.3.2-3 Estimated Economic Prices

Items/Products	Base of Estimation	exchange rate : 600 Rial/US\$ unit : Rial			
		World Market Price	Economic Price	Financial Price	Conversion Factor / Unit
Rice Basmate	World Market 2000	265	434	1057	0.411 /kg
Rice Local H.Q.	+ transport	255	424	830	0.511 /kg
Rice HYV	= border price	244	413	581	0.711 /kg
Paddy Tarom	d.o. converted	166	271	661	0.410 /kg
Paddy Khazar	by milling rate	159	265	519	0.511 /kg
Paddy Amol-3	for each case	153	253	363	0.711 /kg
Berseem Hay	World Market derived	81	156	81	1.926 /kg
Berseem Raw	of Alfalfa	22	41	22	1.864 /kg
Winter Vegetable	-	-	-	110	-
Broadbean Dry	World Market derived	657	735	320	2.297 /kg
Broadbean Raw	border price	173	251	110	2.282 /kg
Barley Threshed	World Market derived	36	55	74	0.743 /kg
Fertilizer N	World Market derived	201	320	41	7.805 /kg
Fertilizer P	+ transport	529	648	72	9.000 /kg
Fertilizer K	= border price	168	287	50	5.740 /kg
Kerosene	OPEC price based estimation	339	389	50	7.780 ltr
Farm Labor Wage (annual average)	conversion factor	-	3,178	8,451	0.376 m-d
Tractor 65HP	Japanese Market border price	43594300	47682716	49480300	0.964 set
Paddy Straw	-	-	45	50	- /kg

Table E.3.2-4 Estimated Economic Production Cost of Rice

MACHINERY COST	SURVEY RESULTS				by economic cost		
	FOR HYV	FOR LOCAL	C.F.	FOR HYV	FOR LOCAL		
plowing	73.8	73.8	73.8	0.838	61.8	61.8	
puddling	17.2	17.2	17.2	0.838	14.4	14.4	
spraying	7.8	10.1	5.5	0.838	8.5	4.6	
collecting	13.6	17.0	10.2	0.838	14.2	8.5	
threshing	94.8	118.5	71.1	0.838	99.3	59.6	
TOTAL COST OF MACHINERY	207.2	236.6	177.8	0.838	198.3	149.0	
MANUAL LABOR COST							
plowing	18.5	18.5	18.5	0.376	7.0	7.0	
bunding	21.4	21.4	21.4	0.376	8.1	8.1	
puddling	5.6	5.6	5.6	0.376	2.1	2.1	
nursery	39.7	39.7	39.7	0.376	14.9	14.9	
planting	103.9	103.9	103.9	0.376	39.1	39.1	
manuring	6.2	8.4	4.0	0.376	3.2	1.5	
irrigation	34.4	34.4	34.4	0.376	12.9	12.9	
spraying	7.5	9.4	5.6	0.376	3.5	2.1	
weeding	71.2	71.2	71.2	0.376	26.8	26.8	
harvesting	115.5	144.4	86.6	0.376	54.3	32.6	
collecting	43.9	54.9	46.3	0.376	20.6	17.4	
threshing	40.9	51.1	30.7	0.376	19.2	11.5	
canalalign	11.6	11.6	11.6	0.376	4.4	4.4	
TOTAL COST OF FARM LABOR	520.2	574.5	479.5	0.376	216.0	180.3	
FARM INPUT							
paddy seed	25.8	18.4	33.2	0.906	16.7	30.1	
fertilizers	12.0	15.6	8.4	0.981	15.3	8.2	
chemicals	10.3	12.9	7.7	1.000	12.9	7.7	
herbicides	4.2	4.2	4.2	1.000	4.2	4.2	
water fee	30.5	30.5	30.5	0.482	14.7	14.7	
TOTAL COST OF FARM INPUT MATERIALS	82.8	81.6	84.0		63.8	65.0	
<u>TOTAL COST PER ha</u>	<u>810.2</u>	<u>892.7</u>	<u>741.3</u>		<u>478.1</u>	<u>394.2</u>	

Estimated Economic Prices of Rice

PRODUCTS	FARM-GATE	P./kg 1992	WORLD P.	FREIGHT	INLAND T	BORDERPRICE	C. FACTOR
rice HYV	581	222	78	41	341	0.587	
rice KHAZAR	830	234	78	41	353	0.425	
rice local	1,057	243	78	41	362	0.342	
paddy HYV	363	139	78	41	258	0.711	
paddy KHAZAR	519	146	78	41	265	0.511	
paddy local	661	152	78	41	271	0.410	
paddy straw	5	0	0	0	0	-	

Table E.3.2-5 List of Financial and Economic Prices

Item	unit	Price		Item	unit	Price	
		Economic	Financial			Economic	Financial
<u>Agricultural Commodities</u>				<u>Agricultural Inputs (2)</u>			
Rice Tarom	kg	434	1057	Kerosene	l	389	50
Khaza	kg	424	830	Diesel	l	115	15
Amol-	kg	413	581	Feed Meal	kg		180
Paddy Taro	kg	271	661	Wheat Bran	kg		60
Khaza	kg	265	519	<u>Agricultural Machinery</u>			
Amol-	kg	258	363	Combine J.	1000	25,140	30,000
Rice Straw	kg	45	50	Combine W.	1000	19,274	23,000
Raw Bersee	kg	41	22	Thresher S	1000	268	320
Dry Bersee	kg	156	81	Thresher L	1000	302	360
Raw Lettuc	kg	89	89	Tractor Ro	1000	4,693	5,600
Raw Radish	kg	110	110	Tractor FG	1000	5,866	7,000
Garlic	kg	435	435	Tractor JD	1000	11,732	14,000
Raw Bean	kg	115	115	Powertille	1000	1,215	1,450
Dry Bean	kg	735	320	P.Tiller K	1000	2,472	2,950
Barley	kg	55	74	Sprayer 20	1000	151	180
Wheat	kg	167	168	Trailer 5t	1000	1,048	1,250
<u>Agricultural Inputs (1)</u>				Combine 2m	1000	41,934	41,934
Fertilizer	kg	320	41	Tractor65H	1000	40,366	43,098
Fertilizer	kg	648	72	Trs' plante	1000	11,332	11,332
Fertilizer	kg	287	50	<u>Agricultural Labor</u>			
Urea	kg	110	14	Plowing	man-	2,200	5,851
D.A.P.	kg	135	15	Bunding	man-	3,068	8,159
Potash	kg	150	25	Puddling	man-	2,569	6,832
Manure	kg	7	7	Nursery	man-	2,428	6,457
Macheti HD	kg	*****	2,000	Manuring	man-	3,505	9,321
Ronstar HD	kg	*****	2,200	Tr' plantin	man-	2,844	7,564
Satern HD	kg	*****	1,800	Weeding	man-	2,133	5,672
Dimecron	kg	*****	1,800	Spraying	man-	2,942	7,825
Diazinon	kg	*****	1,400	Harvesting	man-	3,954	10,515
Hinozan	kg	*****	2,750	Carrying	man-	4,028	10,712
Vitafax	kg	*****	2,000	Threshing	man-	3,752	9,980
Vegeta' see	kg	*****	35,000	<u>Other Costs</u>			
HYV seed	kg	*****	1,300	Water Fee	Rial	0	30,500

Table E.3.3-1 Estimated Financial Crop Benefits of the Project

Crop	(1) Stage	Comparison of Gross Income from Crops				
		Crop Area (ha)	Yield (kg/ha)	Production (ton)	Unit Price (Rial/kg)	Gross V. million R
Tarom Paddy	W.O.P.	35,185	4,135	145,490	661	96,169
	W. P.	28,494	4,437	126,428	661	83,569
Khazar	W.O.P.	32,275	5,741	185,291	519	96,166
	W. P.	28,494	6,378	181,735	519	94,320
Amol-3	W.O.P.	12,509	7,375	92,254	363	33,488
	W. P.	18,997	7,972	151,444	363	54,974
Barley	W.O.P.	330	3,000	990	74	73
	W. P.	0	3,000	0	74	0
Berseem	W.O.P.	5,450	52,500	286,125	22	6,295
	W. P.	37,993	60,000	2,279,580	22	50,151
Broadbean	W.O.P.	190	2,500	475	110	52
	W. P.	330	2,500	825	110	91
Vegetables	W.O.P.	3,650	22,500	82,125	105	8,623
	W. P.	6,290	22,500	141,525	105	14,860
Total	W.O.P.	89,589	-	-	-	240,866
	W. P.	120,598	-	-	-	297,965
	Difference	31,009				57,099

Crop	(2) Stage	Comparison of Net Income from Crops				
		Cost/ha 1992 (million Rial)	Cost/ha Total Cost	Gross Value	Net Income project area	
Tarom Paddy	W.O.P.	0.7413	0.8606	30,282	96,169	65,887
	W. P.	0.7232	0.8396	23,925	83,569	59,644
Khazar	W.O.P.	0.8927	1.0364	33,451	96,166	62,715
	W. P.	0.7802	0.9058	25,810	94,320	68,510
Amol-3	W.O.P.	0.8927	1.0364	12,965	33,488	20,523
	W. P.	0.7802	0.9058	17,208	54,974	37,766
Barley	W.O.P.	0.1726	0.2004	66	73	7
	W. P.	-	-	0	0	0
Berseem	W.O.P.	0.2526	0.2933	1,598	6,295	4,697
	W. P.	0.2726	0.3165	12,024	50,151	38,127
Broadbean	W.O.P.	0.1726	0.2004	38	52	14
	W. P.	0.1576	0.1830	60	91	31
Vegetables	W.O.P.	1.1120	1.2910	4,712	8,623	3,911
	W. P.	0.8306	0.9643	6,066	14,860	8,794
Total	W.O.P.	-	-	83,112	240,866	157,754
	W. P.	-	-	85,093	297,965	212,872
	Difference			1,981	57,099	55,118

Note: Berseem yield and production are expressed in flesh-grass basis.

Table E.3.3-1(contd) Estimated Economic Crop Benefits in the Project

Crop	(1) Stage	Comparison of Gross Income from Crops				
		Crop Area (ha)	Yield (kg/ha)	Production (ton)	Unit Price (Rial/kg)	Gross V. million R
Tarom Paddy	W.O.P.	35,185	4,135	145,490	271	39,428
	W. P.	28,494	4,437	126,428	271	34,262
Khazar	W.O.P.	32,275	5,741	185,291	265	49,102
	W. P.	28,494	6,378	181,735	265	48,160
Amol-3	W.O.P.	12,509	7,375	92,254	258	23,801
	W. P.	18,997	7,972	151,444	258	39,073
Barley	W.O.P.	330	3,000	990	55	54
	W. P.	0	3,000	0	55	0
Berseem	W.O.P.	5,450	52,500	286,125	41	11,731
	W. P.	37,993	60,000	2,279,580	41	93,463
Broadbean	W.O.P.	190	2,500	475	251	119
	W. P.	330	2,500	825	251	207
Vegetables	W.O.P.	3,650	22,500	82,125	105	8,623
	W. P.	6,290	22,500	141,525	105	14,860
Total	W.O.P.	89,589	-	-	-	132,859
	W. P.	120,598	-	-	-	230,024
	Difference	31,009	-	-	-	97,165

Crop	(2) Stage	Comparison of Net Income from Crops				
		Cost/ha 1992 (million Rial)	Cost/ha	Total Cost	Gross Value	Net Income project area
Tarom Paddy	W.O.P.	0.3942	0.4577	16,103	39,428	23,325
	W. P.	0.6259	0.7267	20,706	34,262	13,556
Khazar	W.O.P.	0.4781	0.5551	17,915	49,102	31,187
	W. P.	0.6829	0.7928	22,591	48,160	25,569
Amol-3	W.O.P.	0.4781	0.5551	6,943	23,801	16,858
	W. P.	0.6829	0.7928	15,062	39,073	24,011
Barley	W.O.P.	0.0534	0.0620	20	54	34
	W. P.	-	0	0	0	0
Berseem	W.O.P.	0.1358	0.1577	859	11,731	10,872
	W. P.	0.2408	0.2796	10,622	93,463	82,841
Broadbean	W.O.P.	0.1504	0.1746	33	119	86
	W. P.	0.1364	0.1584	52	207	155
Vegetables	W.O.P.	0.7228	0.8392	3,063	8,623	5,560
	W. P.	0.5976	0.6938	4,364	14,860	10,496
Total	W.O.P.	-	-	44,937	132,859	87,921
	W. P.	-	-	73,397	230,024	156,628
	Difference	-	-	28,460	97,165	68,707

Table E.3.3.2 Financial/Economic Costs of the Project
as Corresponded with Benefits

A. WITHOUT MANGOL DAM BASIS (including O and M costs)

YEAR	1. Financial Basis Cost/Benefit Flow Pattern			2. Economic Basis Cost/Benefit Flow Pattern		
	TOTAL COST	L.C.COST	BENEFIT	TOTAL COST	L.C.COST	BENEFIT
1994	10,445	0	0	9,292	0	0
1995	9,165	0	0	7,760	0	0
1996	21,735	0	0	19,517	0	0
1997	36,782	9,229	0	33,885	9,091	0
1998	49,201	10,870	2,425	45,249	10,704	3,023
1999	65,473	26,614	5,291	61,968	26,254	6,596
2000	56,992	28,663	12,346	53,738	28,259	15,391
2001	56,148	31,360	19,898	53,220	30,928	24,803
2002	52,343	31,437	18,766	49,982	30,908	35,110
2003	48,276	28,505	36,433	46,247	28,041	45,415
2004	37,440	23,734	43,929	35,982	23,295	54,759
2005	19,129	12,649	50,102	19,054	12,432	62,454
2006	9,470	7,117	53,355	9,263	6,973	66,508
LATER	47,327	20,960	2,039,366	34,040	16,016	2,542,159
TOTAL	519,926	231,138	2,281,911	479,197	222,901	2,856,218

B. WITH MANGOL DAM BASIS (including O and M costs)

YEAR	1. Financial Basis Cost/Benefit Flow Pattern			2. Economic Basis Cost/Benefit Flow Pattern		
	TOTAL COST	L.C.COST	BENEFIT	TOTAL COST	L.C.COST	BENEFIT
1994	10,469	0	0	5,009	0	0
1995	10,508	0	0	8,856	0	0
1996	23,202	0	0	20,732	0	0
1997	39,038	9,229	0	35,784	9,091	0
1998	110,717	10,870	3,074	101,656	10,704	3,645
1999	125,450	26,614	6,666	117,157	26,254	7,846
2000	146,112	28,663	16,317	135,763	28,259	20,086
2001	145,229	31,360	27,036	135,225	30,928	33,776
2002	141,287	31,437	38,965	131,866	30,908	49,070
2003	137,141	28,505	50,888	128,065	28,041	64,365
2004	97,925	23,734	61,794	90,521	23,295	78,391
2005	78,657	12,649	71,144	73,408	12,432	90,750
2006	9,642	7,117	76,557	9,563	6,973	98,032
LATER	55,632	20,960	2,941,685	56,503	16,016	3,772,520
TOTAL	1,131,009	231,138	3,294,126	1,050,108	222,901	4,218,481

note : L.C. ; Land Consolidation, as a part of TOTAL COST
For With-Dam benefit, mid-summer drainage and expanded
berseem acreage up to 66.3% of total rice field were
included.

Table E.3.3-3 (1) Breakdown of Benefits into Subdistricts financial unit : ha

Sub-District	Total Area	Single Cropping	Double Cropping	Area under Acreage		That of		
				Berseem	Vegetables	Broadbean	Barley	
HW(I)	WOP	11,239	7,376	3,863	1,663	1,990	90	120
	W P	10,680	3,793	6,887	4,287	2,510	90	0
HE(I)	WOP	11,594	8,964	2,630	1,575	745	100	210
	W P	11,019	4,127	6,892	5,599	1,053	240	0
HE(II)	WOP	8,987	6,542	2,445	1,702	743	0	0
	W P	8,539	3,748	4,791	3,960	831	0	0
HE(III)	WOP	4,681	3,999	682	510	172	0	0
	W P	4,447	1,781	2,666	2,450	216	0	0
AW(I)	WOP	5,774	5,774	0	0	0	0	0
	W P	5,486	2,341	3,145	3,072	73	0	0
AW(II)	WOP	12,604	12,604	0	0	0	0	0
	W P	11,977	4,975	7,002	6,355	647	0	0
AE(I)	WOP	6,234	6,234	0	0	0	0	0
	W P	5,924	2,489	3,435	3,173	262	0	0
AE(II)	WOP	7,768	7,768	0	0	0	0	0
	W P	7,379	3,214	4,165	4,165	0	0	0
AE(III)	WOP	11,088	11,088	0	0	0	0	0
	W P	10,534	4,904	5,630	4,932	698	0	0
TOTAL	WOP	79,969	70,349	9,620	5,450	3,650	190	330
	W P	75,985	31,372	44,613	37,993	6,290	330	0

Sub-District	Total Paddy	unit : ha			unit kg/ha			
		Tarom	Khazar	Amol-3	Yield of Tarom	Yield of Khazar	Yield of Amol-3	
HW(I)	WOP	11,239	5,318	3,548	2,373	4,135	5,741	7,375
	W P	10,680	3,877	3,876	2,927	4,437	6,378	7,972
HE(I)	WOP	11,594	5,486	3,660	2,448	4,135	5,741	7,375
	W P	11,019	4,339	4,339	2,341	4,437	6,378	7,972
HE(II)	WOP	8,987	4,252	2,837	1,898	4,135	5,741	7,375
	W P	8,539	2,798	2,797	2,944	4,437	6,378	7,972
HE(III)	WOP	4,681	2,215	1,477	989	4,135	5,741	7,375
	W P	4,447	1,636	1,636	1,175	4,437	6,378	7,972
AW(I)	WOP	5,775	2,380	2,757	638	4,135	5,741	7,375
	W P	5,486	2,100	2,100	1,286	4,437	6,378	7,972
AW(II)	WOP	12,603	5,194	6,017	1,392	4,135	5,741	7,375
	W P	11,977	4,188	4,189	3,600	4,437	6,378	7,972
AE(I)	WOP	6,233	2,569	2,976	688	4,135	5,741	7,375
	W P	5,924	2,163	2,164	1,597	4,437	6,378	7,972
AE(II)	WOP	7,768	3,201	3,709	858	4,135	5,741	7,375
	W P	7,379	2,858	2,858	1,663	4,437	6,378	7,972
AE(III)	WOP	11,089	4,570	5,294	1,225	4,135	5,741	7,375
	W P	10,534	4,535	4,535	1,464	4,437	6,378	7,972
TOTAL	WOP	79,969	35,185	32,275	12,509	4,135	5,741	7,375
	W P	75,985	28,494	28,494	18,997	4,437	6,378	7,972

PRODUCTION		TAROM	KHAZAR	AMOL-3	BERSEEM	VEGETABLES	BROADBEAN	BARLEY
HW(I)	WOP	21,990	20,369	17,501	87,308	44,775	225	360
	W P	17,202	24,721	23,334	257,220	56,475	225	0
HE(I)	WOP	22,685	21,012	18,054	82,688	16,763	250	630
	W P	19,252	27,674	18,662	335,940	23,693	600	0
HE(II)	WOP	17,582	16,287	13,998	89,355	16,718	0	0
	W P	12,415	17,839	23,470	237,600	18,698	0	0
HE(III)	WOP	9,159	8,479	7,294	26,775	3,870	0	0
	W P	7,259	10,434	9,367	147,000	4,860	0	0
AW(I)	WOP	9,841	15,828	4,705	0	0	0	0
	W P	9,318	13,394	10,252	184,320	1,643	0	0
AW(II)	WOP	21,477	34,544	10,266	0	0	0	0
	W P	18,582	26,717	28,699	381,300	14,558	0	0
AE(I)	WOP	10,623	17,085	5,074	0	0	0	0
	W P	9,597	13,802	12,731	190,380	5,895	0	0
AE(II)	WOP	13,236	21,293	6,328	0	0	0	0
	W P	12,681	18,228	13,257	249,900	0	0	0
AE(III)	WOP	18,897	30,393	9,034	0	0	0	0
	W P	20,122	28,924	11,671	295,920	15,705	0	0
TOTAL	WOP	145,490	185,291	92,254	286,125	82,125	475	990
	W P	126,428	181,735	151,444	2,279,580	141,525	825	0

unit : million Rial

GROSSVALUE		TAROM	KHAZAR	AMOL-3	BERSEEM	VEGETABLES	BROADBEAN	BARLEY
HW(I)	WOP	14,535	10,572	6,353	1,921	4,701	25	27
	W P	11,371	12,830	8,470	5,659	5,930	25	0
HE(I)	WOP	14,995	10,905	6,554	1,819	1,760	28	47
	W P	12,726	14,363	6,774	7,391	2,488	66	0
HE(II)	WOP	11,622	8,453	5,081	1,966	1,755	0	0
	W P	8,206	9,259	8,519	5,227	1,963	0	0
HE(III)	WOP	6,054	4,401	2,648	589	406	0	0
	W P	4,798	5,415	3,400	3,234	510	0	0
AW(I)	WOP	6,505	8,215	1,708	0	0	0	0
	W P	6,159	6,951	3,721	4,055	172	0	0
AW(II)	WOP	14,196	17,928	3,727	0	0	0	0
	W P	12,283	13,866	10,418	8,389	1,529	0	0
AE(I)	WOP	7,022	8,867	1,842	0	0	0	0
	W P	6,344	7,163	4,621	4,188	619	0	0
AE(II)	WOP	8,749	11,051	2,297	0	0	0	0
	W P	8,382	9,461	4,812	5,498	0	0	0
AE(III)	WOP	12,491	15,774	3,279	0	0	0	0
	W P	13,301	15,012	4,237	6,510	1,649	0	0
TOTAL	WOP	96,169	96,166	33,488	6,295	8,623	52	73
	W P	83,569	94,320	54,974	50,151	14,860	91	0

NET VALUE		TAROM	KHAZAR	AMOL-3	BERSEEM	VEGETABLES	BROADBEAN	Total N B and BARLEY
unit : million Rial								
HW(I)	WOP	9,958	6,894	3,893	1,433	2,132	9	24,321
	W P	7,878	8,930	5,604	4,302	3,509	8	30,231
HE(I)	WOP	10,273	7,112	4,016	1,357	798	12	23,569
	W P	8,816	9,997	4,482	5,619	1,472	22	30,409
HE(II)	WOP	7,962	5,513	3,114	1,467	796	0	18,852
	W P	5,685	6,444	5,637	3,974	1,162	0	22,902
HE(III)	WOP	4,148	2,870	1,623	440	184	0	9,264
	W P	3,324	3,769	2,250	2,459	302	0	12,104
AW(I)	WOP	4,457	5,357	1,047	0	0	0	10,861
	W P	4,267	4,838	2,462	3,083	102	0	14,752
AW(II)	WOP	9,726	11,692	2,284	0	0	0	23,702
	W P	8,510	9,651	6,893	6,377	905	0	32,335
AE(I)	WOP	4,811	5,783	1,129	0	0	0	11,722
	W P	4,395	4,986	3,058	3,184	366	0	15,989
AE(II)	WOP	5,994	7,207	1,408	0	0	0	14,609
	W P	5,807	6,585	3,184	4,180	0	0	19,755
AE(III)	WOP	8,558	10,287	2,010	0	0	0	20,855
	W P	9,215	10,448	2,803	4,949	976	0	28,391
TOTAL	WOP	65,887	62,715	20,523	4,697	3,911	21	157,754
	W P	57,896	65,647	36,373	38,127	8,794	31	206,868

Table E.3.3-3 (2) Breakdown of Economic Benefit into Subdistricts unless otherwise specified, unit in million Rial

GROSS VALUE		TAROM	KHAZAR	AMOL-3	BERSEEM	VEGETABLES	BROADBEAN	BARLEY
HW(I)	WOP	5,959	5,398	4,515	3,580	4,701	56	20
	W P	4,662	6,551	6,020	10,546	5,930	56	0
HE(I)	WOP	6,148	5,568	4,658	3,390	1,760	63	35
	W P	5,217	7,334	4,815	13,774	2,488	151	0
HE(II)	WOP	4,765	4,316	3,611	3,664	1,755	0	0
	W P	3,364	4,727	6,055	9,742	1,963	0	0
HE(III)	WOP	2,482	2,247	1,882	1,098	406	0	0
	W P	1,967	2,765	2,417	6,027	510	0	0
AW(I)	WOP	2,667	4,194	1,214	0	0	0	0
	W P	2,525	3,549	2,645	7,557	172	0	0
AW(II)	WOP	5,820	9,154	2,649	0	0	0	0
	W P	5,036	7,080	7,404	15,633	1,529	0	0
AE(I)	WOP	2,879	4,528	1,309	0	0	0	0
	W P	2,601	3,658	3,285	7,806	619	0	0
AE(II)	WOP	3,587	5,643	1,633	0	0	0	0
	W P	3,437	4,831	3,420	10,246	0	0	0
AE(III)	WOP	5,121	8,054	2,331	0	0	0	0
	W P	5,453	7,665	3,011	12,133	1,649	0	0
TOTAL	WOP	39,428	49,102	23,801	11,731	8,623	119	54
	W P	34,262	48,160	39,073	93,463	14,860	207	0

NET VALUE		TotalGROSS	Total	Total Crop	Net Margin	Net	Total Acr-	Net per
BENEFITS		Costs/ha	Prod.	COSTS	Ratio %	BENEFITS	eage/year	ha BENEFIT
HW(I)	WOP	24,230	0.508	7,677	68.3%	16,552	15,102	1.096
	WP	33,765	0.636	11,170	66.9%	22,599	17,567	1.286
HE(I)	WOP	21,621	0.479	6,807	68.5%	14,814	14,224	1.042
	WP	33,778	0.602	10,788	68.1%	22,993	17,911	1.284
HE(II)	WOP	18,111	0.478	5,468	69.8%	12,644	11,432	1.106
	WP	25,852	0.621	8,272	68.0%	17,583	13,330	1.319
HE(III)	WOP	8,115	0.486	2,608	67.9%	5,507	5,363	1.027
	WP	13,686	0.598	4,254	68.9%	9,435	7,113	1.326
AW(I)	WOP	8,075	0.515	2,974	63.2%	5,101	5,775	0.883
	WP	16,449	0.594	5,123	68.9%	11,329	8,631	1.313
AW(II)	WOP	17,623	0.515	6,491	63.2%	11,132	12,603	0.883
	WP	36,682	0.603	11,450	68.8%	25,234	18,979	1.330
AE(I)	WOP	8,715	0.515	3,210	63.2%	5,505	6,233	0.883
	WP	17,968	0.601	5,625	68.7%	12,345	9,359	1.319
AE(II)	WOP	10,862	0.515	4,001	63.2%	6,862	7,768	0.883
	WP	21,933	0.592	6,829	68.9%	15,107	11,544	1.309
AE(III)	WOP	15,506	0.515	5,711	63.2%	9,795	11,089	0.883
	WP	29,911	0.614	9,920	66.8%	19,994	16,164	1.237
TOTAL	WOP	132,859		44,947		87,912	89,589	0.981
	WP	230,024		73,431		156,619	120,598	1.299
Difference (WOP - WP)						68,707		

	TotalGross	Total Cost	Total Crop	Net Margin	Net	Rev. Net	Net/ha
	BENEFITS	per ha	Produc. Cost	Ratio %	Benefit	Benefit	Benefit
HW(I)	9,536	0.127	3,493	-0.014	6,046	6,048	0.566
HE(I)	12,156	0.124	3,981	-0.005	8,178	8,180	0.742
HE(II)	7,741	0.142	2,805	-0.018	4,939	4,940	0.579
HE(III)	5,571	0.112	1,646	0.011	3,928	3,929	0.883
AW(I)	8,374	0.078	2,148	0.057	6,228	6,230	1.136
AW(II)	19,059	0.088	4,959	0.056	14,102	14,106	1.178
AE(I)	9,252	0.086	2,415	0.055	6,840	6,842	1.155
AE(II)	11,071	0.077	2,828	0.057	8,246	8,248	1.118
AE(III)	14,405	0.099	4,208	0.037	10,199	10,202	0.968
TOTAL	97,165		28,484		68,707	68,725	

Table E.3.3-4 Paddy Yield Estimation from Recent Trends through linear regression

(1) Without-Project Yields

YEAR	TAROM	KHAZAR	AMOL-3	TAROM & AMOL-3	KHAZAR	
1985	4,800	-	8,100	-3.5	-	
1986	4,100	-	7,900	-2.5	-	
1987	4,450	2,200	7,050	-1.5	-2.5	
1988	3,440	4,230	5,510	-0.5	-1.5	
1989	4,968	5,391	7,898	0.5	-0.5	
1990	4,106	5,542	8,144	1.5	0.5	
1991	5,030	5,700	6,590	2.5	1.5	
1992	3,500	4,500	8,100	TOTAL OF	3.5	2.5
AVERAGE	4,299	4,594	7,412	SQUARE---	42	18
SIGMA XY	-35,445	33,468	-1,977	TAROM Y=	-47	(X-1988.5)+4299
	-14,541	22,571	8,031	KHAZAR Y=	459	(X-1989.5)+4594
	-61,430	60,990	-440	AMOL-3 Y=	-10	(X-1988.5)+7412

ESTIMATED YIELD IN 1992	
TAROM	4,135
KHAZAR	5,741
AMOL-3	7,375

(2) With-Project Yields (unit : % of the present yield, and kg. for Yield)

Crop and Maturity	Optimum Density %	Optimum Seedling %	Preventing Input loss %	Without-Dam Increment Rate %	Basis W.P. Yield	Mid-summer Drying etc %	With-Dam Basis W.P. Yield
earlyTAROM	2.3	2.4	2.6	7.3	4,436	5.6	4,668
med.KHAZAR	4.5	2.8	3.8	11.1	6,378	5.6	6,700
lateAMOL-3	4.5	0.8	2.8	8.1	7,972	5.6	8,385
BIERSEEM	14.3 (Improved Drainage)			52.5*1.163	60,000	52.5*1.163	60,000

Note : rates of yield increment are based on the data by SARI station, as given in Appendix C. Table C.2-5, Table C.2-6 and Table C.2-7.

Table E.3.3-5 Financial Household Farm Budget Balance

		unit : ha / farm					
Item	With/Without acreaage ha	type A1	type A2	type B1	type B2	type C1	type C2
Holding		1.00	1.00	2.50	2.50	5.00	5.00
Cropping Intensity %							
	W.O.P.	143%	130%	124%	117%	110%	107%
	W. P.	175%	167%	158%	150%	150%	133%
PaddyTaron	W.O.P.	0.00	1.00	1.50	1.00	2.00	2.00
	W. P.	0.00	0.50	1.00	0.50	1.50	1.50
Khazar	W.O.P.	1.00	0.00	1.00	1.00	2.00	1.50
	W. P.	1.00	0.00	1.00	1.00	2.00	1.50
Amol-3	W.O.P.	0.00	0.00	0.00	0.50	1.00	1.50
	W. P.	0.00	0.50	0.50	1.00	1.50	2.00
Berseem	W.O.P.	0.33	0.20	0.50	0.33	0.50	0.33
	W. P.	0.58	0.50	1.25	1.00	2.50	1.67
Vegetables	W.O.P.	0.10	0.10	0.10	0.10	0.00	0.00
	W. P.	0.17	0.17	0.20	0.25	0.00	0.00
Gross Income/year		(1000 Rial)					
PaddyTaron	W.O.P.	0	2733	4100	2733	5466	5466
	W. P.	0	1543	3086	1543	4628	4628
Khazar	W.O.P.	2980	0	2980	2980	5959	4469
	W. P.	3477	0	3477	3477	6955	5216
Amol-3	W.O.P.	0	0	0	1339	2677	4016
	W. P.	0	1522	1522	3044	4566	6088
Berseem	W.O.P.	381	231	578	381	578	381
	W. P.	592	660	1650	1320	3300	2204
Vegetables	W.O.P.	236	236	236	236	0	0
	W. P.	402	402	473	591	0	0
Net Income/year		(1000 Rial)					
PaddyTaron	W.O.P.	0	1774	2862	1908	4264	4264
	W. P.	0	1055	2246	1123	3712	3712
Khazar	W.O.P.	1776	0	1943	1943	4452	3339
	W. P.	2427	0	2573	2573	5633	4225
Amol-3	W.O.P.	0	0	0	821	1922	2883
	W. P.	0	995	1068	2137	3575	4767
Berseem	W.O.P.	284	172	431	284	431	284
	W. P.	450	502	1254	1003	2508	1675
Vegetables	W.O.P.	107	107	107	107	0	0
	W. P.	238	238	280	350	0	0
Total Farm	W.O.P.	2167	2053	5342	5063	11068	10770
Income	W. P.	3115	2790	7422	7186	15428	14379
Off-farm	W.O.P.	815	832	476	672	0	238
Income	W. P.	978	998	571	806	0	0
Household	W.O.P.	2982	2885	5818	5735	11068	11008
Income	W. P.	4093	3788	7993	7992	15428	14379
Difference	WP/WOP %	137.2%	131.3%	137.4%	139.4%	139.4%	130.6%
	WP - WOP	1110	902	2174	2257	4360	3371
Living Expense/year		2710	2710	4134	4134	8406	8406
Annual	W.O.P.	77	-408	46	532	2034	2034
Surplus	W. P.	1383	1078	3859	3858	7022	5973
Land Consolidation		361	361	903	903	1805	1805
Installment/Surplus%		26%	33%	23%	23%	26%	30%

Table E.3.4-1 Breakdown of Production-Cost/Benefit by Project Component

A) WITHOUT-DAM BASIS unit : % of Project Financial Benefit

CROP	FACTOR	IRRIGATION	DRAINAGE(of which)	O.F.L.C.(of which)	TOTAL
			(labor saving)	(labor saving)	
RICE	BENEFIT	16.3%	22.1%	3.9%	42.3%
	COST	3.0%	3.0% (2.4%)	-0.5% (10.5%)	5.5% (12.9%)
BERSEEM	BENEFIT	-	8.5%	51.0%	59.5%
	COST	-	-1.0% (1.0%)	-13.0% (2.1%)	-14.0% (3.1%)
VEGETABLE	BENEFIT	-	4.2%	4.1%	8.3%
	COST	-	-2.3% (0.3%)	0.5% (0.4%)	-1.8% (0.7%)
OTHERS	BENEFIT	-	0.1%	-	0.1%
	COST	-	-	-	0.0%
TOTAL	BENEFIT	16.3%	34.9%	59.0%	110.2%
	COST	3.0%	-0.2%	-13.0%	-10.2%
	TOTAL	19.3%	34.7% (3.7%)	46.0% (13.0%)	100.0% (16.7%)

B) WITH-MANGOL DAM BASIS

CROP.FCTR	IRRIGATION(of which)	DRAINAGE(of which)	O.F.L.C.(of which)	TOTAL	
	(labor saving)	(labor saving)	(labor saving)		
RICE	BFT.	16.1%	18.8%	3.3%	38.2%
	COST	15.3% (5.2%)	2.6% (1.4%)	-0.4% (6.3%)	17.4% (12.9%)
BER- SEEM	BFT.	-	7.2%	43.4%	50.6%
	COST	-	-0.9% (0.7%)	-11.1% (1.4%)	-11.9% (3.1%)
VEGE- TABLE	BFT.	-	3.6%	3.5%	7.1%
	COST	-	-2.0% (0.3%)	0.4% (0.4%)	-1.5% (0.7%)
OTHERS	BFT	-	0.1%	0.0%	0.1%
	COST	-	0.0%	0.0%	0.0%
TOTAL		16.1%	29.7%	50.2%	95.9%
		15.3% (5.2%)	-0.2% (2.3%)	-11.1% (8.0%)	4.1%
		31.4%	29.5%	39.1%	100.0%

Note : strictly speaking, benefits and costs for each crop can hardly be disintegrated into components. The above shown estimation is based on so many assumptive conditions. Major ones are : financial basis only, with Mangol dam otherwise effect of irrigation becomes negligible, positive cost derived from either labor saving or scale merit by employing larger size machinery, effect of irrigation attributable to mid-summer drainage effect of rice because once water is drained from paddy lots, recharging from water source is necessary. The effect of labor saving account for ca. 17%, but it is masked by heavy expense of machinery and other input costs, leading to overall negative figures of costs, which are actually summed up to -27%.
 O. F. L. C. : on farm land consolidation Where to allocate changes

BENEFIT		WITHOUT-DAM BASIS,	
WITHOUT PROJECT LEVEL PRODUCTION	$Y \times dS$	CURRENT YIELD	$YdS/2$ each for Drainage and Land Consolidation.
$-S \times dY$	$-dS \times dY$	Y.DROP	YdS from mid-summer drainage only for the Irrigation effect, yield loss prevention to Irrig.
$S \times dY$	$dS \times dY$	YIELD GAIN	SdY only to Land Consolidation $dSdY/2$ to Drainage and Land C.
CURRENT CROP AREA	EXPANDED OR SHRUNKED		$-SdY$ and $-dSdY$ indicate loss from ullage or area decrease attributed to Land Consolidation

C O S T		WITH-DAM BASIS,	
WITHOUT PROJECT LEVEL PRODUCTION	$C \times dS$	CURRENT C O S T	in addition to the above allocation, mid-summer drainage and yield loss prevention, estimated from the minimum
$-S \times dC$	$-dC \times dS$	C O S T SAVING	yield and negative regression
$S \times dC$	$dC \times dS$	INCREASED C O S T	in the long trends of paddy yields for early and late rice varieties. No effect from estimated from the minimum necessary for winter crops.
CURRENT CROP AREA	EXPANDED OR SHRUNKED		

cost saving includes saving by scale merit from larger-sized machinery and by ullage of paddy acreage from Land Consolidation, allocatable to it. $SdC/3$ allocated to Drainage, Land Consolidation and Irrigation, while $dCdS$ is allocated only to Land Consolidation.

The result of calculation is summarized in the above Tables, where the percentage based on the common denominator, or financial project benefit WITH- or WITHOUT DAM. Of course, the benefits from these two cases are different, and WITH-DAM basis includes mid-summer drainage and potential drought-loss preventive effects in the level of yields of paddy.

Table E.3.4.2 (1) Mechanization Benefit Calculated From Cost-Benefit Comparison Between Without and With-Project (Financial Basis Only)

Item	Without-Project	With Project			Difference
		<u>1. Transplanting</u>			
System	Field nursery - Manual Planting	Box Nursery - Transplanter			mechanized
BENEFITS		<u>Taron</u>	<u>Khazar</u>	<u>Amol-3</u>	
control seedling number	0	88.3	134.1	120.5	+322.9
control optimum density	0	85.8	71.5	21.4	+158.5
timely transplanting	0	35.5	58.8	37.8	+129.6
COSTS					
nursery labor 7.5 x 5.3 =	39.7	6.7 x 5.3 = 35.5			+ 4.2
plant' labor 13.8 x 7.6 =	103.3	0			+103.3
operator cost(1000Rial)	0	1.7 x 4.1 = 7.0			- 7.0
depreciation of box-nursery	0	3.175/7.5ha (6.0years)			- 97.1
depreciation of transplanter	0	11,231/50ha (5.0years)			- 57.0
fuel for box nursery	0	0.9/ha			- 0.9
fuel for transplanter	0	0.2/ha			- 0.2
maintenance for box nursery	0	10.2/ha			- 10.2
maintenance for transplanter	0	6.2/ha			- 6.2
Total Benefit per ha BY USE OF TRANSPLANTER					+538.9
		<u>2. Harvesting</u>			
System	Manual Reaping - Small-thresher	Auto-Threshing- Combine-Harvester			mechanized
BENEFITS					
earlier berseem sowing	0	52.5t/ha x 7% x 22Rial/t =			+ 80.9
lessening grain loss	0	5,547kg/ha x 1% x 533Rial/t =			+ 29.6
COSTS					
cutting labor 13.4 x 8.8 =	118.5	2.5times x 8.8ths = 21.5			+ 94.0
collecting labor 5 x 8.8 =	43.9	1.0 x 8.8thsR = 8.8			+ 35.1
threshing labor 5 x 8.2 =	40.9	1.5 x 8.2thsR = 12.3			+ 28.8
operator cost(1000R/hr)	0	1.7 x 3.4thsR = 5.8			- 5.8
depreciation 350/2ha=175/ha of thresher 175(5years)	44.5	44,039/50ha = 880.8/ha 880.8(6.1years) = 201.0			-158.3
machinery fuel	0.25/ha	0.40/ha			- 0.2
maintenance	1.5/ha	5.1/ha			- 4.1
Total Benefit per ha BY USE OF AUTO-COMBINE					+101.8

(CONTINUED)

Table E.3.4.2 (1) Mechanization Benefit Calculated From
 Cost-Benefit Comparison Between Without
 and With-Project (Financial Basis Only) (CONT'D)

Item	Without-Project	With-Project	
<u>3. Cultivating</u>			
System	power tiller and manual tillage	big-size tractor with attachment	more mechanized
BENEFITS			
earlier berseem sowing	0	52.5t/ha x 0.022 = 28.9	+ 28.9
COSTS for rice			
plowing labor	4.5 x 4.1 = 18.5	0	+ 18.5
bunding labor	3.2 x 6.7 = 21.4	0	+ 21.4
manuring lab.	1.0 x 5.8 = 5.8	0	+ 5.8
weeding lab.	11.1 x 6.4 = 71.2	5.6 x 6.4 = 35.8	+ 35.4
spraying lab.	1.3 x 5.8 = 7.5	1.3 x 5.8 = 7.5	0
irrigation	7.4 x 4.6 = 34.4	7.4 x 4.6 = 34.4	0
canal align.	2.4 x 4.8 = 11.6	0	+ 11.6
COSTS for berseem			
sowing labor	0.8 x 4.5 = 3.6	0	+ 3.6
mowing labor	6.3 x 4.1 = 25.8	0	+ 25.8
COSTS for both crops			
operator cost	0	1.7 x (8.4+1.3) = 16.5	- 16.5
depreciation	3,200/5ha	49,480/50ha = 990/ha	
of powertiller(5years)	154.2	(5.8years)	- 84.3
machinery fuel	0.5/ha 0.5	3.3/ha	- 2.8
maintenance	0.8/ha 0.8	5.1/ha	- 4.3
TOTAL BENEFIT per ha By Large-Sized Tractor			+ 37.3

Summary of Estimated Financial Benefits from Rice-Berseem Production System

Number of Machinery Sets Covering 50ha/set ; $37,993/50 = 760$ sets
 per year Benefit from Transplanters ; $0.539/ha \times 37,993 = 20,478$ m. Rial
 per year Benefit from A.T. Combines ; $0.1018/ha \times 37,993 = 3,868$ m. Rial
 per year Benefit from Big Tractors ; $0.0373/ha \times 37,993 = 1,417$ m. Rial
 Total 760 sets for 37,993 ha will bring the total Benefits 25,763 m. Rial
 equivalent to 46.7 % of the total financial benefit of the project.
 This share, 46.7 % will be derived from a half of the total area,
 where berseem is expected to cover, though this value includes both
 crop and productivity components.

note : Direct comparison of machinery benefits by major field practice would not be meaningful because a timely use of machinery gives not only yield impact or labor saving, but making other field practices easier or even aftermath effect on the following grown crops could be expected. However, the above comparison provides a rough basis why such a machinery system should be replaced for present small size system.

Table E.3.4-2 (2) Mechanization Benefits on Crop Productivity

1. CALCULATION OF ACREAGE COVERED BY A SET OF MACHINERY

MACHINERY	SIZE/WIDTH	PEAK PERIOD OF WORK	ANNUAL O.P. DAYS	FIELD WORK EFFICIENCY	SPEED OF OPERATION	MAX. COVER-AGE (ha)	NUMBER OF SET/ha
TRANSPLANTER	8rows	Apr 21 - June 9	45	0.58	0.55	99.2	0.02
PADDY COMBINE	5rows	Aug 11 - Sept 25	41	0.65	0.74	96.6	0.02
PADDY TRACTOR	65 HP	Apr 6 - June 6	52	0.70	0.65	163.5	0.01
NURSERY SET	1200box	Mar 30 - May 19	21 x 1.5times/year, 32 days	11.5 mandays/1200boxes			0.15

note : plot size averages at 0.4ha, operating hours per day 8 hours, field efficiency adjusted by field size, workable days during period of field operation is set at 0.85 -0.9, puddling forms peak period of operation for tractor sets. Sets of machinery to be equipped per 100 ha is determined as double the maximum coverage for user's convenience

2. ESTIMATED DEPRECIATION OF MACHINERY ABOVE LISTED (in 1000 Rial, ton/set)

MACHINERY	ATTACHMENT	VALUE OF A	VALUE OF B	WEIGHT A + B	FREIGHT A + B	INLAND TRANS-PORT COST A+B	FINAL VALUE
T. PLANTER	parts	9,550	1,433	0.65	179	70	11,232
COMBINE	d.o.	35,140	5,587	3.16	869	338	41,934
TRACTOR	attachment	19,100	22,406	4.15	1,141	444	43,091
NURSERY	local box	2,261	226	1.80	405	193	3,085

3. ESTIMATED FINANCIAL DEPRECIATION COST PER HA (1000 Rial, ha)

MACHINERY	VALUE/SET	ha/MACHINE	VALUE/ha	HOURS/YEAR	LIFE(hrs)	DEPRECIATION/ha (hr)
T. PLANTER	11,232	0.02	224.6	360	2,700	38.1 (7.93)
COMBINE	41,934	0.02	838.7	328	3,000	138.0 (33.2)
TRACTOR	43,091	0.01	430.9	416	3,600	69.1 (28.6)
NURSERY	3,085	0.15	462.8	768	7,560	70.7 (1.05)
TOTAL MACHINERY						315.9 (70.8)

4. ESTIMATED ECONOMIC COST FOR MACHINERY OF PADDY CROPPING (1000 Rial/machinery)

MACHINERY	FOREIGN.C. PORTION	DOMESTIC C. PORTION	CONVERTED ECON. VALUE	ANNUAL FUEL COST	ECONOMIC FUEL COST	MAINTENENCE COST/YEAR	TOTAL ECON. COST
T. PLANTER	11,232	0	11,232	6.85	48	842	12,122
COMBINE	41,934	0	41,934	20.40	143	3,145	45,222
TRACTOR	32,318	10,773	40,366	164.40	1,151	3,027	44,544
NURSERY	1,851	1,234	2,773	6.75	47	208	3,028
TOTAL				198.40	1,389	7,223	104,916

Table E.3.4-2 Mechanization Benefits (Contd.)

5. WITH-PROJECT MACHINERY COST PER ha PER year (1000 Rial)

MACHINERY	ECONOMIC COST/SET	AREA COVERAGE/SET	ECON. COST PER ha	DEPRECIATION/y/ha	ECON. FUEL COST/y/ha	ECON. O.M. COST/y/ha	MACHINERY COST/y/ha
T. PLANTER	12,122	50	242.4	38.1	6.85	2.9	47.8
COMBINE	45,222	50	904.4	138.0	20.40	10.4	168.8
TRACTOR	44,544	100	445.4	69.1	164.40	5.2	238.7
NURSERY	3,028	7.5	403.7	70.7	6.75	5.3	82.8
TOTAL MACHINERY			1,996.1	315.9	198.40	23.7	538.0

(contd.)

6. ESTIMATED WITH-PROJECT LABOR COST PER ha PER year (1000 Rial) Rial)

MANUAL LABOR COMPONENT/ha	MACHINERY OPERATION	NURSERY CARING	WEEDING/ REPLANTING	IRRIGATION	POST-HARVEST LABOR	TOTAL LABOR/ha
man-day/ha	1.2	6.7	5.6	4.9	2.5	20.9
LABOR WAGE/manday	14.4	5.5	6.5	4.6	9.0	40.0
FINANCIAL COST / ha	17.3	36.9	36.4	22.5	22.5	135.6
conversion factor	0.906	0.376	0.376	0.376	0.376	0.406
ECONOMIC COST / ha	15.7	13.9	13.7	8.5	8.5	60.1

7. ESTIMATED WITH-PROJECT OTHER INPUT COST PER ha PER year (1000 Rial)

KIND OF INPUT MAJOR INPUT NAME	PADDYSEED Amol -3	FERTIKIZER urea	CHEMICALS satarn	WATER per ha	FEE DRYINGKIT heat drier	subtotal
QUANTITY/ha/year/kg	30	350	15	12000cu.m	1	
UNIT INPUT COST/kg	0.805	0.019	1.600	0.003	10.168	
FINANCIAL COST / ha	24.15	6.65	24.00	30.00	10.17	94.968
conversion factor	0.906	0.981	1.000	0.482	0.774	
ECONOMIC COST / ha	21.880	6.524	24.000	14.460	7.870	74.734
						TOTAL
MAJOR INPUT NAME	benlate	D.A.P.	diazinon	drying labor	fuel	INPUT COST
QUANTITY/ha/year	0.5	100	12	0.5manday	12	
UNIT INPUT COST / kg	1.650	0.025	0.325	8.500	0.015	
FINANCIAL COST / ha	0.825	2.500	3.900	4.250	0.180	106.623
conversion factor	1.000	0.981	1.000	0.376	7.000	
ECONOMIC COST / ha	0.825	2.453	3.900	1.598	1.260	84.769

8. PROPOSED WITH-PROJECT PRODUCTION COST PER ha PER year (1000 Rial)

COST-PRICE BASIS	MACHINERY	MAN LABOR	OTHER INPUT	TOTAL COST	per cent
FINANCIAL PRICE	538.0	135.6	106.6	780.2	
ECONOMIC PRICE	538.0	60.1	84.8	682.9	87.5

Table E.3.4-2 (2) Mechanization Benefits (Contd.)

9. PLANNED MAJOR MACHINERY OPERATION COVERING 100 ha / 2 SETS OF MACHINERY

Crop Operation	unit : * hrs/ha + days/year						
	paddy	paddy	paddy	paddy	paddy	berseem	berseem
Operation	plowing	puddling	planting	spraying	harvesting	plowing	mowing
Machinery	tractor	d. o.	transplanter	tractor	ATcombine	tractor	tractor
Period in	Mar.10	Apr.10	Apr.20	Jun.15	Aug. 1	Sept.1	Jan.15
Period out	Apr.15	May 20	May 31	Jul.31	Sept20	Oct.20	Mar.31
Fine Days+	33.0	37.0	38.0	43.0	46.0	32.0	51.0
Speed(A) *	3.1	3.2	3.0	2.6	3.4	1.8	3.6
F.E. (B)	0.70	0.70	0.70	0.65	0.70	0.70	0.65
W.R. (AB)*	4.43	4.57	4.29	4.00	4.86	2.57	5.54
Days/year	27.7	28.6	26.8	25.0	30.4	16.1	34.6
% FineDays	83.9	77.2	70.5	58.1	66.0	50.2	67.9

note : Speed; operation speed of machinery. F.E.; field efficiency
W.R.; effectiveness working rate, Days/year; days required to cover 50 ha
by a set of machinery, % Fine days; rate of operation on fine days,
unit of puddling counted twice, also spraying counted twice = 1.3 x 2,
while grass cutting counted as 3 times = 1.2 x 3.

Annual Working Hours and Depreciation per ha by Machinery
Calculated from the above shown system of joint use

Machinery	Annual Operation Days Covering 50ha	Total hrs per year	Total hrs per ha	Machine Life,hrs	1000 Rial	
					Depreciation Cost/ha/year	Life years
TRACTOR	131.9	1055.2	21.1	3,600	293.4	3.4
T.PLANTER	26.8	214.4	4.3	2,700	60.5	12.6
AT COMBINE	28.3	226.4	4.5	3,000	214.8	13.3

note : T.PLANTER; transplaner, out of the cost for tractor, 73.8% account for
the share for paddy, and 26.2% that on berseem. AT ; Auto-Threshing

Financial Costs of Machinery Use by the System of 2 sets/100ha as Shown Above

Machinery	Annual Cost in 1000 Rial/50ha				Total Cost /ha/year*	Crop Income/ha/year Paddy + Berseem	Rate of MachinCost
	Fuel etc.	Operator	Spareparts				
TRACTOR	896.9	1118.5	1455.3	362.8			
T.PLANTER	27.9	227.3	133.7	68.3	3222.0	1320.0	
AT COMBINE	113.2	240.0	496.7	231.8		14.6%	

note : * including depreciation, 152.9 2130.0 256.0 6.4%
corresponding data from current farm economy is given the above column.

Table E.3.5-1 Internal Rate of Return and Benefit Cost Ratio

(1) Economic and Financial Internal Rate of Return

AREA	CROPPING INTENSITY	WITHOUT MANGOL DAM		WITH MANGOL DAM	
		EIRR	FIRR	EIRR	FIRR
TOTAL PROJECT	158.7%	13.5%	10.1%	9.3%	6.5%
HW-1	164.5%	7.3%	7.0%	6.9%	5.7%
HE-1	162.5%	9.8%	8.6%	9.3%	6.6%
HE-2	156.1%	9.4%	8.5%	9.2%	6.3%
HE-3	159.9%	12.9%	9.9%	10.8%	6.9%
AW-1	157.3%	15.6%	10.6%	9.0%	5.9%
AW-2	158.5%	20.0%	13.7%	14.9%	9.2%
AE-1	158.0%	17.4%	11.8%	10.8%	6.9%
AE-2	156.4%	17.8%	12.2%	9.9%	6.6%
AE-3	153.4%	13.2%	10.4%	4.5%	4.0%

(2) Benefit/Cost Ratios on Without-Mangol Dam Basis*

AREA	B/C by Economic Price			B/C by Financial Price			
	at 12%	at 9%	at 6%	at 12%	at 9%	at 6%	at 3%
TOTAL PROJECT	1.14	1.53	2.20	-	1.13	1.63	2.56
HW-1	-	-	1.18	-	-	1.23	1.94
HE-1	-	1.08	1.56	-	-	1.38	2.16
HE-2	-	1.05	1.50	-	-	1.36	2.13
HE-3	1.08	1.44	2.04	-	1.09	1.55	2.40
AW-1	1.34	1.80	2.58	-	1.18	1.70	2.64
AW-2	1.85	2.50	3.61	1.17	1.58	2.29	3.61
AE-1	1.51	2.01	2.87	-	1.31	1.87	2.90
AE-2	1.55	2.08	2.96	1.02	1.37	1.95	3.03
AE-3	1.11	1.49	2.12	-	1.15	1.65	2.56

Note : * B/Cs on With-Mangol Dam basis are too low to present here.
B/C values below 1.00 are not listed (with the mark -).

Table E.3.5-2 CALCULATION OF EIRR FOR HARAZ PROJECT AS TOTAL
WITHOUT MANGOL DAM

Year	Capital Cost	O & M Cost	Total With Dam	Benefit	Return	Case - 1		Case - 2		Case - 3	
						NPV		NPV		NPV	
						Int. =	0.11	Int. =	0.12	Int. =	0.13
					Cost	Benefit	Cost	Benefit	Cost	Benefit	
1	9292	0	9292	0	-9292	2050	0	2032	0	2014	0
2	7760	0	7760	0	-7760	6298	0	6196	0	6077	0
3	19517	0	19517	0	-19517	14271	0	13892	0	13526	0
4	33885	0	33885	0	-33885	22321	0	21535	0	20782	0
5	45205	44	45249	3023	-42226	26853	1794	25675	1715	24559	1641
6	61875	93	61968	6596	-55372	33131	3526	31395	3342	29764	3168
7	53542	196	53738	15391	-38347	25883	7413	24308	6962	22842	6542
8	52922	298	53220	24803	-28417	23094	10763	21495	10018	20019	9330
9	49588	394	49982	35110	-14872	19539	13725	18024	12661	26638	11688
10	45765	482	46247	45415	-832	16287	15994	14890	14622	13624	13379
11	35419	563	35982	54759	18777	11416	17374	10344	15742	9380	14276
12	18427	627	19054	62454	43400	5446	17852	4891	16030	4396	14409
13	8584	679	9263	66508	57245	2385	17127	2123	15242	1891	13579
14	0	679	679	68707	68028	158	15940	139	14059	123	12414
15	0	679	679	68707	68028	142	14360	124	12553	109	10986
16	0	679	679	68707	68028	128	12937	111	11208	96	9722
17	0	679	679	68707	68028	115	11655	99	10007	85	8603
18	0	1163	1163	68707	67544	178	10500	151	8935	129	7614
19	0	1163	1163	68707	67544	160	9459	135	7977	114	6738
20	0	1014	1014	68707	67693	126	8522	105	7123	88	5963
21	0	1464	1464	68707	67243	164	7677	136	6359	112	5277
22	0	1129	1129	68707	67578	114	6917	93	5878	77	4670
23	0	679	679	68707	68028	62	6231	50	5070	41	4132
24	0	679	679	68707	68028	55	5614	45	4527	36	3657
25	0	679	679	68707	68028	50	5057	40	4042	32	3236
26	0	679	679	68707	68028	45	4556	36	3609	28	2864
27	0	679	679	68707	68028	41	4105	32	3222	25	2534
28	0	1163	1163	68707	67544	63	3698	49	2877	38	2243
29	0	1163	1163	68707	67544	56	3331	43	2568	34	1985
30	0	1014	1014	68707	67693	44	3001	34	2293	26	1756
31	0	1464	1464	68707	67243	58	2704	44	2048	33	1554
32	0	1129	1129	68707	67578	40	2436	30	1828	23	1376
33	0	679	679	68707	68028	22	2195	16	1632	12	1217
34	0	679	679	68707	68028	20	1977	14	1457	11	1077
35	0	679	679	68707	68028	18	1781	13	1301	9	953
36	0	679	679	68707	68028	16	1605	11	1162	8	844
37	0	679	679	68707	68028	14	1446	10	1037	7	747
38	0	1163	1163	68707	67544	22	1302	16	926	11	661
39	0	1163	1163	68707	67544	20	1173	14	827	10	585
40	0	1014	1014	68707	67693	16	1057	11	738	8	517
41	0	1464	1464	68707	67243	20	952	14	659	10	458
42	0	1129	1129	68707	67578	14	858	10	589	7	405
43	0	679	679	68707	68028	8	773	5	526	4	359
44	0	679	679	68707	68028	7	696	5	469	3	317
45	0	679	679	68707	68028	6	627	4	419	3	281
46	0	679	679	68707	68028	6	565	4	374	2	249
47	0	679	679	68707	68028	5	509	3	334	2	220
48	0	1163	1163	68707	67544	8	459	5	298	3	195
49	0	1163	1163	68707	67544	7	413	5	266	3	172
50	0	1014	1014	68707	67693	5	372	4	238	2	152
B/C =		5.96	479197	2856218	Total	217326	263031	204712	225569	193087	194741
						EIRR =		13.5 %			

Table E.3.5-2 (contd.)

WITHOUT DAM BASIS FIRR OF THE PROJECT

Year	Capital Cost	D & M Cost	Total	Benefit	Return	Case - 1		Case - 2		Case - 3	
						NPV		NPV		NPV	
						Int.=	0.09	Int.=	0.10	Int.=	0.11
	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit			
1	10445	0	10445	0	-10445	2413.8	0.0	2391.8	0.0	2370.3	0.0
2	9165	0	9165	0	-9165	7714.0	0.0	7574.4	0.0	7438.5	0.0
3	21735	0	21735	0	-21735	16783.0	0.0	16329.8	0.0	15892.4	0.0
4	36782	0	36782	0	-36782	26057.1	0.0	25122.6	0.0	24229.4	0.0
5	49154	47	49201	2425	-46776	31977.3	1576.1	30550.0	1505.7	29198.4	1439.1
6	65371	102	65473	5291	-60182	39039.4	3154.9	36957.8	2986.6	35004.5	2828.8
7	56781	211	56992	12346	-44646	31176.6	6753.7	29245.9	6335.5	27450.7	5946.6
8	55827	321	56148	19898	-36250	28178.8	9986.1	26193.5	9282.6	24364.1	8634.3
9	51919	424	52343	18766	-33577	24100.2	8640.4	22198.5	7958.6	20462.2	7336.1
10	47758	518	48276	36433	-11843	20392.3	15389.7	18612.5	14046.5	17002.1	12831.1
11	36759	681	37440	43929	6489	14509.2	17023.9	13122.5	15396.8	11879.1	13937.9
12	19062	675	19737	50102	30365	7017.2	17813.0	6288.8	15964.0	5641.6	14321.2
13	8739	731	9470	53355	43885	3088.9	17403.3	2743.1	15455.0	2438.7	13739.7
14	0	731	731	55118	54387	218.7	16493.9	192.5	14514.3	169.6	12787.1
15	0	731	731	55118	54387	200.7	15132.0	175.0	13194.8	152.8	11519.9
16	0	731	731	55118	54387	184.1	13882.6	159.1	11995.3	137.6	10378.3
17	0	731	731	55118	54387	168.9	12736.3	144.6	10904.8	124.0	9349.8
18	0	1832	1832	55118	53286	388.4	11684.7	329.5	9913.5	280.0	8423.8
19	0	1832	1832	55118	53286	356.3	10719.9	299.5	9012.2	252.2	7588.5
20	0	1493	1493	55118	53625	266.4	9834.8	221.9	8192.9	185.2	6836.5
21	0	2516	2516	55118	52602	411.9	9022.7	340.0	7448.1	281.1	6159.0
22	0	1754	1754	55118	53364	263.4	8277.7	215.5	6771.0	176.6	5548.7
23	0	731	731	55118	54387	100.7	7594.2	81.6	6155.5	66.3	4998.8
24	0	731	731	55118	54387	92.4	6967.2	74.2	5595.9	59.7	4503.4
25	0	731	731	55118	54387	84.8	6391.9	67.5	5087.2	53.8	4057.1
26	0	731	731	55118	54387	77.8	5864.1	61.3	4624.7	48.5	3655.1
27	0	731	731	55118	54387	71.4	5379.9	55.8	4204.3	43.7	3292.9
28	0	1832	1832	55118	53286	164.1	4935.7	127.0	3822.1	98.6	2966.5
29	0	1832	1832	55118	53286	150.5	4528.2	115.5	3474.6	88.8	2672.6
30	0	1493	1493	55118	53625	112.5	4154.3	85.6	3158.7	65.2	2407.7
31	0	2516	2516	55118	52602	174.0	3811.3	131.1	2871.6	99.0	2169.1
32	0	1754	1754	55118	53364	111.3	3496.6	83.1	2610.5	62.2	1954.2
33	0	731	731	55118	54387	42.5	3207.9	31.5	2373.2	23.3	1760.5
34	0	731	731	55118	54387	39.0	2943.0	28.6	2157.5	21.0	1586.0
35	0	731	731	55118	54387	35.8	2700.0	26.0	1961.3	19.0	1428.9
36	0	731	731	55118	54387	32.9	2477.1	23.6	1783.0	17.1	1287.3
37	0	731	731	55118	54387	30.1	2272.5	21.5	1620.9	15.4	1159.7
38	0	1832	1832	55118	53286	69.3	2084.9	49.0	1473.6	34.7	1044.8
39	0	1832	1832	55118	53286	63.6	1912.8	44.5	1339.6	31.3	941.2
40	0	1493	1493	55118	53625	47.5	1754.8	33.0	1217.8	23.0	848.0
41	0	2516	2516	55118	52602	73.5	1609.9	50.5	1107.1	34.9	763.9
42	0	1754	1754	55118	53364	47.0	1477.0	32.0	1006.5	21.9	688.2
43	0	731	731	55118	54387	18.0	1355.0	12.1	915.0	8.2	620.0
44	0	731	731	55118	54387	16.5	1243.2	11.0	831.8	7.4	558.6
45	0	731	731	55118	54387	15.1	1140.5	10.0	756.2	6.7	503.2
46	0	731	731	55118	54387	13.9	1046.3	9.1	687.4	6.0	453.4
47	0	731	731	55118	54387	12.7	959.9	8.3	624.9	5.4	408.4
48	0	1832	1832	55118	53286	29.3	880.7	18.9	568.1	12.2	368.0
49	0	1832	1832	55118	53286	26.9	808.0	17.2	516.5	11.0	331.5
50	0	1493	1493	55118	53625	20.1	741.3	12.7	469.5	8.1	298.6
B/C =	4.38		520534	2281911	Total	263849.0	289263.9	247834.8	243893.4	233163.2	207333.3
FIRR =						10.1 %					

Table E.3.6-1 Results of Sensitivity Analysis by Economic Price

Impact Analysed	Without Dam Basis			With Dam Basis		
	Economic B/C	at rate	E.I.R.R.	Economic B/C	at rate	E.I.R.R.
(1) WITHOUT IMPACT	1.53	9%	13.5%	1.13	9%	9.3%
(2) DELAY IN LAND CONSOLIDATION WORKS BY 4 YEARS	1.42	6%	12.4%	1.37	6%	8.4%
(3) DELAY IN YIELD EFFECT BY 2YEARS	1.28	9%	11.1%	1.28	6%	7.9%
(4) COST BOOSTED BY 15% RELATED TO PRODUCT PRICES	1.36	9%	12.0%	1.28	6%	8.0%
(5) INTERACTION BETWEEN 1 AND 2	1.19	9%	10.4%	1.20	6%	7.2%
(6) INTERACTION BETWEEN 2 AND 3	1.11	9%	9.9%	1.13	6%	6.8%
(7) INTERACTION BETWEEN 3 AND 1	1.23	9%	11.0%	1.22	6%	7.5%
(8) INTERACTION AMONG 1,2 AND 3	1.58	6%	9.2%	1.07	6%	6.4%

Sensitivity Analysis To Relate Berseem Acreage With On-Farm Cost
unit : ha, %, million Rial

Coverage with berseem	% of the total	E.I.R.R.%	% of ha cost of	Total L.C.
ha	paddy field 75,985ha	with L.C.	L.C. balancing	cost to derive
	% by origi- nal LC cost	as proposed	with EIRR =12%	E.I.R.R. at 12%
50,384	66.3%	15.8%	15.8%	-
37,993	50.0%	13.5%	13.5%	-
36,093	47.5%	12.8%	12.8%	-
34,193	45.0%	12.0%	12.0%...100.0%	2.82 204,562
32,294	42.5%	11.3%	12.0%...85.0%	2.40 173,878
30,394	40.0%	9.5%	12.0%...68.0%	1.92 139,102
28,494	37.5%	8.7%	12.0%...52.0%	1.45 105,372
26,595	35.0%	8.0%	12.0%...35.0%	0.99 71,597
25,328	33.3%	7.4%	12.0%...24.0%	0.68 49,095

Note : provided that the land consolidation (L.C.) component of the project cost should be fully disbursed, berseem coverage of winter crop maintains EIRR value at 12% until it drops at 45% then EIRR falls up to 7.4% when the coverage dwindled to one third of paddy acreage. If EIRR is to be held at 12%, then land consolidation cost should be economized at the rates up to 245 of the original cost in case of coverage by 1/3. In this term, 1% loss of berseem acreage is equivalent to the 6.5% of cost economization for land consolidation. That is to say, land use with berseem acreage below 30% would not allow any land consolidation works, or inversely speaking crop intensity should be kept higher than 138% (including other winter crops designed) as far as L.C is employed in the Project.

Table E.3.6-2 Estimated Inflation Rate for Construction

ITEMS/year	unit : %					MEAN
	1986	1987	1988	1989	1990	
food	28.5	19.2	18.8	15.3	4.3	17.2
housing	19.8	23.1	27.5	17.2	7.6	19.0
fuel	10.9	17.0	8.0	-5.8	7.5	7.5
cloth	8.4	41.2	55.6	40.0	22.1	33.5
furniture	40.5	59.6	53.8	20.7	3.0	35.5
transport	16.6	43.5	37.2	10.9	22.1	26.1
health	6.9	2.8	5.0	17.3	14.6	9.3
education	85.9	46.3	39.7	-0.2	-7.5	32.8
others	20.4	33.6	12.7	14.2	17.6	19.7
labor wage	10.9	8.7	10.2	14.9	11.0	11.1
grain pr.	23.3	32.9	36.0	28.8	-4.6	23.3
ALL AREA RETAIL PR.	0.8	14.2	27.6	31.9	17.0	18.3
RURAL AREA RETAIL PR	3.6	17.4	27.1	22.3	16.9	17.5
RURAL FOOD RETAIL PR	6.4	19.8	26.8	15.0	21.0	17.8
WHOLESALE DOMESTIC P	22.5	27.0	22.0	18.4	20.0	22.0
WHOLESALE IMPORTED P	29.4	32.9	24.7	13.2	24.7	25.0

Annual rate of inflation for construction cost is from the mean among housing, fuel, transport wage to give 15.5% lower than the farmers ougrain price, 23 Thus, inflation raises price level of agricultural produere no cost price squeeze has been observed in rice ption, because ia cash crop. All these are taken into account for assessing the impact of inflation on benefit - cost flows.

ANNUAL INFLATION RATE FOR CROP BEN= 23.3 % - 6.8 % = 15.5 %
D.O. FOR CONSTRUCTION COST AND CONNCIES = 15.5 %

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