I.4 Social Impact Assessment

(1) Increase in employment opportunity

The project implementation will increase employment opportunity at several phases in the Project area. The increase in cropping area and agricultural productivity will require more farm labor inputs of which annual incremental requirement in the future (W) project condition is estimated at 7.37 million man-day (additional 24,600 persons' employment as for 300 working days). The project works will accrue construction labor employment of 8.6 million man-day in seven years (1.23 million man-day per year). In addition, increased production will accelerate agro-based industries and marketing activities which will increase employment opportunity.

(2) Improvement of regional transportation

Beside the direct benefit from farm road development, traffic condition outside the Project area will be improved by easy accessibility to D. I. Khan city and other regional markets and prospective road network linked with the project road along the main canal.

(3) Impact of Project growth center

The Project will cover the construction of 25 growth centers at the respective head of distributary covering administration, education, health, processing, marketing, recreation functions. Social and economic impacts through promotion of agriculture and agro-based industries, improvement of medical and educational services, settlement of young generation in the area, etc. will be expected by the center development.

(4) Increase in land value and enlargement of income disparity

Financial value of farm and residential land will be suddenly increased by the Project implementation. It will increase the value of land assets as a mortgage and the large land owners will have more monetary power in the future. On the contrary, small farmers will be hard to acquire farm lands due to increase in land prices. It is assumed that income disparity between small and large farmers be enlarged. Promotion of agrarian reform, especially the land transfer of absentees to small and tenant farmers, improvement of leasehold tenancy (change from present share tenancy to fixed rent), increase in non-agricultural year-round employment, etc. will be indispensable for the Project implementation. In order to assure status and rights of tenant and small scale farmers as members of farmer association and to be fully involved in the association's activities, special support services are also important.

TABLES

(Import Substitution Value, 1994 Constant Price) Economic Price Structure for Wheat, 2005 **Table I.2.2.1**

Item	Operation	Unit	Price Wheat
Projected price		US\$Aon	154
Canadian No.1, Western red spring /_a			
2 Ocean freight and insurance	+	US\$/ton	8
3 CIF Karachi price	u	USSAon	35
US\$=Rs.	30.0	Rs.Aon	5,520
4 Port charge, storage and other cost / b	+	RsJton	467
S Rail/road transport, Karachi-D.I.Khan /_c	+	Rs./ton	552
6 NWFP incidental costs with imported wheat / b	+	Rs./ton	38
7 Value of imported wheat in D.I.Khan	И	Rs./ton	6,577
8 Transport and handling cost (threshing floor-		Rs./ton	TT.
procurement center /_d		Rs.Aon	
9 Farm gate price/threshing floor value of wheat	Ħ	Rs./ton	6,500

Note: /_a Based on World Bank Price Prospects for Major Primary Commodities, 1994-2005(June, 1994)
/_b Food Department, Peshawar, NWFP
/_c Food Department, D.I.Khan, NWFP
/_d IJCA Market Survey

(Import Substitution Value, 1994 Constant Price) Economic Price Structure for Maize, 2005 Table I.2.2.2

			CO 700
llem	Operation	Unit	Price Co
1 11S No.2 Yellow Corn. FOB Gulf ports / a		US\$hon	88
2 Ocean freight and insurance	+	USSAcon	33
1 CIF Karachi once	Ц	USSAOn	125
US\$=Rs.	30.0	Rs./ton	3,750
4 Port charge, storage and other cost /_b	+	Rs./ton	467
Selfrond transmon, Karachi-D.I.Khan / c	+	Rs./ton	552
6 Value of imported com in D.I.Khan	li	Re./ton	4,769
7 Transport and handling cost(farm gate - market) / 4	,	Rs./ton	F
8 Farm eale price	H	Rs./ton	4,692

Note: / a Based on World Bank Price Prospects for Major Prinary Commodities, 1994-2005(June, 1994)

/_b Food Department, Peshawar, NWFP /_c Food Department, D.I.Khan, NWFP /_d IICA Market Survey

(Export Partity Price, 1994 Constant Price) Economic Price Structure for Cotton, 2005 **Table 1.2.2.3**

Item	Operation	Unit	Price
			Wbear
1 Projected price		USSAoo	1,530
Outlook "A" Index, Middling, CIF Europe /_a			
2 Quality difference (14% of CIF price)		USSAon	214
3 Ocean freight and insurance	٠.	USSAon	2
4 FOB Karachi price	n	USSAon	1,237
USS*Rs.	30.0	Rs./ton	37,110
5 Port handling, warehousing, procurement and	•	Rs./ton	1.967
other costs /_b			
6 Value of lint, ginnery gate	Ħ	Rs./ton	35,143
7 Value of lint component	¥.0%	Rs./ton	5ま、11
8 Value of couon seed (62% yield) /_c	+	Rs.	3,073
9 Ginning cost /_d		Rs./ton	521.1
10 Value of seed cotton at ginnery gate	Ħ	Rs./ton	13.897
11 Transport and handling cost		Rs./ton	ጽ
(farm gate-factory) /_d			
12 Farm sale once of seed cotton	IJ	Rs./ton	13,802

Note: / a Based on World Bank Price Prospects for Major Primary Commodities, 1994-2005/June, 1994) /_d JICA Market Survey / c Based on economic price of cotton seed

(Import Substitution Value, 1994 Constant Price) Economic Price Structure for Cotton Seed, 2005 **Table I.2.2.4**

			Year 2005
Item	Operation	ia C	Pic
			Wheat
1 Projected price, Soyabean oil		US\$/ton	+ 22
Dutch Crude, FOB /_a			
2 Quality difference (50% of FOB price)	+	US\$/ton	211
3 Ocean freight and insurance	+	USS/ton	æ
4 CIF Karachi price	n	USS/ton	129
USS=Rs.	30.0	Rs./ton	20,130
5 Port handling, warehousing, procurement and	+	Rs./ton	1,057
other costs /_b			
6 Transport, handling, and other costs,	+	Rs./ton	563
Karachi - Oil mill in D.I.Khan /_c			
7 Ex-mill value of cotton seed oil	и	Rs./ton	21,750
8 Conversion from oil to cotton seed	10%	Rs./ton	2,175
9 By-product (corton seed cake, 85%)	+	% %	3.101
10 Crushing and transport cost		Rs.100	320
11 Ex-ginnery value of cotton seed	ш	Rs./ton	4,956

Note: La Based on World Bank Price Prospects for Major Primary Commodities, 1994-2003-0 June, 1994)
Lb Trade Corporation of Pakistan (Estimated at 5.25% of CIF excluding transfer payment
Le JICA Market Survey

/_d Market cake price of Rs. 4,054/ton is adjusted by SCF of 0.9.

Economic Price Structure for Sunflower Seed, 2005 **Table I.2.2.5**

(Import Substitution Value, 1994 Constant Price)

Year 2005

Projected price, Soyabean oil Durch Crude, FOB La Durch Crude, FOB La Durch Crude, FOB La Quality difference (5% of FOB price) + US\$/lon 21 3 Ocean freight and insurance + US\$/lon 36 4 CIF Karachi price US\$-Rs. 30.0 Rs./lon 14,370 5 Port handling, warehousing, procurement and + Rs./lon 14,370 5 Fort handling, and other costs + Rs./lon 14,370 6 Transport, handling, and other costs + Rs./lon 15,687 7 Karachi - Oil mili in D.I.Khan c = Rs./lon 5,334 8 Conversion from sunoil to sunflower seed 24 Rs./lon 2,700 10 Oil extraction cost c Rs./lon 1,107 11 Farm gate price of sunflower seed Rs./lon 6,927 12 Farm gate price of sunflower seed Rs./lon 6,927 13 Farm gate price of sunflower seed Rs./lon 6,927 14 Farm gate price of sunflower seed Rs./lon 6,927 15 Farm gate price of sunflower seed Rs./lon 6,927 16 Farm gate price of sunflower seed Rs./lon C Rs./lon C Rs./lon 17 Farm gate price of sunflower seed Rs./lon C Rs./lon 18 Farm gate price of sunflower seed Rs./lon C Rs./lon C Rs./lon 18 Farm gate price of sunflower seed Rs./lon C Rs./lon 19 Farm gate price of sunflower seed Rs./lon C Rs./lon 19 Farm gate price of sunflower seed Rs./lon C Rs./lon 10 Farm gate price of sunflower seed Rs./lon C Rs./lon Rs./lon C Rs./lon C Rs./lon C Rs./lo	ltem	Operation	Unit	Price
ce) + USS/ion + USS/ion = USS/ion USS=Rs. 30.0 Rs./ion rement and + Rs./ion s. + Rs./ion er seed 34% Rs./ion 5,7 wer seed) /_c + Rs./ion 7,7 = Rs./ion 11,1	Perinted price Countres Al		1155600	727
ce) + US\$/ton + US\$/ton + US\$/ton = US\$/ton = US\$/ton	Dutch Crude, FOB / a		10000	774
+ US\$ton = US\$Aon US\$=Rs. 30.0 Rs./ton rement and + Rs./ton s. + Rs./ton = Rs./ton treed 34% Rs./ton wer seed 34% Rs./ton = Rs./ton 2. Hs./ton 2. Hs./ton 2. Hs./ton 2. Hs./ton 3. Hs./ton 4. Rs./ton 5. Hs./ton 6. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 7. Hs./ton 6. Hs./ton 6. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton 7. Hs./ton 6. Hs./ton	2 Quality difference (5% of FOB price)	+	US\$/ton	21
USS=Rs. 30.0 Rs./ton 14, rement and + Rs./ton 14. s. + Rs./ton 15, et seed 34% Rs./ton 5, wer seed) /_c + Rs./ton 2, resed 14% Rs./ton 6, reservences 14, res./ton 6, reservences 15, res./ton 6, reservences 15, res./ton 6,	3 Ocean freight and insurance	+	US\$/ton	36
USS=Rs. 30.0 Rs./ton rement and + Rs./ton s. + Rs./ton er seed 34% Rs./ton wer seed) /_c + Rs./ton Rs./ton Rs./ton = Rs./ton = Rs./ton	4 CIF Karachi price	II	US\$/ton.	479
s. + Rs./ton s. + Rs./ton er seed 34% Rs./ton wer seed) _c + Rs./ton Rs./ton = Rs./ton = Rs./ton	USS=Rs.	30.0	Rs./ton	14,370
s. + Rs./ton = Rs./ton or seed 34% Rs./ton war seed) _c + Rs./ton = Rs./ton = Rs./ton	5 Port handling, warehousing, procurement and	+	Rs./ton	754
s. + Rs./ton = Rs./ton er seed 34% Rs./ton wer seed) /_c + Rs./ton = Rs./ton = Rs./ton	other costs /_b			
= Rs./ton er seed 34% Rs./ton wer seed) /_c + Rs./ton = Rs./ton = Rs./ton	6 Transport, handling, and other costs.	+	Rs./ton	563
= Rs./ton er seed 34% Rs./ton wer seed) /_c + Rs./ton = Rs./ton = Rs./ton	Karachi - Oil mill in D.I.Khan / c		-	
er seed 34% Rs./ton wer seed) /_c + Rs./ton - Rs./ton = Rs./ton	7 Ex-mill value of sunoil	IJ	Rs./ton	15,687
wer seed) /_c + Rs./ton - Rs./ton = Rs./ton	8 Conversion from sunoil to sunflower seed	34%	Rs./ton	5,334
Rs./ton	9 By-product (meal per ton of sunflower seed) /_c	+	Rs./ton	2,700
≖ Rs./ton	10 Oil extraction cost /_c		Rs./ton	1,107
	11 Farm gate price of sunflower seed	Ħ	Rs./ton	6,927

Note: /_a Based on World Bank Price Prospects for Major Primary Commodities, 1994-2005(June, 1994) 1.b Trade Corporation of Pakistan (Estimated at 5.25% of CIF excluding transfer payment. 1.c JICA Market Survey

/_d National Oilseeds Development Board, Ministry of Agriculture Market meal price of Rs. 3,000/ton is adjusted by SCF of 0.9.

Economic Price Structure for Sugar, 2005 (1994 Constant Price) **Table I.2.2.6**

	item	Operation	Unit	Year 2005 Price Wheat
I. Import Sub	I. Import Substitution Value			
	1 Projected price	i C	US\$/ton	313
	13 A daily price, FUB and Stowed at greater Canbbean ports /_a	r Canbbean ports /_a		
	2 Ocean freight and insurance	+	USS/ton	Ε.
	3 CIF Karachi price	II.	USS/ton	24°
	US\$=Rs.	30.0	Rs./ton	10,320
	4 Port charge, handling, sampling, and	+	Rs./ton	617
	5 Road transportand handling cost, Ka	+	Rs./ton	563
	6 Ex-mill value of sugar		Rs./ton	11,500
	7 Processing cost per ton of sugar		Rs/ton	2.932
	8 Conversion to sugar cane	8.4%	Rs./ton	022
	9 Transport and handling cost (farm ga	t,	Rs./ton	77
ī	10 Farm gate price	11	Rs./ton	E
II. Export Parity Price	ity Price			
,	1 Projected price		11SS/Ion	E
	ISA daily price, FOB and stowed at greater Caribbean ports / a	Caribbean ports / a		rie.
	2 Occan freight and insurance		USS/lon	7
	3 FOB Karachi price	н	USS/ton	. &c
	USS=Rs.	30.0	USS/ton	8 460
	4 Port charge, handling, sampling, and		Rs/ton	534
	5 Road transportand handling cost, Ka		Rs./ton	315
	6 Ex-mill value of sugar	DF	Rs./ton	7,611
	7 Processing cost per ton of sugar	1	Rs./ton	2.932
	8 Conversion to sugar cane	8.4%	Rs./ton	393
	9 Transport and handling cost (farm ga		Rs./ton	t
= .	10 Farm gate price		Rs./ton	316
III. Average Value	ine		Rs./ton	480

La Based on World Bank Price Prospects for Major Primary Commodities, 1994-2005(June, 1994)
Lb Trading Corporation of Pakistan (Included storage losses with 0.5% of CIF price)

/_c JICA Market Survey

Table I.2.2.7 Economic Price Structure for Fertilizer, 2005 (Import Substitution Value, 1994 Constant Price)

			Year
Item	Operation	Unit	2005 Price
I. UREA		,	11100
1. Bagged price, FOB N.W. Europe/_a		US\$/ton	148
2. Ocean freight and insurance	+	US\$/ton	25
3. CIF Karachi price	=	US\$/ton	173
US\$=Rs.	30.0	Rs./ton	5,190
4. Port charge, handling and warehousing, etc./_b	+	Rs./ton	170
5. Transport and handling cost, Karachi - D.I.Khan/_c	+	Rs./ton	586
6. Marketing and dealers' cost/_a	+	Rs./ton	117
7. Transport and handling cost, dealer - farmer/_d	+	Rs./ton	77
8. Farm gate price	=	Rs./ton	6,140
(Nutrient; Nitrogen)	46%	Rs./kg	13.3
(Ammonium Sulfate)	21%	Rs./kg	2.8
II. TSP			•
1. Bulk export price, FOB US Gulf ports/_a		US\$/ton	137
2. Ocean freight and insurance	+	US\$/ton	40
3. CIF Manila price/_2	=	US\$/ton	177
US\$=Rs.	30.0	Rs./ton	5,310
4. Port charge, handling and warehousing, etc./_b	+	Rs./ton	170
5. Transport and handling cost, Karachi - D.I.Khan/_c	+	Rs./ton	586
6. Marketing and dealers' cost/_a	+	Rs./ton	117
Transport and handling cost, dealer - farmer/_d	+	Rs./ton	77
8. Farm gate price	=	Rs./ton	6,260
(Nutrient ; Phosphorus)	46%	Rs./kg	13.6
III. MURIATE OF POTASH			
1. Bulk export price, FOB Vancouver/_1		US\$/ton	109
2. Ocean freight and insurance	+	US\$/ton	53
3. CIF Manila price/_2	=	US\$/ton	162
US\$=Rs.	30.0	Rs./ton	4,860
4. Port charge, handling and warehousing, etc./_b	+	Rs./ton	170
5. Transport and handling cost, Karachi - D.I.Khan/_c	+	Rs./ton	586
Marketing and dealers' cost/_a	+	Rs./ton	117
7. Transport and handling cost, dealer - farmer/_d	+	Rs./ton	77
8. Farm gate price	= ,	Rs./ton	5,810
Ajusted to Sulfate of Potash		Rs./ton	4,842
(Nutrient ; Potassium)	60%	Rs./kg	9.7

Note: /_a Based on World Bank Price Prospects for Major Primary Commodities, 1994-2005(June, 1994)

[/]_b Fertilizer Imports Department. Ministry of Food and Agriculture, Karachi

[/]_c National Logistic Cell (NLC), Karachi

[/]_d JICA Marketing Survey

Table I.2.2.8 Financial and Economic Farm Gate Prices of Agricultural Inputs and Outputs

		0					
	Unit	1994	2005		Unit	1994	2005
Item		Financial Price	Economic Price	Item		Financial Price	Economic Price
Cereals				Seed/Seedling			
Wheat	Rs./kg	3.50	6.50	Wheat	Rs./kg	5.90 =	5.90
Maize(seed)	Rs./kg	4.33	4.69	Maize	Rs./kg	4.64 =	4.64
Maize(seed/fodder)	Rs./kg	4.02	4.35	Bajra (Millet)	Rs./kg	7.95 =	7.95
Baira (Millet)	Rs./kg	4.86 =	4.86	Jowar (Sorghum)	Rs./kg	8.08	8.08
Jowar (Sorghum)	Rs./kg	4.18	4.18	Barley	Rs./kg	4.50 =	4.50
Barley	Rs./kg	3.40 =	3.40				
				Mung	Rs./kg	12.00 =	12.00
Pulses Mino (whole)	Re Aco	9.45 =	9.45	Oram Black	NS./Kg	= 00.71	7.71
Gram Black (whole)	Rs./kg	9.92 =	9.92	Rape and Mustard Sunflower	Rs./kg Rs./kg	12.00 = 20.00	12.00
Oil Seeds							
Rape and Mustard	Rs./kg	7.60 =	7.60	Sugarcane	Rs./kg	0.45 =	0.45
Sunflower	Rs./kg	7.00	6.93	Cotton	Rs./kg	8.25 =	8.25
Sugarcane	Rs./kg	0.35	0.48	Brinjals (Eggplant)	Rs./kg	400.00 =	400.00
Seed Cotton	Rs./kg	9.80	13.80	Caundower	NS:/Ag	#50.00 =	430.0
	1	٠		Mangoes	Tree	30.00 =	30.00
Vegetables Driniale (Examination)	De Aca	317_	3 17	Ending (Bornom)	Do 1/50	75.00 =	35.00
Cauliflower	Rs./kg	3.36 =	3.36	Guara	Re /kg	5.25	30.52
	0) }					i
Fruits				Fertilizer	-		
Mangoes	Rs/kg	10.25 =	10.25	Urea	Rs./kg	4.68	6.14
				TSP	Rs./kg	3.92	6.26
roader Todder (Maize)	D: 1/4	1,0	0.13	SOF	KS./KB	3.90	4.84
Foder (Berseem)	Rs /kg	0.25	0.25	A gro-chemical			
Fodder (Millet/Sorghum)	Rs./kg	0.20	02.0	Insecticide	Re Ara	35.00 =	35.00
Guara	Rs./kg	4.00 =	4.00	Pesticide	Rs./lit.	250.00 =	250.00
By-Products				Labor	Rs./day	20.00	44.00
Wheat Straw	Rs./kg	0.50 =	0.50				
Maize	Rs./kg	0.20 =	0.20	Machinery and Animal Power			
Mung	Rs./kg	0.25 =	0.25	Land preparation	Rs./hour	75.00 =	75.00
Gram	Rs./kg	0.20	0.20	Drill for sowing	Rs./hour	75.00 =	75.00
Cooton	Rs. Ars	0.25	0.25	Threshing by tractor	Rs./hour	= 00.02	70.00

Table 1.2.2.9 Economic Crop Budget under without Project Condition (1/2)

		· WHEA	Ruséd	Asea	Roll Koh	iAKI	Imagio	Ares	- SORG		Art	Rod Koh	Area	Inigation	Arca .
12-01	Unit		Deserting	Amount	Quantity	Amount	Quantity	Assount (Rr.)		Quantity	Amount (Rr.)	Quantity	Amount (Re.)	Quantity	Ameun (Ra)
GROSS RETURN				(Rus)		(Rs)		(RF.)			(RI.)		(XII)		(RA)
Production	(kg)	5.50	950	6,175	970	6,305	2.020	13.130	4.58	700	2,926	740	3,093	790	3.307
By Products (straw)	(kg)	030	1,045	523 6.695	1,067	534 <u>6.839</u>	2,222	1,131 <u>24,241</u>			2,926		3.093		130
RODUCTION COST															
Farm Impute 1. Secds	(kg)	5.99	74.2	438	85 5	524	91.5	540	8.06	19.8	160	20.3	164	29.5	236
. 2. FYM/Compose	(KNM)	50							50						
3. Fertilizer								_							
- Urea (N : 46%) - TSP (V : 46%)	(kg) (kg)	6 14 6.26					150 175	921 783	6.14 6.26						
- SOP (K : 50%)	(kg)	4.84							4.84						
4. Agra-chemicula															
- Insecticides	(kg)	35							35						
- Penticide <u>Sub-1012</u>	(lit) .	250		438		\$24		2.242	250		160		164		23
				2.2				~~~					_		_
Machinery and America Powe		75.0	3.2	240	3.2	249	7.5	363	15.0	2.4	180	2.9	218	5.1	38
Land preparation Drill for sowing	(hrs) (hrs)	75 G	3.0	725	3.0	225	3.0	225	15.0			•			•
3. Threshing by tractor Sub-total	(has)	70.0	2.0	140	2.4	168 633	5.2	364 1.152	70.0		180		218		3.5
SMEIGH				402		212		1137			100		710		20
Labor	(mm-day)	44	11.0	461	14.9	614	22.0	966	44	7.0	306	90	396	71.0	M
Miscellaneous															
5 % of above cont .				26		82		218			32		39		
Total Production Con				1.603		1.862		4.381			580		816		يللا
Net Return per IIa	(Rs)			5,094		4.977		9.660			2,246		2,277		2.1-
		- OILS	ED (Mw	larð) -					- MILL	ET-					
		Unit	Rainfe	4 Area		hi Arca		an Area	Unit		d Area	Rod Ko		Irrigatio	
[lems	Umit	Price	Quantity	(Rs.)	Quantity	Amount (Re.)	Quantity	Antoent (Its.)	Prise	Quantity	Assourt (Ra.)	Quantity	Amount (RL)	Quantity	Arece (Ra.
GROSS RETURN															
Production	(kg)	7.60	500	3,800	530	4,028	540	4,104	4.86 0.20	750 1,125	3,645 125	770 1,155	3,742 231	780 1,170	3,3 2
By Products (straw)	(kg)			2800		4.028		4.104	V-20	1,125	3.870	.,,,,,	1973	••••	4.0
PRODUCTION COST															
Farm Inputs 1. Social	(kg)	12.00	10.8	130	8.5	102	8.7	104	7.95	17.4	138	15.9	126	23.7	11
									••						
2. FYM/Compose	(sons)	50							50						
3. Fertiliser															
- Urce (N : 46%) - TSP (P : 46%)	(kg)	6.14 6.26							6.14 6.36						
SOP (K: 50%)	(kg) (kg)	4 84							434						
4. Agro-chemicals - Insecticides	(kg)	35							35						
· Penicide Substant	(lit)	250						104	250		138		126		1
ancore.				130		102		7752			176		776		•
Machinery and Animal Pow		75.0	2.5	158	5.0	375	5.3	396	75.0	2.1	158	4.4	330	5.4	
Land preparation Drill for nowing	(hes)	75.0	13	100	3.0	3/3	7.7	370	75.0			***	,,,,		
 Threshing by Bactor Substoral 	(MA)	70.0				375		394	70.0		358		330		4
This Table				185		212		223			146				
Labor	(p=4y)	44	סוג	434	12.0	528	110	272	44	#T0	352	12.0	528	18.0	1
Misocillateous															
5 % of above court				40		59		뀸			32		49		
Total Production Cost				Mi		1.051		1.128			680		1.034		غيا
Net Rétorn per Ha	(Rs.)			2.959		2,973		2.976			3.190		2,940		2_
		- GRA							- GUA						
irm.	Uat	Unut	Rainfe Quantity	Azvenia Azvenia		Arecent	brigat Openity	Ancent	Unit Prior	Cuseily	Amount	Red Ke Overtity	Amount	Image Quantity	
	<u></u>	_los_		(Nu.)	- Cannot	(Re)	×44:3-1	(Ra.)			(Ru.)		(Ra.)		(R
OROSS RETURN	(k=)	9,92	600	5,952	600	5,952	640	6,349	4.00	1.509	6.000	1,630	6.520	1,900	7,
Production By Products (straw)	(kg) kg}	9.92	960	3,932	600	3,931	(HU)	0,347	1.00	12700	2.000	1,020		1.100	
				5.952		5.95		6.349			6.900		6.570		2.
PRODUCTION COST Familiapato															
1. Norde	(kg)	\$2.00	46.1	556	43.2	SIR	30.0	600	5.25	189	94	20.0	105	20.0	
2 FYM/Composi	(lotes)	50							50						
		30											•		
3. Fertilizer • Urea (N : 40%)	A-1	6 14							5.24						
- Urea (81: 46%) - TSP (P: 46%)	(kg) (kg)	6 76							6.26						
SOF(K: 30%)	(kgi	4.34							4.84						
4. Agro-chemicals															
· Insectionies	(kg)	,15							35						
- Pesticul <u>Sub-total</u>	Ha i	219		550		518		640	250		20		107		j
				क्या		210		***			-				
		37.0					63	474	75.0	5.7	42%	5.7	424	61	
Machinery and Annual Pow	(ture)	75 G 75 G	37	428 165	5.7 7.2	428 165	6.3 2.5	388	25.0	20	150	20	130	2.5	
L. Land proparation	(lize)		- •						76 ()						
1 Land preparation 2 Dull for sowing 1 United in by that for	(lize) (lete)	70 0						(42)			376		<u> 17×</u>		,
1 Land preparation 2 Drift for sowing		70 0		227		500		~					_		
1 Land preparation 2 Dull for sowing 1 United in by that for		700	<u>tler</u>	221 221	11so	441	מקו	w	41	25.0	TTREE	旅布	بالاللة	40.tr	1.
Land preparation Drift for sowing Hitestring by tracted <u>Sub-total</u> Ealors	(lets-I		the		iw		מקו		44	<u>25.0</u>		辣布		<u> 40.t</u>	L
1 - Land preparation 2 - Duil to: wwity 4 - Thiesbury by Warfer <u>Anti-Land</u>	(lets-I		<u>tlee</u>		iw		עלו		#1	<u>25.0</u>		预介		<u> 10.t</u>	1.
Land preparation Drift for owning Thirebring by tracker Anterior Anterior Enters Miscellaneous	(lets-I		<u>tte</u>	440	iio	報	תקו	œ	44	<u>25.0</u>	ma	旅市	<u>i 170</u>	<u> 40.0</u>	

Table I.2.2.9 Economic Crop Budget under without Project Condition (2/2)

· · · · · · · · · · · · · · · ·		Unit	VECETAL AND AND			AS		- COTT	Red Kel	Area		The same		
General Control of C	Upin	Prior	Quantity	(Ra.)	Occasiny		Ile)	Prior	Quantity	Amount (fu.)	0	Density	Americant (R4.)	
KOSS RETURN														
Production By Products (straw)	(kg) (kg)	3.36	4.000	13,440	4,200	-	14 112	13.80 0.25	1,300 650	17,940 163		1,540 170	21,252 193	
-	·-#.			13.440			4.112			18,103			21.445	
CODUCTION COST														
1. Section	(kg)	450	7.0	3,150	7.0		3,150	6.25	€0.0	330		40.0	330	
2. FYM/Composi	(sons)	50						50						
2: 1 po (2 mpcm)	(1010)							~						
3. Fertilizer + Urea (N : 46%)	ab a)	6.14						6.14	125	768		125	768	
- TSP (P : 46%)	(kg) (kg)	6 25						6.26	1.5	/00		123	/00	
- SOP (K : 50%)	(kg)	4.84	**					4.84						
4. Agro-chemicals														
- Inecalaides	(kg)	35						35						
- Penticide <u>Sub-total</u>	(lir)	250	•	3.150			3,150	250	ı	250 1.348		2	500 1,595	
													2442	
Machinery and Animal Por 1. East preparation	(NA)	75.0	5.0	375	5.0		375	75.0	7.0	525		7.0	525	
2. Drill for sowing	(kre)	75.0	2.0	213	3.4		3/3	75.0		3.5			323	
 Threshing by tractor Sub-total 	(hrs)	20.0		105				70.0						
38344				3.75			375			525			525	
Labor	(man-day)	44	65.0	2.860	68.0		2.992	44	65.0	2.860		79.9	3.060	
Misorliancous														
5 % of above cost				318			326			237			260	
Total Production Cost				6.704			6843			4.969			5.463	
ASSESSMENT				<u> </u>						1202			2200	
Net Return per Ha	(R4.)			6,736			7.269			13.133			15,962	
		- RAR	PODDER	_	- KARIF	FODDE	t-	- KHAI	KIP VEGE	TABLES -				
······································	· · ·	Uest	lgium	d Ars	Call	imean d	ARI	Unit	Red Ko	N Area		Inters		
lectus	Veiz	Pries	Owner	ARCHI.	_hia_C	pantity (_ Price	Quantity	Amount		James ty	Amount	
GROSS RETURN				(R#.)			(Ra.)			(K#)			(Na.)	
Production By Products (straw)	(kg)	0.25	13,300	3,325	0.20	11,860	2.372	3.17	2,300	6,974		2,490	7,608	
				3.325			2.372			6.974			2.606	
PRODUCTION COST Farm Inputs														
1. Scods	(kg)	25.00	15	385	4.64	19.6	91	400.00	3.0	1.200		3.0	1,200	
) FYW/C	*****	50			***									
2. FYM/ Compost	(1000)	50			50			50						
3. Fereitimer														
- Uma (N : 46%) - TSP (P : 46%)	(kg) (kg)	6.14 6.26			6.14 6.26			6.14 6.26						
- SOP (K : 50%)	(kg)	4.64			4.84			4.84						
4. Agro-chemicals														
- Instruccioldes	(kg)	35			35			35						
- Praticide Sab-total	(tit)	150		385	250		91	250		1.200			1.700	
				_			_							
Machinery and Animal Po- 1. Land Preparation	(hre)	75.0	6.1	458	75.0	6.1	456	75.0	5.0	375		5.0	375	٠.
2. Drill for coming	(hrs)	75.0	•		75.0			75.0	2.0	3.3		3.2	2.0	
J. Thereshing by tractor Sub-tage	(hay)	70.0		435	70.0		438	70.0		375			375	
										سبد			14	
Labor	(man-day)	44	32.0	1.405	섚	75.0	1.100	44	#8.0	2.112		53.0	2,332	
Misoclianopes														
5 % of above cost				1115			82		-	154			192	
Total Production Cost				2.363			1.731			1871			4.102	
Nei Return ner Ha														
bei Keinti bet Lit	114.}			962	`		641			3.193	-		3,506	
			O BEANS		- MAIZ	e-		- SUG	ARCANE		Frui	i (mango)-	
Same a	T feels	Unit		d Arta		Irriamics		Unii		AART			Cd.A254	
News .	Unit		Owanticy	(Kr.)	zid	MARKET .	(Ks.)	Price	Quantity	ABORNI (Ka.)	_Cht_	Quantity	Amcont (Ra.)	NEY 1
GROSS RETURN Production	41.5	9,45	520		,									
Production By Products (straw)	(kg) (kg)	9,45	320	4,914	4.35 0.20	630 945	2,341 189	0.46	35.55	17,064	ĮŲ.25	13.000	133,250	
				4.514			2.910			17.064			133,250	(6.7
PRODUCTION COST													(6.760)	
I. Seeds	(kg)	12.00	\$0.0	600	4.64	368	171	0.45	7.950	3.578	30.00	51.0	1,530	
2. FYM/ Composit	(IOHI)	.50			50			30			50 0	15.0	750	
								***			200		,,,,	
3 Pershaer - Urea (N : 46%)	(kg)	6.14			6 14	125	764	614	225	1,3%2	6.14	1,600	9,834	
TSP (P : 46%)	(FK)	676			626	123	100	6.26	150	934	6 26	1,700	1,512	
- SOF (K : 50%)	Ogi	4 144			4,84			4.64			4.84	800	3,872	
4 April chemicals														
- laur strende » - Pentende	(kp)	35 110			15			33			35	400	14.000	
- Perfecte Sub-total	thi i	210		400	250		<u> 118</u> .	750	'	5,805	250	16	4,000 41,446	ıL.

Machinery and Amunal is 1 Land Preparation	(firs)	75.0	6.1	171	75.0	18	4.95	750	4.9	.KA	75.0	10.0	150	
2. Ords for somply	(hrs i	73 0	2.5	184	350	**	4.7.1	25.0	5.1	, RA.	75.0	1U.H	730	
i Dacdany by Iracles Sub-total	(hts)	7u 0	60	420	7ú ti			20 0			70 O			
<u> २४%-५४४</u>				1.180			4112			Lly			250	
Later	filtari-daj)	44	15.0	962	42	<u>18 u</u>	197	44	<u>28.0</u>	2.552	44	42.0	2.00-6	ų.
Miscellanceus														
5 fe of alone cost				111			104			47.			2.215	(
				2457			2224			244			فنشنط	u.
										11196				144
Teral Destination Unit	fKs I													

Table I.2.2.10 Economic Net Crop Production Value under without Project Condition

		Iminoted Area	04		Rod Kohi Area	2		Rainfed Area	or		Total Area	
		Unit	Total		Unit	Total		Unit	Total		Unit	ZG
CCA 101 800 ha	Cropping	Production Value	Production Value	Cropping Area	Production Value	Production Value	Cropping Area	Production Value	Production Value	Cropping Area	Production Value*	Production Value
TOTAL TOTAL	(ha)	(Rs./ha)	(Rs. ,000)	(ha)	(Rs./ha)	(Rs000)	(ha)	(Rs/ha)	(Rs. ,000)	(ha)	(Rs./ha)	(Rs. ,000)
Kharif Season Crops Sorghum	10	2,142	21.4	1,310	2,277	2,982.9	1,120	2,246	2.515.5	2,440	2,260	5.519.8
Millet	10	2,570	25.7	1,010	2,940	2,969.4	1,370	3,190	4,370.3	2,390	3,080	7.365.4
Maize	20	959	13.1	0	0	0.0	,00	0	0.0	20	099	13.1
Pluses	10	2,457	24.6	0	0	0.0	00	0	0.0	10	2,460	24.6
Sugarcane	30	0	0.0	0	0	0.0	0	0	0.0	30	O	
Cotton	40	15,982	639.3	20	13,133	262.7	0	0	0.0	8	15,030	901.9
Fodder	10	\$	6.4		0	0.0	0	0	0.0	10	64 0	6.4
Guara	10	4,949	49.5	70	4,417	309.2	130	4,134	537.4	210	4,270	896.1
Vegetables (Eggplant)	10	3,506	35.1	20	3,103	62.1	0	0	0.0	30	3,240	97.1
Sub-total	150	-	815.1	2.430		6.586.2	2,702		7.423.2	5,200		14.824.5
Rabi Season Crops Wheat	059	9,660	6,279.0	4,900	4.977	24,387.3	2,950	5,094	15,027.3	8,500	5.380	45.693.6
Pulses (Gram)	160	4,333	693.3	1,970	4,324	8,518.3	2,150	4,284	9,210.6	4,280	4,300	18,422.2
Oilseeds (Rape/Mustard)	1) 20	2,976	59.5	1,380	2,973	4,102.7	1,000	2,959	2,959.0	2,400	2,970	7,121.3
Sugarcane	30	8,716	261.5	0	0	0.0	0	0	0.0	30	8.720	261.5
Fodder (Berseem)	99	962	57.7	0	0	0.0	0	0	0.0	8	096	57.7
Fruits	ν,	3,670	18.4	10	3,670	36.7	0	0	0.0	15	3,670	55.1
Vegetables, others	ν.	7.269	36.3	10	6,736	67.4	0		0.0	15	6.910	103.7
Sub-fotal	930		7.405.7	8.270		37.112.4	00179		27.196.9	15.300		21.715.0
Kharif Season Crops Rabi Season Crops Total	150 930 1.080		815.1 7.405.7 8.220.7	2,430 8,270 10,700		6.586.2 37,112.4 43,698.6	2,702 6,100 8,802		7,423.2 27,196.9 34,620.1	5,200 15,300 20,500		14,824.5 71,715.0 86,539.4
Demarks Ref Table 12	¥	od sversoe of	Weighted sverses of unit onchicity value	1 value		Arra Parisi	-					

Table I.2.2.11 Economic Crop Budget under with Project Condition

lians:	Ueb	Unit .	Whe			Unit	Maiz		Unit	Maize (Unit	Pituses (Unit		(Grain)
ltens	Unit	Price	Quantity	Amount (Rs.)		Prior	Quantity	Amount (Rs.)	Price	Quantity	Ariciuni (Rs.)	Price	Quantity	Amount (Rs.)	Price	Quantity	Amoun (Rs.)
ROSS RETURN	A-1	, e en	4,000	26,026		2 46 -	3 500			2 560							
Production By Products (atraw)	(kg) (kg)	6.50 0.50	4,400	26,000 2,200	•	4.35 0.20	3,500 5,250	15,225	4. 69 0.20	3,500 5,250	16,415 1,050	9.45 : 0.25	2,000 1,000	18,900 250	9.92 0.20	2,000 1,000	19,844 20
			(x 1.1)	28.200			(x 1.5)	16.275	•	(x 1.5)	17.465		(x 0.5)	19.150	-,	(x 0.5)	20.04
RODUCTION COST Fazin Inputs																٠,	
1. Seeds	(kg)	5.90	100.0	590		4.64	30.0	139	4.64	30.0	139	12.0	100.0	1,200	12.0	60.0	72
2. FYM/ Compost	(tons)	50	5.0	250		50	5.0	250	50	5.0	250		5	-,	50	1	
3. Fenilizer			225				***									ti.	100
- Urea (N : 45%) - TSP (P : 46%)	(kg) (kg)	6.14 6.26	225 150	1,382 939		6.14 6.26	200 125	1,228 783	6.14 6.26	200 125	1,228 783	6.14 6.26	100 125	614 783	6.14 6.26	125 125	. 76
- SOP (K: 50%)	(kg)	4.84	125	605		4.84	112	703	4.84	12.	147	4.84	14.5	163	4,84	125	60
4. Agro-chemicals																	
Insecticide Pesticide	(kg)	35 250	10 2	350 500		35 250	10	350 500	35 250	10	350 500	35 250	10	350	35	10	35
Sub-total	(lit.)	2.0	-	4.616		40	2 .	3.250	2.10	· 2	3.250	2.30	1	250 3.192	250	1	25 34
																	_
Machinery and Animal Pov			7.0					***									
 Land preparation Drill for sowing 	(par) (par)	75.0 75.0	7.5 5.5	563 413		75.0 75.0	7.\$ 5.\$	563 413	75.0 75.0	7.5 5.5	563 413	75.0 75.0	6.0 5.5	450 413	75.0 75.0	6.0 5.5	45 41
3. Threshing by tractor	(lus)	70.0	7.0	490		70.0	***	413	70.0	***	7,5	70.0	3.3	412	70.0	J.,-	7
Sub-loral				1.465				975			275			861			86
Labor	(man day)	44	40.0	1.760		44	400	1.760	44	40.0	1.760	44	46.0	1 760		40.0	, 7
1400	(man-day)	-	240	Trings.		-	49.0	1.700		20.0	1.169)	. 44	40.0	1.760	. 44	40.0	1.76
Miscellaneous																	
5 % of above cost				392				299			299			291			30
Total Production Cost				8.233				6.284			6.284			5.110		*	6.40
Not Rotum per Ha	(Rs.)			19,967				9,991			11.181			13,040			13,6
7.42.744.747.14	(110.7			17,701	<u>_</u>			7,771			11.751			15,040			15,0.
		Unit	Sugar				Oilseeds (Rap		Unit	Oilseeds (S		Unit		der (Millet)	Unit	Rabi Fedde	
Items	Unit	Price	Quantity	Amount (Rs.)		Price	Quantity	Amount (Rs.)	Price	Quantity	Amount (Rs.)	Price	Owntity	Amount (Rs.)	Price	Quantity	Amou (Rs.
GROSS RETURN								(····)			(,			(***)			. (100.)
Production By Products (straw)	(kg)	0.48	70,000 (40,000)	33,600		7.60	2,500	19.000	6.93	2,500	17,325	0.20	45,000	9,000	0.25	55,000	13,7
by Froncis (MILW)	(kg)		ratoon	33.600 (/19.200h			19.000			17.325			9.000			13.2
PRODUCTION COST					,.,,,,,,,,			<u> </u>			11-12			2.00.0		1	سند
Ferm Inputs																	
1. Seeds	(kg)	0.45	6,000	2,700 1		12.0	7,5	90	20.00	7.5	150	7.95	15.0	119	25.0	20.0	5
FYM/Compost Fertilizer	(lors)	50	5.0	250 4	,	50			50	5.0	250	50	5,0	250	50	5.0	2:
- Urea (N : 46%)	(kg)	6.14	250	1,535		6.14	150	921	6.14	150	921	6.14	100	614	6.14	100	6
- TSP (P: 46%)	(kg)	6.26	200	1,252		6.26	125	783	6.26	125	763	6.26	50	313	6.26	125	7
- SOP (K : 50%) 4. Agro-chemicals	(kg)	4.84	150	726		4.84			4.84			4.84			4.84		
- Insecticide	(kg)	35	20	700		35	10	350	35	10	350	35			35	:10	3
- Petticide	(tit.)	250	2	500		250	2	500	250	1	250	250			250	1	2:
Sub-total				7.663	(4.713)			2.644			2,704			1.296			2.7
Machinery and Animal Po	****																
1. Land preparation	(fars)	75.0	7.5	563	•	75.0	6.0	450	75.0	6.0	450	75.0	7.5	563	75.0	7.5	5
2. Drill for sowing	(pex)	75.0				75.0	5.5	413	75.0			75.0			75.0		
 Threshing by tractor Sub-total 	(hrs)	70.0		563		70.0		163	70.0		450	70.0		462	70.0		
				202				<u>RG1</u>			450			<u>563</u>			5
£_abor	(man-day)	44	<u>80.0</u>	3.520	(2.900)	44	20.0	2,200	44	40.0	1.760	44	30.0	1.320	44	40.0	1-2
Miscellaneous																	
5 % of above cost				587							246			159			2
Total Production Cost								285									
					(rateon) 7 994						5 150			2 220			4 2
				12.333		2 years	rverage*	5.991			5.159		_	3.338			5.3
Net Return per Ha	(Rs.)			12.333	7.994	2 years 1 16,237					5.159 12.166			3.338 5,662			
	(Rs.)	Unit	Con	12.333 21,267	7.994	16,237	•	5.991 13,009	lini	Rahi Ves	12.166	Mair	Electric de	5,662			0,4
	(Rs.) Unil	Unii Price	Cor Quantity	12.333 21,267 tion Amount	7.994	16,237 Unit Price	Kharif Ve Quantity	5.991 13,009	Unit Price	Rabi Vej Quantky	12.166 ctables Amount	Unit Price	Fruits (Ann	nual Crop Bu NPV 10%	0,4
Net Return per Ha				12.333 21,267	7.994	16,237 Unit Price	Kharif Ve	5.991 13.009	Price		12.166 ctables Amount			5,662 (Mango)	Ann		0,4
Net Return per Ha	Unit			12.333 21,267 tion Amount	7.994	Unit Price	Kharif Ve Quantity (Egg plant)	5.991 13,009 egetable Amount (Re.)	Price (Quantity (Cauliflower)	12.166 ctables Amount (Ks.)	Price	Quantity	5,662 (Mango) Amount (Rs.)	Ann	NPV 10%	0,4
Net Return per Ha		Price	Quantity 2,000 1,000	21,267 tton Amount (Rs.) 27,600 250	7.994	16,237 Unit Price	Kharif Ve Quantity	5.991 13,009 egetable Amount	Price	Quantity	12.166 etables Amount			5,662 (Mango) Amount	Ave	NPV 10% (Rs.)	0,4
Net Return per Ha Itens GROSS RETURN Production By Products (#fraw)	Unit (kg)	Price	Quantity 2,000	21,267 tton Amount (Rs.) 27,600	7.994	Unit Price	Kharif Ve Quantity (Egg plant)	5.991 13,009 egetable Amount (Re.)	Price (Quantity (Cauliflower)	12.166 ctables Amount (Ks.)	Price	Quantity	5,662 (Mango) Amount (Rs.)	Ave	NPV 10% (Rs.)	0,4
Net Return per Ha liens GROSS RETURN Production By Products (Braw)	Unit (kg)	Price	Quantity 2,000 1,000	21,267 tton Amount (Rs.) 27,600 250	7.994	Unit Price	Kharif Ve Quantity (Egg plant)	5.991 13,009 secuble Amount (Re.) 31,700	Price (Quantity (Cauliflower)	12.166 artables Amount (Rs.)	Price	Quantity	5,662 (Mango) Amount (Rx.) 410,000	Aver	NPV 10% (Rs.)	0,4
Net Return per Ha Itens GROSS RETURN Production By Products (#fraw)	Unit (kg)	Price	Quantity 2,000 1,000	21,267 tton Amount (Rs.) 27,600 250	1.994 11.206	Unit Price	Kharif Ve Quantity (Egg plant)	5.991 13,009 secuble Amount (Re.) 31,700	Price (Quantity (Cauliflower)	12.166 artables Amount (Rs.)	Price	Quantity	5,662 (Mango) Amount (Rx.) 410,000	Aven	NPV 10% (Rs.)	0,4
Net Return per Ha Items UROSS RETURN Production By Products (straw) PRODUCTION COST Farm Inputs 1. Seeds 2. FyMr Compost	Unit (kg) (kg)	13.8 0.25	2,000 1,000 (x 0.5)	12.333 21,267 tion Annual (Rs.) 27,600 250 27,850	1.294 11.206	Unit Price 3.17	Kharif Ve Quantity (Egg plant) 10,000	5.991 13,009 Sectable Amount (Re.) 31,700 31,700	93.36	Quantity (Cauliflower) 15,000	12.166 ctables Amount (Re.) 50,400 \$9,400	Price 10.25	Quantity 40,000	5,662 (Mango) Amount (Rx.) 410,000 410,000	Ann	NPV 10% (Rs.)	0,4
Net Return per Ha literia DROSS RETURN Production By Products intrawj PRODUCTION COST Farm Upputs 1. Secute 2. If YM/Compost 3. Terrifizer	Unit (kg) (kg) (kg) (kg)	13.8 0.25 8.25 50	2,000 1,000 (x 0.5) 25,0 5.0	21,267 Uon Append (Rs.) 27,600 28,600 21,859 20,600 21,859	1.294 11.206	16,237 Unit Price 3.17 406 50	Kharif Ve Quantity (Egg plant) 10,000	5.991 13.009 13.009 13.009 14.000 15.	3.36 450 50	Quantity (Cauliflower) 15,000 4.5 5.0	12.166 ctables Amount (Re.) 50,400 \$0,400 675 250	10.25 30.00 50	Quantity 40,000 55.0 45.0	5,662 (Mango) Amount (Rs.) 410,000 410,000 2,250	Ann	NPV 10% (Rs.)	0,4
Net Return per Ha Hense BROSS RETURN Production By Products (straw) RODUCTION COST Farm lopols 1. Seeds 2. Fy Mf Compost 3. Fertilizer - Urea (N : 46%)	Unit (kg) (kg) (kg) (kg) (tune)	13.8 0.25 8.25 50 6.14	2,000 1,000 (x 0.5) 25,0 5,0	12 333 21.267 (ton Annount (Rs.) 27.600 250 21.859 206 250 1.228	1.294 11.206	16,237 Unit Price 3.17 406 50 6.14	Kharif Ve Quantity (Egg plant) 10,000 0.6 5.0 200	13,009 13,009 13,009 140 131,700 140 240 250 1,228	97ice (3.36 450 50	Quantity (Cauliflower) 15,000 4.5 5.0 200	12.166 ctables Amount (Re.) 50.400 \$9.400 675 250 1,228	10.25 30.00 50 6.14	Quantity 40,000 55.0 45.0 4,000	5,662 Mango) Amount (Rx.) 410,000 410,000 1,650 2,250 24,560	Ave	NPV 10% (Rs.)	0,4
Net Return per Ha liens BROSS RETURN Production By Products infrawj RODUCTION COST Farm Inputs 1. Seeds 2. FyMf Compost 3. Ferilitier - Urea IN: 46%; - NOP (K: 20%)	Unit (kg) (kg) (kg) (kg)	13.8 0.25 8.25 50	2,000 1,000 (x 0.5) 25,0 5.0	21,267 Uon Append (Rs.) 27,600 28,600 21,859 20,600 21,859	1.294 11.206	16,237 Unit Price 3.17 406 50	Kharif Ve Quantity (Egg plant) 10,000	5.991 13.009 13.009 13.009 14.000 15.	3.36 450 50	Quantity (Cauliflower) 15,000 4.5 5.0	12.166 ctables Amount (Re.) 50,400 \$0,400 675 250	10.25 30.00 50	Quantity 40,000 55.0 45.0 4,000 3,200	5,662 (Mango) Amount (Rs.) 410,000 410,000 2,250	Ave	NPV 10% (Rs.)	0,4
Net Return per Ha Itens GROSS RETURN Production By Products (Braw) PRODUCTION COST Farm Inputs 1. Seeds 2. FYM/ Compost 3. Ierifizer - Urea (N. (46%) - TSP (P. (46%) - SOP (K. (50%) 4. Agroschemicals	Unit (kg) (kg) (kg) (tone) (kg) (kg)	13.8 0.25 50 6.14 6.26 4.84	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50	12.333 21.267 (Ion Append (Re.) 27.600 250 27.859 206 250 1.22k 783 242	1.206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84		5.991 13.009 13.009 14.000 11.700 240 250 1.228 783	97ice (1) 3.36 4.50 50 6.14 6.26 4.84	Quantity Cauliflower) 15,000 4.5 5.0 200 325	12.166 ctables Amount (Re.) 50,400 59,400 675 250 1,228 783	30.00 50 6.14 6.26 4.84	55.0 45.00 45.00 45.00 55.00 45.00 55.00	5.662 Mango) Amouni (Rs.) 410,000 410,000 2.250 24,560 20,032 7,744	Ave	NPV 10% (Rs.)	0,4
Net Return per Ha Items BROSS RETURN Production By Product (Biraw) PRODUCTION COST Farm Inputs 1. Seeds 2. FyMr Compost 3. Fertilizer - Urea (N. 46%) - TSP (P. 46%) - SOP (K. 50%) 4. Agroschemicals - Insecticials	Unit (kg) (kg) (kg) (tone) (kg) (kg) (kg)	13.8 0.25 8.25 50 6.14 6.26 4.84	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50	12.332 21.267 000 Ameson (Re.) 27.600 250 22.859 206 250 1.228 783 242 700	1.206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84		2.991 13.009 13.009 14.000 15.0000 15.0000 15.0000 15.0000 15.0000 15.0000 15.0	97ice (1) 3.36 4.50 50 6.14 6.26 4.84 3.5	Quantity Cauliflower) 15,000 4.5 5.0 200 125	12.166 ctables Amount (Re.) 50,400 52,400 675 250 1,228 783	30.00 50 6.14 6.26 4.84	55.0 45.00 45.00 45.00 45.00 15.600	5,662 Mango) Amouni (Rs.) 410,000 410,002 1,650 2,250 24,560 20,032 7,744 28,600	Ann	NPV 10% (Rs.)	0,4
Net Return per Ha Itens GROSS RETURN Production By Products (Braw) PRODUCTION COST Farm Inputs 1. Seeds 2. FYM/ Compost 3. Ierifizer - Urea (N. (46%) - TSP (P. (46%) - SOP (K. (50%) 4. Agroschemicals	Unit (kg) (kg) (kg) (tone) (kg) (kg)	13.8 0.25 50 6.14 6.26 4.84	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20	21,267 21,267 (tion Annount (Rs.) 27,600 250 27,859 206 250 1,228 783 242 7(6)	1.206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84		2.991 13.009 Seciable Amount (Ra.) 31,700 240 250 1,228 783 3,501 500	97ice (1) 3.36 4.50 50 6.14 6.26 4.84	Quantity Cauliflower) 15,000 4.5 5.0 200 325	12.166 ctables Arrount (Re.) 50,400 50,400 675 250 1,228 783 3,501 1,000	30.00 50 6.14 6.26 4.84	55.0 45.00 45.00 45.00 55.00 45.00 55.00	5,662 Mango) Amount (Rs.) 410,000 410,000 2,250 24,560 20,032 7,744 28,600 10,000	Are	NPV 10% (Rs.) 21.575	0,4
Net Return per Ha liens BROSS RETURN Production By Products (straw) PRODUCTION COST Farm Inputs 1. Secut 2. Fy/M/Compost 3. Fertilizer - Urea (N. 46%) - TSP (P. 46%) - SOP (K. 50%) 4. Agro-chemicals - Insecticit - Pearinde Sub-netal	Unit (kg) (kg) (kun) (tona) (kg) (kg) (kg) (kg)	13.8 0.25 8.25 50 6.14 6.26 4.84	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50	12.332 21.267 000 Ameson (Re.) 27.600 250 22.859 206 250 1.228 783 242 700	1.206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84		2.991 13.009 13.009 14.000 15.0000 15.0000 15.0000 15.0000 15.0000 15.0000 15.0	97ice (1) 3.36 4.50 50 6.14 6.26 4.84 3.5	Quantity Cauliflower) 15,000 4.5 5.0 200 125	12.166 ctables Amount (Re.) 50,400 52,400 675 250 1,228 783	30.00 50 6.14 6.26 4.84	55.0 45.00 45.00 45.00 45.00 15.600	5,662 Mango) Amouni (Rs.) 410,000 410,002 1,650 2,250 24,560 20,032 7,744 28,600	Are	NPV 10% (Ra.) 21.575	0,4
Net Return per Ha BROSS RETURN Production By Products infraw] PRODUCTION COST Farm Inputs 1. Seeds 2. Fy Mr Compost 3. Fertilizer - Urea (N: 46%) - NOP (K: 20%) 4. Agro-chemicals - Insecticide Pesticide Pesticide Sub-netal Machinery and Animal Iv	Unit (kg) (kg) (kg) (tone) (kg) (kg) (kg) (kg) (kg) (kg)	9.25 8.25 50 6.14 6.26 4.84 35 25n	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20	21,267 21,267 21,267 000 Append (Re.) 27,600 250 27,859 206 250 1,228 783 242 7(6) 564 3,362	1.994	16,237 Unit Price 3,17 400 50 6,14 6,26 4,84 35 250		5.991 13.009 sgetable Amount (Re.) 31,700 31,700 240 250 1,228 783 3,501 500 6,501	970ce (3.36 450 50 6.14 6.26 4.84 3.5 250	Quartity Cauliflower) 15,000 15,000 4.5 5.0 200 325	12.166 caables Amount (Re.) 50,400 50,400 675 250 1,228 783 3,501 1,900 7,436	30.00 50 6.14 6.26 4.84 35 25/1	55.0 40,000 55.0 45.0 4,000 3,200 £,600 RKI 4U	5,662 Mango) Amouni (Re.) 410,000 410,000 2,250 24,560 20,032 7,744 28,000 10,000 91,236	Arr	NPV 10% (Rs.) 21.575	0,4
Net Return per Ha Items DROSS RETURN Production By Products (straw) PRODUCTION COST Farm Inputs 1. Seeds 2. Fy Mr Compost 3. Fertilizer - Urea (N: 46%) - NOP (N: 20%) 4. Agro-chemicals - Insecticity - Positicity - Positicity - Machinery and Animal Py 1. Land preparation	Unit (kg) (kg) (kun) (tona) (kg) (kg) (kg) (kg)	8.25 50 6.14 6.26 4.84 35 250	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 2	21,267 21,267 300n Append (Re.) 27,600 250 27,859 206 259 1,228 783 242 7(6) 5(6)	1.294	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84 35 250		2.991 13.009 Seciable Amount (Ra.) 31,700 240 250 1,228 783 3,501 500	975.00 975.00 975.00 975.00 975.00 975.00	Quantity Cauliflower) 15,000 4.5 5.0 200 125	12.166 ctables Arrount (Re.) 50,400 50,400 675 250 1,228 783 3,501 1,000	30.00 50 6.14 6.26 4.84 35 259	55.0 45.00 45.00 45.00 45.00 15.600	5,662 Mango) Amount (Rs.) 410,000 410,000 2,250 24,560 20,032 7,744 28,600 10,000	Ace	NPV 10% (Rs.) 21.575	0,4
Net Return per Ha Items DROSS RETURN Production By Products (Braw) PRODUCTION COST Farm Inputs 1. Seeds 2. FYM/ Compost 3. Fertilizer - Urea (N. '46%) - NSP (N. '50%) 4. Agros-temicals - Insecticity - Pesticitie - Pesticitie Sub-neud Machinery and Animal Ps 1. Land preputation 2. Drift for sowing 3. Threshing in Itemies	Unit (kg) (kg) (kg) (tunk) (kg) (kg) (kg) (kg) (kg) (kg) (kg) (k	9.25 8.25 50 6.14 6.26 4.84 35 25n	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20 20	21,267 21,267 21,267 000 Append (Re.) 27,600 250 27,859 206 250 1,228 783 242 7(6) 564 3,362	1.294	16,237 Unit Price 3,17 400 50 6,14 6,26 4,84 35 250		5.991 13.009 sgetable Amount (Re.) 31,700 31,700 240 250 1,228 783 3,501 500 6,501	970ce (3.36 450 50 6.14 6.26 4.84 3.5 250	Quartity Cauliflower) 15,000 15,000 4.5 5.0 200 325	12.166 caables Amount (Re.) 50,400 50,400 675 250 1,228 783 3,501 1,900 7,436	30.00 50 6.14 6.26 4.84 35 25/1	55.0 40,000 55.0 45.0 4,000 3,200 £,600 RKI 4U	5,662 Mango) Amouni (Re.) 410,000 410,000 2,250 24,560 20,032 7,744 28,000 10,000 91,236	Ax	NPV 10% (Rs.) 21.575	0,4
Net Return per Ha Items UROSS RETURN Production By Products (straw) PRODUCTION COST Farm Inputs 1. Seeds 2. FYM/Compost 3. Fertilizer - Urea (N: 46%) - TSP (19: 46%) - SOP (K: 50%) 4. Agro-chemicals - Insectical - Pesticide Sith-text Machinery and Animal Pc 1. Land preparation 2. Draft for sowing	Unit (kg) (kg) (kg) (tone) (kg) (kg) (kg) (kg) (kg) (kg) (da.)	9.25 8.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 2	21,267 21,267 300n Append (Re.) 27,600 250 27,859 206 259 1,228 783 242 7(6) 5(6)	1.294	16,237 Unit Price 3.17 400 50 6.14 6.36 4.84 35 250 73.01		5.991 13.009 sgetable Amount (Re.) 31,700 31,700 240 250 1,228 783 3,501 500 6,501	975.00 75.00 75.00 75.00 75.00	Quartity Cauliflower) 15,000 15,000 4.5 5.0 200 325	12.166 caables Amount (Re.) 50,400 50,400 675 250 1,228 783 3,501 1,900 7,436	30.00 50 6.14 6.26 4.84 35 25/1	55.0 40,000 55.0 45.0 4,000 3,200 £,600 RKI 4U	5,662 Mango) Amouni (Re.) 410,000 410,000 2,250 24,560 20,032 7,744 28,000 10,000 91,236	Are	NPV 10% (Rs.) 21.575	0,4
Net Return per Ha Items IROSS RETURN Production By Products (straw) PRODUCTION COST Farm Jopols 1. Seeds 2. FyMr Compost 3. Fertilizer - Urea (N: 46%) - TSP 11% 46%) - TSP 11% 46%) - SOP (R: 50%) 4. Agro-clienticals - Insecticals - Production - Production Machinery and Aminal Pc 1. Land perputation 2. Draft flot sowing 3. Threshing to tracted Sub-Refel	Unit (kg) (kg) (kun) (torne) (kg) (kg) (kg) (kg) (kg) (dil) (kg) (dil) (dil) (dil)	13.8 0.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20 20 20 20 3,59	21,233 21,267 21,267 Annount (Re.) 27,600 250 27,839 206 250 1,228 783 242 7(6) 564 1,562 401 411 4225	11,206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84 35 250 75.00 70.00		25991 13,009 250able Amount (Rs.) 31,700 240 250 1,228 783 3,501 500 6,501	3.36 450 50 6.14 6.26 4.34 3.5 2.50 75.0 75.0	Quantity Cauliflower) 15,000 15,000 1,5 5,0 200 125 100 4	12.166 ctables Amount (Re.) 50.400 50.400 675 250 1.228 783 3.500 1.000 2.436 563	30.00 50 6.14 6.26 4.84 35 259 75.0 70,0	55.0 45.0 45.0 45.0 45.0 4.00 5.20 8.60 80 40	5,662 Mango) Amount (Re.) 410,000 410,000 2,250 24,560 20,032 7,744 28,000 10,000 91,236 750	Arr	NPV 10% (Ra.) 21.575	0,4
Net Return per Ha Items DROSS RETURN Production By Products (Braw) PRODUCTION COST Farm Inputs 1. Seeds 2. FYM/ Compost 3. Fertilizer - Urea (N. '46%) - NSP (N. '50%) 4. Agros-temicals - Insecticity - Pesticitie - Pesticitie Sub-neud Machinery and Animal Ps 1. Land preputation 2. Drift for sowing 3. Threshing in Itemies	Unit (kg) (kg) (kg) (tone) (kg) (kg) (kg) (kg) (kg) (kg) (da.)	9.25 8.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 2	21,267 21,267 21,267 (Re.) 27,600 250 27,859 206 250 1,228 783 242 766 566 3,382 561 411	11,206	16,237 Unit Price 3.17 400 50 6.14 6.36 4.84 35 250 73.01		5.991 13.009 sgetable Amount (Re.) 31,700 31,700 240 250 1,228 783 3,501 500 6,591	975.00 75.00 75.00 75.00 75.00	Quartity Cauliflower) 15,000 15,000 4.5 5.0 200 325	12.166 Arrount (Re.) 50,400 50,400 675 250 1,228 783 3,500 1,000 7,436	30.00 50 6.14 6.26 4.84 35 25/1	55.0 45.00 45.00 45.00 4,000 3,200 8,600 800	5,662 Mango) Amouni (Rs.) 410,000 410,000 2,250 24,560 20,032 7,744 28,600 10,660 91,236 750 1551 26,488	An	9158 (Re.) 21.575 4.158	0,4
Net Return per Ha Incident Street St	Unit (kg) (kg) (kun) (torne) (kg) (kg) (kg) (kg) (kg) (dil) (kg) (dil) (dil) (dil)	13.8 0.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20 20 20 20 3,59	21,233 21,267 21,267 Annount (Re.) 27,600 250 27,839 206 250 1,228 783 242 7(6) 564 1,562 401 411 4225	11,206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84 35 250 75.00 70.00		25991 13,009 250able Amount (Rs.) 31,700 240 250 1,228 783 3,501 500 6,501	3.36 450 50 6.14 6.26 4.34 3.5 2.50 75.0 75.0	Quantity Cauliflower) 15,000 15,000 1,5 5,0 200 125 100 4	12.166 ctables Amount (Re.) 50.400 50.400 675 250 1.228 783 3.500 1.000 2.436 563	30.00 50 6.14 6.26 4.84 35 259 75.0 70,0	55.0 45.0 45.0 45.0 45.0 4.00 5.20 8.60 80 40	5,662 Mango) Amount (Re.) 410,000 410,000 2,250 24,560 20,032 7,744 28,000 10,000 91,236 750	Are	NPV 10% (Ra.) 21.575	0,4
Net Return per Ha hens DROSS RETURN Production By Production By Production Sy Product (Straw) PRODUCTION COST Farm Inputs 1. Seeds 2. Fy Mr Compost 3. Fertilizer - Urea (N. 46%) - TSP (P. 46%) - SOP (R. 26%) 4. Agro-clemicals - Insecticide - Pesticide - Shinetal Machinery and Animal Py 1. Land preparation 2. Drift for sowing 3. Threshing by teachs Self-Actal	Unit (kg) (kg) (kun) (torne) (kg) (kg) (kg) (kg) (kg) (dil) (kg) (dil) (dil) (dil)	13.8 0.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20 20 20 20 3,59	21,233 21,267 21,267 Annount (Re.) 27,600 250 27,839 206 250 1,228 783 242 7(6) 564 1,562 401 411 4225	11,206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84 35 250 75.00 70.00		25991 13,009 250able Amount (Rs.) 31,700 240 250 1,228 783 3,501 500 6,501	3.36 450 50 6.14 6.26 4.34 3.5 2.50 75.0 75.0	Quantity Cauliflower) 15,000 15,000 1,5 5,0 200 125 100 4	12.166 ctables Amount (Re.) 50.400 50.400 675 250 1.228 783 3.500 1.000 2.436 563	30.00 50 6.14 6.26 4.84 35 259 75.0 70,0	55.0 45.0 45.0 45.0 45.0 4.00 5.20 8.60 80 40	5,662 Mango) Amouni (Rs.) 410,000 410,000 2,250 24,560 20,032 7,744 28,600 10,660 91,236 750 1551 26,488	Are	9158 (Re.) 21.575 4.158	0,4
Net Return per Ha Incident Street St	Unit (kg) (kg) (kun) (torne) (kg) (kg) (kg) (kg) (kg) (dil) (kg) (dil) (dil) (dil)	13.8 0.25 50 6.14 6.26 4.84 35 250 75.0 75.0	2,000 1,000 (x 0.5) 25,0 5,0 200 125 50 20 20 20 20 20 20 3,59	12.333 21.267 21.267 ADDSynt (Re.) 27.600 250 21.859 206 250 1.228 783 242 766 3.562 3.61 413 225 2420	11,206	16,237 Unit Price 3.17 400 50 6.14 6.26 4.84 35 250 75.00 70.00		25991 13,009 Secuble Amount (Re.) 31,700 21,700 240 250 1,228 783 3,501 560 6,591 563 3,009	3.36 450 50 6.14 6.26 4.34 3.5 2.50 75.0 75.0	Quantity Cauliflower) 15,000 15,000 1,5 5,0 200 125 100 4	12.166 ctables Amount (Re.) 50,400 50,400 675 250 1,228 783 3,500 1,000 7,436 563 563	30.00 50 6.14 6.26 4.84 35 259 75.0 70,0	55.0 45.0 45.0 45.0 45.0 4.00 5.20 8.60 80 40	5,662 Mango) Amount (Rs.) 410,000 410,000 1,650 2,250 24,560 20,032 7,744 28,600 10,660 91,236 750 1551 26,488	Are	90 10% (Re.) 21.575 4.158 33 11622	5.3 8.4 Select

Table I.2.2.12 Incremental Economic Net Crop Production Value

The field factor of the second of the second

	_		Without Proj			With Project		Incren	nental
	_	Cropping	Net Produc		Cropping	Net Produc		Cropping	N.P.
	CCA	Arca	Per ha	Total	Arca	Per ha	Total	Area	Value
Items	115,600 ha	(ha)	(Rs./ha)	(Rs.'000)	(ha)	(Rs./ha)	(Rs. 000)	(ha)	(Rs.'000
Kharif Seas	nn Crons								
Sorghum	Оторо	2,440	2,260	5,520				-2,440	-5,520
Millet		2 200	2.000	7.265				2 200	2.26
Miller		2,390	3,080	7,365				-2,390	-7,365
Maize		20	660	13	23,100	9,991	230,792	23,080	230,779
Pluses		10	2,460	25	5,800	13,040	75,632	5,790	75,607
Cotton		60	15,030	902	11,500	20,181	232,082	11,440	231,180
Fodder		10	640	6	11,500	5,662	65,113	11,490	65,107
Guara		210	4,270	896		•		-210	-896
Vegetable	s (Eggplant)	30	3,240	97	3,000	21,050	63,150	2,970	63,053
1	Sub-total	5.170		14.824	54.900		666,769	49.730	651.944
Rabi Season	Cross								
Wheat	Crops	8,500	5,380	45,694	52,000	19,967	1,038,284	43,500	992,59
Pulses (Gr	ram)	4,280	4,300	18,422	11,500	13,638	156,837	7,220	138,41
Oilsceds (Rape/Mustard)	2,400	2,970	7,121	. 11,500	13,009	149,604	9,100	142,48
Sugarcane		30	8,720	262	11,500	16,237	186,726	11,470	186,46
Fodder (B	erseem)	60	960	58	11,500	8,428	96,922	11,440	96,86
Fruit (Mar	ngo)	15	3,670	55	3,000	15,947	47,841	2,985	47,78
Vegetable	s	15	6,910	104	3,000	38,075	114,225	2,985	114,12
	Sub-total	15.300		<u>71.715</u>	104.000		1.790.438	88.700	1.718.72
Spring Seas	on Crops						•		
Maize	•	•			5,800	11,181	64,850	5,800	64,85
Oilseeds					5,800	12,166	70,563	5,800	70,56
	Sub-total				11.600		135.413	11.600	135.41
Kharif Sea	ason Crops	5,170		14,824	54,900		666,769	49,730	651,94
Rabi Scas	on Crops	15,300		71,715	104,000		1,790,438	88,700	1,718,72
Spring Sea	ason Crops				11,600		135,413	11,600	135,41
	Total	20.470		<u>86.540</u>	170.500		2,592,619	150.030	2.506.08
								(Rs./ha)	21,67

Table I.2.3.1 Estimation of Road Development Benefit

1. Assumption (Based on the Survey in Paharpur Area)

(1) Average distance from farmgate/field to local markets

(2) Transportation Cost

By truck

Rs.

2 /ton/km

Rs. By animal

25 /ton/km

(3) Distance and Mode of Transportation from farmgate/field to local market

With road development

2 km by animal and 4 km by truck

Without road development

6 km by animal

(4) Distance and Mode of Transportation from farmgate/field to local market

With road development

58 /ton/6km

 $(=Rs.25 \times 2 \text{ km} + Rs.2 \times 4 \text{ km})$

Without road development

150 /ton/6km

 $(=Rs.25 \times 6 \text{ km})$

Difference (saving cost)

92 /ton/6km

2. Estimation of Commodity Traffic Quantity

Crops	Production	F	arm Inputs	•	
	(ton)	Рет ha(kg) ·	Area (ha)	Total (ton)	:
Kharif Season Crops		*************************			
Maize	80,850	372	23,100	8,593	* * .
Pulses	11,600	336	5,800	1,949	
Cotton	23,000	427	11,500	4,911	
Fodder	517,500	170	11,500	1,955	
Vegetables	30,000	432	3,000	1,296	
Rabi Season Crops					
Wheat/Barley	208,000	617	52,000	32,084	
Pulses	28,750	321	11,500	3,692	
Oilseeds	28,750	294	11,500	3,381	
Fodder	632,500	261	11,500	3,002	
Sugarcane	632,500	6,627	11,500	76,211	P
Fruits	30,000	401	3,000	1,203	
Vegetable	45,000	435	3,000	1,305	
0					:
Spring Season Crops Maize	20,300	372	5,800	2,158	
			the state of the s		
Oilseeds	14,500	298	5,800	1,728	
Total (Input & Output)	2,303,250		14	143,468 ((A)
Consumer goods (10% of A	()			14,347	
Total Quantity (ton)				2,461,065	
3. Road Development Benefit ur	der With Proje	ect Condition			
•	·			(Rs.'000)	
Commodity traffic (B)				226,418	
Passenger traffic(10% of B)			22,642	
Total Benefit					
Financial			•	249,060	
Economic				224,154	

Table I.2.3.2 Estimation of Benefit from Transfer of Rod Kohi Water Right

	Rod Kohi	Economic Net Produc	ction Value
Items	Sown Area	Per ha	Total
	(ha)	(Rs./ha)	(Rs.'000)
A. Kharif Season Crops			
Sorghum	1,310	2,277	2,983
Millet	1,010	2,940	2,969
Cotton	20	13,133	263
Guara	70	4,417	309
Vegetables	20	3,103	62
B. Rabi Season Crops			
Wheat/Barley	4,900	4,977	24,387
Wheat/Barley Pulses	4,900 1,970	4,977 4,324	24,387 8,518
•			
Pulses	1,970	4,324	8,518
Pulses Oilseeds	1,970 1,380	4,324 2,973	8,518 4,103

Table I.2.3.3 Estimation of Domestic Water Supply Benefit (1/2)

Tehsit	Total_		Year			Water	Population	covered	Condition .	
Union Council Mouza	Area (km2)	Popu- lation	No. of House- hold		Popu- lation Density	Supply Facility	Data from-	Ajusted Popu-		Beneficiar estimate
			·	(/H.hold)	(Km2)		P.H.E.D	lation		
. D.L. Khan								(A)		(A)x0.
aniala					•				* 1	٠
Paniala Janobi	127.3	7,022	937	7.5	55	I.G	10,839	7,022	Very Bad	
land Korai										
Band Korai	35.3	7,211	1,185	6.1	204	D.T	7,010	7,211	•	5,04
Kahliq-Shah	18.9	4,350	665	6.5	230					
'arik	1267	5 474	052	÷ -	40					
Budh Rodikhel	136.7 31.9	5,476 1,914	953 316	5.7 6.0	40 60					
Saddra	23.0	1,020	147	6.9	44					•
Talgi Rodi Khel	7.3	1,020	147	0.9	0					e e
Yarik	47,2	5,035	876	5.7	107	D.T	19,473	5,035	Normal	3,52
Leach	-11. -	3,033	0,0	5.7	101	D.1	כודקלו	5,055	14011188	.,,54
Hissam	30.5	2,840	453	6.3	93					
Keach	47.5	4,345	737	5.9	92	S.T	4,294	4,345	Normal	3,04
Mugim Shah	19.5	2,155	328	6.6	111		.,			-,-
Rahman	36.9	1,218	- 190	6.4	33	D.T	7,794	1,218		85
Chakhan	_									
Chakhan	45.6	2,175	380	5.7	48	Ç.T	4,468	2,175	Normal	1,52
Durabari	15.7	522	95	-5.5						
Garah Jamal	16.6	249	41	6.0					: 1	
Gumal	36.6	2,292	331	6.9						
Hayat Korai	13.0	1,430	242	5.9						
Jowia Shai	9.9	386	54	7.2						
Kalera Chania	4.6	0	0							
Kot Isa Khan	13.3	1,088	189	5.8						
Moor	6.4	187	31	6.0		n. m	1 400	1 400		1 16
Pota Rakh Chena	22.9 2.2	2,563 0	480 0	5.3 0		D.T	1,689	1,689	•	1,18
Sikandar Shumali	34.6	315	55			D.T	5,583	315		. 22
Surab Hasar	5,1	37	8			D.1	2,263	313	-	2.
Yara Manjhi Khel	16.8	543	85	6.4						
Zindani	10.0		•	0.7						
Akhmed	4.4	522	76	6.9	119					
Bhabh	5.3	0	0							
Bhoon	1.7	92	14	-						
Bigwani Janubi	17.8	1.481	224	6.6						
Chaddar	5.6	0	0							
Dad Mehar Baig	0.8	72	14	5.2	90					
Dad Wala Shomali	0.9	350	56	6.2	389					
Dar Wesha	10.3	422	72	5.9	41					
Dikhana	4.9	164	25	6.6	34					
Fagira	4.5	140	25	5.6	31					
Fatch	36.2	2,442	391	6.2	68	D.T	5,884	2,442	! -	1,70
Gahroka	1.0	82	12	6.6	83					
Ghafoora	1.0	77	10							
Haindan	18.8	518				D.T	5,583	518		36
Hasni	8.8	196								
Hatoo	2.0	313								
Hawasi	1.0	116								
Jandi	2.7	611	112							
Khodka	3.2	529								
Khuthi	37.2	1,406								
Loke	13,9	456								
Mapal Janubi	1.9	63								
Mapat Shumali	2.7	112								
Naurang Dau Naurang Otea	1.7 7.2	113								
Nautang Otra Nawab Patafi	1.7	352								
Ruk Nau		() 952								
	8.7 9.2	952 302								
Sewang Sheru Kolma	7.2	302								
Shero Nau	7.2 8.1	1,479								
Solma Shah	8.1 0.7									
Taj	4.4	50 458								
Tali	1.0	458 262								
Zindani	27.4					13.70	7 3411	1 214	2 May . 11. 1	
	27.4	1,218	238	5.1	45	D.T	7,249	1,211	Very Bad	

Estimation of Domestic Water Supply Benefit (2/2) **Table I.2.3.3**

Tehsil,	Total		Year	1993		Water	Population	covered (Condition	Actuall
Union Council Mouza	Area (km2)	Popu- lation	No. of House-	Average Family	Popu- lation	Supply Facility	Data	Ajusted		Beneficiar estimate
			hold	Size (/H.hold)	Density (Km2)		from P.H.E.D	Popu- lation		
Lunda Sharif	.		-	(m.nosu)	(KIIIZ)		r.n.c.u	ration		
Adha Khiara	9.6	278	45	6.1	29					
Adil Sipra	25.2	1,642	272	6.0	65	D.T	5,509	1,642		1,14
Bali Janobi	1.7	0	0	0	0		.,	-10		
Balu Gama Nihal	6.3	809	121	6.7	129	DT	3,183	809		56
Bobi	1.4	721	124	5.8	515					
Chhigiri	5.5	343	52	6.5	62					
Ghulam Daider	2.8	117	21	5.6	42					
Hayat Bochra	9.4	870	114	7.6	93					
Hayat Jorb	2.2	117	22	5.3	53					
Jumma Sharif	3.6	280	40	7.0	78	D.T	3,183	280	Normal	19
Mahmood Bhatti	1.4	119	25	4.8	85					
Mithy	8	265	47	5.7	33					
Rora	11.1	1,301	187	6.9	117					
Shahmear	7.6	369	69	5.3	49					
Umar Boba	0.8	115	19	6.1	143					
Zaman Talokara	6.2	98	19	5.1	16					
Naivala										
Malakhi	23.9	1,416	211	6.7	59					
Rashid	50.6	2,610	380	6.9	52	D.T	4,554	2,610	-	1,83
Mahra										
Маһла	64.2	4,353	671	6.5	68	S.T	14,974	4,353		3,04
Sikandar Janubi	42.5	1,789	333	5.4	42					
Miran										
Bhutaisar	33.3	1,696	276	6.1	51					
Chîrri-Bhor	65.2	1,218	238	5.1	19	D,T	2,576	1,218	-	. 85
Ghamsan	31.1	2,843	495	5.7	91					
Miran	46.1	1,872	289	6.5	41		_			
Ramak	119.8	6,803	1,105	6.2	57	S.T	16,700	6,803	-	4,70
Ghara Isa Khan										
Dhulka Kehna	4.3	79	11	7.2	18		•			
Gandi Umar Khan	82.5	3,915	475	8.2	48					
Khayara Fatch Mohd	3.9	302	47	6.4	77					
Sigo Mian Kheil	28.8	485	70	6.9	17	D.T	5,180	485	Very Bad	
Gira Mir Alam Khan	27.8	1,561	246	6.3	56					
Dhul Ka Jadid	5.3	875	145	6.0						
Gira Murid Shah	12.3	209	40	5.2						
Khayara Basharat	4.1	35	7	5.0						
Khawar	24.1	1,396	195	7.2	58					
Musa Zia Sharif										
Gandi Ashiq	33.7	1,860	260	7.2						
Gandi Isab	4.6	513	94	5.4	112					
Chowdwan	~ .	202	140		20					
Kori Hoot	26.4	787	160	4.9	30					
Mugha	13.6	240	45	5.3	18					
Tilli Budha Shah	25.9	855	132	6.5	33					
Maroo	12.8	451	67	6.7	35	D. 75	4 554	070		,
Jandi Babar	53.7	979	123	8.0		D.T	4,554	979	•	6
Kori Jamal	21.2	656	100	6.6	31					
D.1.Khan Tehsil	2,033.7	117,577	18,849	6.2	58	· · · · · · ·	140,279	52,367		30,5
Total										
2. Kulachi										
Muddi									•	
Muddi	43.9	3,932	541	7.3	90	D.T	4,208	3,932	Bad	
Sigu Ganda Pur	4.3	1,167	167			17.1	7,200	5,752	Dia	
Kulachi Tehsil	48.2	5,099	708	7.2	106		4,208	3,932		-
Total				· ·						
Administrative Area overing Study Area	2,081.9	122,676	19,557				144,487	56,299		30,5
	Population Non-benefi	ciary popu	lation			well)				1,3 92,1
	Number of	D.T requir	ed for no	n-beneficia	ries					
	Required de	evelomien	1 cost for	66 D.T (Re	s. 600.000/	lunit)			(Rs. 000)	39,6
	Annual ope								(Rs. 000)	2,6
					, •)					-,0
	Warer char-	ees/benefir	from 66	D.T (Rs 36	i()/years/bo	uset			(Rs:000)	5.2
Domestic Water Supply	Warer char	ges/benefit	from 66	D.T (Rs.36	iO/years/hq	use)			(Rs.'000)	5,2

I.F ; Infiltration gallery C.T ; Community tank

D.T.; Deep tube well (less than 91.4 m) = S.T.; Shallow tube well (Above 91.4 m) P.H.E.D.; Public Health Engineering Department = ; No information = 1 = 23

Table I.2.3.4 Estimation of Benefit from Reduction of Seasonal Migration

	Zin	dani(36))	Gadi Ü	mer Kha	n(30)	Ch	akhan(25	<u>;)</u>	j	Rahman(27)	
Sample	Month	Livi	Farm	Month	Livi	Farm	Month	Livi	Farm	Month	Livi	Farm
No.		Exp	Exp		Exp	Exp		Exp	Exp		Exp:	Exp
1 .	May	417	417	Mar-Apr	1,500	333	May	83	208	Mar	2,000	100
2				Mar-Apr	1,000	1,000	May.	2,000	5,000	Mar-Apr	3,000	2,000
3				Ari-May	833	167	May	250	500	Mar-Apr	3,000	2,000
4				Mar-Ma	500	4,167	May	250	833	Mar-Apr	3.000	2,000
5				Mar	1,000	500				Mar	3,000	1,500
6				Mar	500	167				May	2,000	3.000
7				Mar-Apr	833	667				Маг	2,000	3,000
8				Mar	42	167						
9				Mar-Apr	1,000	1,000	•					
10				Mar-Apr	500	1,000						
11				Mar-Apr	1,667	667						
12				Mar-Apt	4,167	1,667	* -				-	
13				Маг-Арт	3,333	2,000						
Total		417	417		16,875	13,502		2,583	6,541		18,000	13,600

	Panial	a Janobii	(30)	E	Budh(30)		<u> </u>	(arik(30)		N	Iuddi(25)	
Sample No.	Month	Livi Exp	Farm Exp	Month	Livi Exp	Farm Exp	Month	Livi Exp	Farm Exp	Month	Livi Exp	Farm Exp
1	Mar-Apr	2,000	5,000	Nov-Dec	1,000	1,600	June	1,000	1,000			
2	May	100	800	Mar-Apr	1.000	1,600	June	1,000	1,000			
3				Mar-Apr	1,200	2,000	May	3,000	1,000	None	* *	
4				Mar-Apr	2,000	2,000	•					
5				Apr	4,000	3,000						
6				Mar-Apr	1,500	2,500						
7				May	1,000	3,000						
8				Apr	1,000	3,000						
9				Apr	2,000	4,000						
10				May-Jur	2,000	7,000						
11				Mar-Apı	1,000	3,000						
Total		2,100	5.800		17,700	32,700		5,000	3,000			

	Jumm	a Sharif	(20)	C	hhigiri(20))		Total (27	(3)	Benefit from	
Sample	Month	Livi	Farm	Month	Livi	Farm	Month	Livi	Farm	Reduction of seasons	ıl
No.		Exp	Exp		Exp	Exp		Exp	Exp	migration	
1	Mar-Apı	1.500	2,500	March	800	700		10,300	11,858	- 7 .	
2	Mar-Apı	1,000	1,000	March	400	250		9,500	12,650		747
3	Mar-Apr	4(X)	800					8,683	6,467	Total household num	ber
14	Apr	1.000	0					6.750	9,000		19,557
5	Mar-Apı	2.000	0					10,000	5,000	Percentage of migrat	
6	Mar-Apr	1,500	()					5,500	5,667	households	18.3%
7	Apr-June	1,500	0					5,333	6,667		
8								1,042	3,167	Financial migration of	ost
y							1	3.000	5,(XX)		(Rs./year)
10							•	2,500	8,000	Living expense	5,213,409
11								2,667	3,667	- Farm expense	5,789,015
12							-	4,167	1,667		11.002,424
13		-						3,333	2,(XX)		
								,.		Economic migration	cost
Total		8,900	4,300		1,200	950		72,775	80,810		(Rs./year)
										- Living expense	4,692,068
					Total mig	rant	(50)			- Farm expense	5,210,114
					Total sam		(273)			Total	9,902,182

Table I.2.4.1 Weighted Conversion Factor of Cost Component

Project Cost Component	Local		aucial Cos F	oreign	Total	Local		ic Cost F	oreign A	ighte verag
Project Cost Controllent	Transfer n-sl		Others	Cost	TOTAL	Transfer n-s		Others	Cost	
. Capital Cost										
1. Direct Construction Cost										
a) Land Acquisition and Others	42.0	1.1	43.3	13.6	100.0	0.0	1.0	39.0	13.6	53
Land Acquisition	100.0	0.0	0.0	0.0	100.0 100.0	0.0	0.0	0.0 81.0	0.0 0.0	0 81
Construction (House) Construction Camp	10.0 6.0	0.0 3.3	90.0 50.8	0.0 39.9	100.0	0.0	2.9	45.7	39.9	88
Constitution Camp	. 0.0	3.3	50.0	37.7	100.0			1517	J. 1.	
b) Feeder Canal	4.0	4.5	26.8	64.7	100.0	0.0	4.0	24.1	64.7	9
Earthwork	2.0	2.6	16.1	79.3	100.0	0.0	2.3	14.5	79.3	9
Structure	6.0	7.3	43.6	43.1	100.0	: 0.0	6.4	39.2	43.1	8
c) Pump Station	. 2.0	4.5	18.4	75.1	100.0	0.0	4.0	16.6	75.1	9
Pump Equipment	2.0	4.7	8.5	84.8	100.0	0.0	4.1	7.7	84.8	9
Other Works	5.0	4.2	35.8	55.0	100.0	0.0	3.7	32.2	55.0	9
d) Main Canal	5.0	5.2	38.9	50.9	100.0	0.0	4.6	35.0	50.9	9
Earthwork	3.0	3.9	25.7	67.4	100.0	0.0	3.4	23.1	67.4	9
Structure	6.0	5.8	44.9	43.3	100.0	0.0	5.1	40.4	43.3	8
e) Distributory Canals	5.0	10.1	34.3	50.6	100.0	0.0	8.9	30.9	50.6	9
· Earthwork	4.0	13.6	22.2	60.2	100.0	0.0	12.0		60.2	9
Structure	6.0	5.8	49.5	38.7	100.0	0.0	5.1	44.6	38.7	8
f) Regulation Pond	4.0	5.7	34.8	55.5	100.0	0.0	5.0	31.3	55.5	9
h) River Treatment & Drainage Canals	2.0	1.2	14.8	82.0	100.0	0.0	1.1	13.3	82.0	ç
i) Farm Roads	4.0	2.8	32.2	61.0	100.0	0.0	2.5	29.0	61.0	Ģ
j) On-farm Development Cost	5.0	0.5	40.2	54.3	100.0	0.0	0.4	36.2	54.3	ç
k) Sump Well & Domestic Water Supply	5.0	10.2	30.7	54.1	100.0	0.0	9.0	27.6	54.1	ç
I) Other and Miscellaneous Works	6.0	3.3	50.7	40.0	100.0	0.0	2.9	45.6	40.0	8
Sub-total	. 4.7	4.3	29.2	61.8	100.0	0.0	3.8	26.3	61.8	ġ
2. Indirect Construction Cost										
a) Consultancy Service Cost	4.0	0.0	34.2	61.8	100.0	0.0	0.0		61.8	•
b) Implementation Cost	4.0	4.3		61.8	100.0	0.0	3.8		61.8	9
<u>Suh-total</u>	4.0	1.6	32.6	61.8	100.0	0.0	1.4		61.8	•
3. Physical Contingency	4.0	4.3	29,9	61.8	100.0	0.0	3.8	26.9	61.8	4
Total Base Construction Cost	4.5	4.0	29.7	61.8	100.0	0.0	3.5	26.7	61.8	,
O & M Cost	0.8	16.9	59.1	16.0	100.0	0.0	14.9		16.0	
1. Public	8.0	5.4	68.5	18.1	100.0		4.8		18.1	
2.Association	9.0	45.7		10.7	100.0		40.		10.7	
, Replacement Cost	2.0	4.8		79.5	100.0		4.1		79.5	
1. Public	2.0	4.		79.9	0.001		4.3		79.9	,
2.Association	4.0	4	28.9	62.6	100.0	0.0	4.	26.0	62.6	

Table I.2.4.2 Economic Cost Estimate and Annual Disbursement

Designations Commonant	1970	Connection	1	12	2nd	24/	Ark	3rd 4th Sth	Ath	417	Total
riojeci Cost Controlleni	(Rs. 000)	Factor	(Rs. 1000)	164	7 YEAR		ř	100	100	ā,	TOTAL
1. Direct Cost				٠							
a) Land Acquisition	262,012.0	53.6	140,438.4	30,116.4	22,064.4	22,064.4	22,064.4	22,064.4	22,064.4	0.0	140,438.4
b) Feeder Canal	2,287,758.4	92.8	2,123,039.8	0.0	353,840.0	707,679.9	9.679,07	353,840.0	0.0	0.0	2,123,039.8
c) Pump Station	1,588,618.0	95.7	1,520,307.4	0.0	92,007.5	184,015.0	368,030.0	396,069.0	480,185.9	0.0	1,520,307.4
d) Main Canal	2,129,298.8	90.5	1,927,015.4	0.0	0.0	0.0	335,300.7	698,221.9	530,571.6	362,921.2	1,927,015.4
e) Distributory Canals	816.016.8	4.06	737,679.2	0.0	0.0	0.0	69,341.8	257,450.0	222,779.1	188,108.3	737,679.2
f) Regulation Pond	595,483.5	8.16	546,653.9	0:0	0.0	0.0	51,385.5	190,782.2	165,089.5	139,396.7	546,653.9
h)Drainage Canals	1,521,116.2	96.4	1,466,356.0	0.0	0.0	0.0	0.0	454,081.6	563,569.5	448,704.9	1,466,356.0
i) Farm Roads	18,060.1	92.5	16,705.6	0.0	0.0	0.0	981.5	4,518.9	6,093.4	5,111.8	16.705.6
j) On-farm	639,117.6	6'06	580,957.9	0.0	0.0	0.0	34,131.3	157,149.1	211,904.4	177,773.1	580,957.9
Development k) Sump Well	20,160.2	90.7	18,285.3	0.0	0.0	0.0	1,718.8	6,381.6	5,522.2	4,662.7	18,285.3
l) Miscellaneous	242,760.0	88.5	214,842.6	30,691.8	30,691.8	30,691.8	30,691.8	30,691.8	30,691.8	30,691.8	214,842.6
Sub-total	10.120.401.6	91.8	9 292 281 5	60.808.2	498.603.7	944.451.1	1.621.325.7	2.571.250.5	2,238,471.8	1357,370,5	9.292.281.5
II. Indirect Cost											
a) Consultancy	1,012,040.2	92.6	937,149.2	197,294.6	123,309.1	147,970.9	246,618.2	98,647.3	73,985.5	49,323.6	937,149.2
b) Implementation	607,224.1	92.5	561,682.3	245,551.0	52,688.5	52,688.5	52,688.5	52,688.5	52,688.5	52,688.8	561.682.3
Sub-total	1,619,264.3	92.6	1.498.831.5	442.845.6	175.997.6	200,659.4	299.306.7	151 335.8	126.674.0	102,012.4	1.498.831.5
III. Physical Contingency	1,012,040.2	92.5	936.137.2	8,405.2	51,178.4	95,341.1	163,418.0	258,165.1	223,901.5	135,727.9	936,137.2
Base Cost	12,751,706.0		11,727,250.2	512,059.0	7.25,779.7	1,240,451.6	2,084,050.4	2,980,751.4	2,589,047.3	1,595,110.8	11,727,250.2
					3	ļ	\$	ŝ		1	
			<u>.l.</u> .	ਲ]	ZINI	3rd	2 4	OC .	Offi	g)/	Sth
IV. O & M Cost (Full Year)	317,080.0	25	266,664.3	0.0	0.0	0.0	0.0	27,929.6	41,806.1	123,460.5	266.664.3
V. Replacement Cost				28st	29nd	30th	3181	32nd	33th	34th	Total
a) PumpEquipment	1,080,000.0	6.59	1,042,200.0	0.0	312,660.0	312,660.0	416,880.0	0.0	0.0	0.0	1.042,200.0
b) Gate	105,500.0	86.6	91,363.0	12,297.2	12,297.2	36,978.2	14,895.2	14,895.2	0.0	0.0	91.363.0
c) Others	4.655.0	96.1	4,473.5	602.1	602.1	1.810.6	729.3	729.4	0.0	0	4 472 5

Table I.2.5.1 **Economic Cost and Benefit Stream for Economic Evaluation**

		Hensel'lt			Belli-op_	Production			Cost		
1	NCPV=	red (11	reduction Do	Crop I) Italia	Arm	Total	Replace	ORM	Const-	o. of Year
)	Area(D)	Arm(C)	Ares(B)	Aren(A)		Developed (Na)		mert		rection	
,	0	0		0		. 0	512,059	. 0	0	512.039	1
)	0	0	0	. 0		0	725,780	ò	ò	725,700	2
)	0		0	0		8	1,240,452	ō	ō	1,346,452	3
)	٥	ŋ	0	0		Ò	2,054,050	ō	0	2.004.050	Ā
19	0	0	0	196,629	0.50	18,140 (A)	3,000,681	ō	27,930	2,990,751	3
) 35	0	0	90,314	235,617	0.65	9,070 (8)	2,630,853	ò	41,206	2,509,047	š
) #	0	574,494	127,809	294,943	0.73	53,000 (C)	1,710,572	ō	123,461	1,595,111	,
1.61	383,610	746,942	147,471	334,269	0.85	35,390 (D)	266,664	. 0	206,664	0	í
	476,693	961,740	167,134	353,951	0.90	6	266,664	Ō	266.664	ō	÷
	375,415	976,639	176,966	373,594	0.95	ŏ	304.664	Ď	256.664	0	10
	652,137	1,034,088	186,797	393,257	1.00	ŏ	366,664	ő	266,664	ő	11
	490,494	1,091,338	196,629	393,257	*,40	ŏ	266,664	ŏ	255,564	ŏ	12
	728,659	1,148,987	196,629	393,257		ŏ	266,664	ŏ	266.664	ŏ	13
	767,230	1.145,987	196,629	393,257		0	266.664	0	266,664	0	
	767,220	1,141,987	196,629	373,257		ő	266,664	0	266,664		14
	767,220	1.148.987	196,629	393,257		ů	266,664	0		0	15
	767,220	1,148,987	196,629	393,257		0	266.664	0	266,664	0	16
	767,220	1,148,967	196,629	393,237				_	206,664	0	17
						0	266,664	0	366,664	0	18
	767,220	1,148,987	196,629	393,257		0	366,664	0	366,664	۰	19
	767,220	1,149,907	196,629	393.257		0	266,664	0	266,664	0	30
	767,220	1,149,987	196,629	393,257		0	266,664	0	366,664	0	21
	767,220	1,144,987	196,629	393,257		0	256,664	0	266,664	0	22
	767,230	1,146,987	196,629	393,237		0	266,664	0	366,664	,0	23
	767,220	1,148,987	195,629	393,257		0	366,664	0	356,664	0	24
	767,220	1,148,987	196,629	393,257		0	266,664	0	266,664	0	- 25
	767,220	1,148,967	196,629	393,257		0	266,664	0	256,664	0	26
	767,220	1,148,967	196,629	393.257		0	256,664	0	356,664	0	27
	767,220	1,148,987	196,629	393,257		0	279,563	12.899	266,664	. 0	. 28
0 2.5	767,220	1,148,987	196,629	393,257		0	592,223	325,559	266.664	0	29
	767,220	1,148,987	196,629	393,257		0	618,113	351,449	266,664	0	30
10 2 <u>.</u> 50	767,220	1,148,987	196,629	393,217		0	699,169	432,505	266,664	0	31
0 2,5	767,220	1,148,967	195,629	393,257		0	287,289	15,625	266,664	0	32
0 2,50	767,220	1,148,987	196,529	393,257		0	266,664	٥	266,664	Ď	33
10 2,50	767,230	1.148,987	196.629	393,257		0	266,664	0	266,664	0	34
0 2,5	767,220	1,148,987	196,629	393,257		0	266,664	0	266,664	0	35
0 25	767,220	1,146,967	196,629	393,237		Ó	256,664	ò	266,664	ō	36
0 2,5	767,220	1,142,987	96,629	393,237		0	266,664	ō	266,664	ò	37
0 23	767,220	1,148,987	196,629	393,257		ò	266,664	ă	256,664	ŏ	39
0 25	767,220	1.148.997	196,629	393,257		ò	266,664	ō	266,664	ŏ	39
0 25	767,220	1.148,987	196,629	393,257		Ô	266,664	. 0	266,664	ő	40
0 2,5	767,220	1.148,987	196,629	393,257		ō	266,664	ŏ	266,664	· ŏ	41
	767,220	1,148,987	196,629	393,257		ŏ	266,664	ō	256,664	ō	42
0 2,5	767,220	1,148,987	196,629	393,257		ŏ	266,664	ŏ	266,664	ŏ	43
	767,220	1,148,967	196,629	393,257		ő	266,664	ŏ	266,664	0	44
	767,220	1,148,967	196,629	393,257		ŏ	266,664	ě	266,664	ő	45
	767,220	1,148,987	196,629	393,257		ő	256,654	ŏ	266,664	ő	46
	767,220	1,144,967	196,629	393,257		ŏ	366,664	ŏ	266,664	ŏ	47
	767,220	1,148,987	196,629	393,257		· ŏ	266,664	ŏ	255,564	ŏ	4
	767,220	1.148,987	196,629	393,257		ŏ	266,664	ŏ	266,664	ő	49
	767,220	1,148,987	196,629	393,257		ŏ	266,664	ŏ	266,664	0	90 90

Road	Water		B - 1 - 1				+ Load	+ W mice	+ Domestic		
		Dovremenic	Reduction	CHOROLD .	Total	Сгор				+ Reduction	^
Xerelop-	Right	Water	Semonal	(Traint		Product-	Derelop-	Right	Water	Seasonal	lte
ment	Transfer	Sweety	Migration			tion	(Text)	Transfer	Sapply	Migration	
0	0	0	0	0	0	-512,059	-512,059	-512,059	-512,059	-512,0 59	-5120
0	ė	0	9	0	0	-725,780	725,700	725,780	725,700	-725,780	-725,7
0	0	0	0	0	0	-1,240,452	-1,240,457	-1,240,452	-1.240,452	1,240,452	-1,240,4
Ģ	0	0	0	0	. 0	-2,064,050	-2,094,050	-2,054,050	-2,084,050	-2,004,050	-2,084,0
18_582	2,059	3,544	82 1	3,648	225,203	-2,812,052	-2,793,470	-2.791,411	-2,787,867	-2,717,046	-2,783,3 -2,221,2
32,149	3,705	6.132	1,420	6,311	403,648	-2,276,922	-2,244,773	-2,241.068	-2,234,936 -604,676	-2,233,516 -600,736	-583,2
19,197	10,440	17,013	3,940	17,509	1,135,345	-721,326 1,345,528	-632,129 1,489,728	621,689 1,506,606	1,534,110	1,540,480	1,568,7
144,200	16.070	27,504	6,370	28,306 33,034	1,835,450 2,142,050	1,614,834	1,783,122	1,802,820	1,134,911	1,842,352	,975.3
168.288	19.696 22.013	32.098 35.871	7,434 8,300	36,916	2,393,787	1,835,950	2.024.015	2.046,028	2,081,899	2.090,207	2,127,1
188,065 202,704	23,726	38,663	6,954	39,790	2,500,116	1,999,615	2,202,319	2,226,045	2,264,708	2,273,662	2,313,4
212.153	24,832	40,465	9,372	41,644	2.700,388	2,105,258	2,317,411	2,342,243	2,382,706	2,392,000	2,433,7
230,723	25,835	42,100	9,750	43,326	2,909,466	2,201,060	2,421,791	2,447,626	2,489,726	2,499,476	2,542,0
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,586,4
234.154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,596,4
224.154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2.542,476	2,586,4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2.542,476	2,586.4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,586,4
224,154	26,237	42,754	9,902	44,000	2.853.140	2,239,429	2,463,583	2,489,820	2.532.374	2,542,476	2,566,4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,516,4
224,154	36,237	42,754	9.902	44,000	2,853,140	2,239,429	2,463,563	2,489,830	2,532,574	2,542,476	2,546.4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2.532.574	2,542,476	2,586,4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583 2,463,583	2,489,820 2,489,820	2,532,574 2,532,574	2,542,476 2,542,476	2,586,4 2,586,4
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429 2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,586.4
274,154	26,237	42,754	9.902	44,000	2,853,140 2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,586,4
224,154 224,154	26,237	42,754 42,754	9,902 9,902	44,000 44,000	2,653,140	2,239,429	2,463,583	2,449,820	2,532,574	2,542,476	2,586,4
224.154	26,237 26,237	42,754	9,902	44,000	2,853,140	2,226,530	2,450,684	2,476,921	2,519,675	2,529,577	2,573,5
274,154	36,237	42,754	9,902	44,000	2,853,140	1,913,070	2,138,024	2,164,261	2,207,015	2,216,917	2,260,9
224,154	36,237	42,754	9,902	44,000	2,853,140	1,887,980	2,112,134	2,131,371	2,181,125	2,191.027	2,235.0
234,154	26,237	42,754	9,902	44,000	2,853,140	1,805,924	2,031,078	2,057,315	2,100,069	2,109,971	2,153,9
224.154	26,237	42,754	9,902	44,000	2,053,140	2,223,304	2,447,950	2,474,195	2,516,949	2,526,651	2,570,1
224,154	26,237	42,754	9,902	44,000	2,837,140	2,239,429	2,463,583	2,489,820	2,512,574	2,542,476	
234,154	35,207	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	
224,154	26,237	42.754	9,902	44,000	2.853.140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	
224,154	26,237	42,751	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,830		2,542,476	2,586,
274,154	26,237	42,734	9,902	44,000	2,853,140	2,239,429	2.463,583	2,489,820		2,542,476	
224,154	25,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,830		2,542,476	
224,154	26,237	42,754	9,902	44,009	2,853,140	2,239,429	2,463,583	2,489,820		2,542,476 2,542,476	
224,154	26,237	42.754	9,902	44,000	2,853,140	2,239,429 2,239,429	2,463,583 2,463,583	2,489,820		2,542,476	
224,154	36,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820		2,542,476	
224,154	25,237	42,754	9.902	44,000 44,000	2,853,140 2,853,140	2,239,429	2,463,583	2,489,620		2,542,476	
224,154 224,154	26,237 26,237	42.754 42.754	9.902 9.902	44,000 44,000	2,853,140	2,239,429	2,463,583	2,489,820		2,342,476	
224,154	26.237	12.754	9,902	44,000	2.853.140	2,239,429	2,463,583	2,489,820		2,542,476	
724,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489,820		2,542,476	
224,154	36,237	42,754	9,902	44,000	2.853,140	2,739,429	2,463,583	2,489,820		2,542,476	2,586,
234,154	26,237	42,754	9,902	44,900	2,853,140	2,239,429	2,463,563	2,489,820	2,532,574	2,542,476	2,586,
224,154	26,237	42,754	9,902	44,000	2,853,140	2,239,429	2,463,583	2,489.820	2,532,574	2,542,476	
224,154	36,237	42,754	9,902	44,000	7,853,140	2,239,429	2,463,583	2,489,820	2,532,574	2,542,476	2,586,
13.62%	14.69%	14.61%	15.01%		15.06%		15.26%				
1100)											
2,504,982	13,624,366	13,755,285	13,960,792		14,018,240		14,237,969				
9,066,355	9,066,355	9,066.335	9,066,355		9,066,355		9,066,355				
1.38	1.50	1.52	1.54		1.55		1.37				
13.62% 100) 2,504.982 9,066,355		14.69% 3.624.368 9,066,355	14.69% 14.81% 13.624.368 13,755,285 9,066,335 9,066,335	14.69% 14.81% 15.01% 13.634.368 13,755,285 13.968,792 9,066,355 9,066,355 9,066,355	14.69% 14.61% 15.01% 13.624.366 13.755,265 13.966,792 9.066,335 9.066,335 9.066,335	14.69% 14.81% 15.01% 15.06% 13.624.368 13.755,265 13.906,792 14.018,240 9,066,335 9,066,335 9,066,335 9,066,335	14.69% 14.81% 15.01% 15.06% 13.624.368 13.755,285 13.968,792 14.018,240 9.066,355 9.066,355 9.066,355 9.066,355	14.69% 14.41% 15.01% 15.06% 15.26% 13.624.364 13.735.265 13.904.792 14.018.240 14.237,999 9.066.335 9.066.335 9.066.335 9.066.355 9.066.355 1.50 1.52 1.54 1.55 1.37	14.69% 14.81% 15.05% 15.06% 15.26% 13.654.368 13.755.285 13.968.792 14.018.240 14.237.999 9.066.355 9.066.355 9.066.355 9.066.355 1.50 1.52 1.54 1.55 1.37	14.69% (4.41% 15.01% 15.06% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.27% 15.26% 15.26% 15.27% 15.26% 15	14.69% 14.81% 15.01% 15.06% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.26% 15.27 14.018.240 14.237,969 9.066,355 9.066,355 9.066,355 9.066,355 1.50 1.52 1.54 1.55 1.57

Table I.3.1.1 Assessment of Water Charge and Replacement Cost

	Crop Water	Cropping	Total Net	Requir	ed Water C	harges	Required	Replaceme	nt Charges	Requir	ed Total Ch	arges
Hem	Requirement	Area	Water Requirement	Pubic	Associ- ation	Total	Pubic	Associ- ation	Total	Pubic	Associ- ation	Tota
· · · · · · · · · · · · · · · · · · ·	(m3/ha/net)	(ha)	('000 m3)								<u></u>	<u>. </u>
Kharif Season Crops			4	•					**	17		
Maize	3,900	23,100	90,090	1,536	266	1,802	444	. 74	518	1,980	340	2.32
Pulses	2,050	5,800	11,890	807	140	947	233	39	272	1,040	179	1.21
Cotton	6,320	11,500	72,680	2,489	431	2,920	720	119	839	3,209	550	3.75
Fooder	3,210	11,500	36,915	1,264	219	1,483	366	60	426	1,630	279	1.90
Vegetables	6,680	3,000	20,040	2,631	456	3,087	761	126	887	3,392	582	3.97
Rabi Season Crops												
Wheat	2,970	52,000	154,440	1,170	202	1,372	338	56	394	1,508	258	1.76
Pulses(Gram)	3,370	11,500	38,755	1,327	230	1,557	384	64	448	1,711	294	2,00
Oilseeds(Rape/Mustare	3,120	11,500	35,880	1,229	213	1,442	355	59	414	1,584	272	1.85
Sugarcane	12,290	11,500	141,335	4,841	838	5,679	1,400	232	1,632	6,241	1,070	7.31
Fodder	2,240	11,500	25,760	882	153	1,035	255	42	297	1,137	195	1,33
Fruit	2,860	3,000	8,580	1,127	195	1,322	326	54	380	1,453	249	1,70
Vegetables	2,860	3,000	8,580	1,127	195	1,322	326	54	380	1,453	249	1,70
Spring Season Crops										1		
Spring Muize	3,470	5,800	20,126	1,367	236	1,603	395	. 66	461	1,762	302	2,06
Oil seeds	3,650	5,800	21,170	1,438	249	1,687	416	69	485	1,854	318	2,17
Total		170,500	686,241	•					,			····
Total		170,300	000,241						· · · · · ·			
O&M Cost (Rs. 000)	317,080	O&M Cost	ет 1000 m3	462.1								
Public Expenses	270,330	Public Exper	nses	393.9								
Associations' Expenses	46,750	Associations		68.2								
				Total	Annual/25 ye	(10% of	interest)					·
Replacement Cost (Rs. '000)	210,250	Penjaremen	t Cost per 1000	306.4		132.8						
		-			:							
Public Expenses	180,300	Public Expe		262.7		113.9						
Associations' Expenses	29,950	Associations	Expenses	43.7		18.9						
(Excliding Pump)												

Table I.3.1.2 Farm Budget Analyses (1/3)

Type I (Maize-Fodder-Wheat-Maize-Wheat-Cotton)

Item (Operating s	ìze/			Small 2.31	Medium 4.70	Large 18.89	Total 12.94
_	npling survey, ha)						
* ***	D. J. C. P. D. J. D. J. D. D.	HOA 15	C				
	Project Condition (Based on Far	m JICA Far	m Survey	22,098	29,406	38,065	33,135
1. Inco				10,904	17,210	24,145	20,089
	a) Farm Income			11,194	12,196	13,920	13,046
	b) Non - Farm Income			11,177	12,170	13,720	15,610
2. Exp	enditure			21,571	28,158	35,254	31,066
F	a) Farm Expenditure			2,462	4,462	10,175	7,529
	b) Non - Farm Expenditure			19,109	23,696	25,079	23,537
3. Net	Surplus			527	1.248	2,811	2,069
	oject Condition					. :	
<u> </u>	<u>oper contrion</u>						
Type I:	Year	1st	1st	2nd	2nd	3rd	3rd
4	Cropping Pattern	Maize(S) F	odder(K)	Wheat	Maize(K)	Wheat	Cotton
	Intoncity	0.1	0.6	0.9	0.6	0.9	0.6
	Intensity Gross Return (Rs./ha)		9,000	16,200	15,120	16,200	19,850
	Production Cost (Rs./ha)	*	2,516	6,913	5,187	6,913	6,617
	Water Charge (Rs./ha)		1,441	1,333	1,751	1,333	2,837
	Replacement Charges (Rs./ha)		414	383	503	383	815
. 1. Inc	ome:			55,209	101,751	373,853	259,607
				44.045		250.022	246 561
	a) Farm Income			44,015	89,555	359,933	246,561
	(3 years Average)			11.104	10 106	12 020	13,046
	b) Non - Farm Income			11.194	12,196	13,920	13,040
	(Same as Without)						
2. Ex	penditure			39,528	62,203	165,814	121,214
	a) Farm Expenditure			16.597	33,768	135,719	92,970
	b) Non - Farm Expenditure			22,931	28,435	30,095	28,244
	(Without x 1.2)						
3. Ne	t Surplus	•		15,681	39,548	. 208,039	138,39
							
4.Red	juired Full O&M and Replacement Ch	arges		4 110	12,448	50.034	34 27
	a) Total			6.119 4.753		50,034 38,867	34,27. 26,62
	b) Water Charge c) Replacement Charge			1,366		11,167	7,64
	1) rehimeningin oum fo			<i>,</i>			
	d) Share to Net Surplus(%)						
+ * ₁	Total			39.0%		24.1%	24.89
	Water Charge			30.3%		18.7%	19.29
	Replacement Charge			8.7%	7.0%	5.4%	5.59

Note: Operating sizes of farm are the sampling result of JICA Farm Survey.

Table I.3.1.2 Farm Budget Analyses (2/3)

Type II (Wheat-Maize-Oilseed-Maize-Wheat-Maize)

Item (Operating s Result of sai	size/ mpling survey, ha)				Small 2.31	Medium 4.70	Large 18.89	
		F3	пол г	0				
1. Without	Project Condition (Based	on rarm	JICA F	ımı Surve		20.404	20 06	22.124
1. Inco	a) Farm Income				22,098	29,406	38,065	33,135
	b) Non - Farm Income				10,904 11,194	17,210 12,196	24,145 13,920	20,089 13,04
2. Exp	penditure				21,571	28,158	35,254	31,06
•	a) Farm Expenditure				2,462	4,462	10,175	7,52
	b) Non - Farm Expenditure				19,109	23,696	25,079	23,53
3. Net	t Surplus				527	1,248	2,811	2,06
II. With Pr	roject Condition							
Type II:	Year		1st	1st	2nd	2nd	3rđ	- 3r
	Cropping Pattern	***		Maize(K)	*****************			Maize(K
	Intensity		0.9	0.6	0.9	0.6	0.9	0.
	Gross Return	(Rs./ha)	16,200	15,120	19,000	15,120	16,200	15,12
	Production Cost	(Rs./ha)	6,913	5,187	5,034	5,187	6,913	5,18
•	Water Charge	(Rs./ha)	1,333	1,751	1,401	1,751	1,333	1,75
	Replacement Charges	(Rs./ha)	383	503	402	5 03	383	50
1. Inc	ome				67,771	127,308	476,574	329,97
	a) Farm Income				56,577	115,112	462,654	316,92
	(3 years Average)							
	b) Non - Farm Income (Same as Without)				11,194	12,196	13,920	13,04
2. Ex	penditure				43,190	69,655	195,764	141,73
	a) Farm Expenditure				20,259	41,220	165,669	113,48
	b) Non - Farm Expenditure				22,931	28,435	30,095	28,24
	(Without x 1.2)				22,751	20,433	30,023	20,21
3. Ne	t Surplus				24,581	57,653	280,810	188,24
4.Rec	quired Full O&M Charges							
	a) Total				6,752	13,737	55,214	37,82
	b) Water Charge				5,245		42,894	
	c) Replacement Charge				1,507		12,320	8,43
	d) Share to Net Surplus(%)							
	Total				27.5%		19.7%	20.19
	Water Charge				21.3%		15.3%	
	Replacement Charge				6.1%	5.3%	4.4%	4.59
						•		

Note: Operating sizes of farm are the sampling result of JICA Farm Survey.

Table I.3.1.2 Farm Budget Analyses (3/3)

Type III (Fodder-Sugarcane-Sugarcane--Maize)

Item (Operating size	zel				Small 2.31	Medium 4.70	Large 18.89	Total 12.94
-	pling survey, ha)							
,								
	roject Condition (Based	on Far	m JICA F	ırm Surve	-			
1. Incor					22,098	29,406	38.065	33,135
	a) Farm Income				10,904	17,210	24,145	20,089
i	b) Non - Farm Income				11,194	12,196	13,920	13,046
2. Expe	nditure				21,571	28,158	35,254	31,066
•	a) Farm Expenditure				2,462	4,462	10,175	7,529
	b) Non - Farm Expenditure				19,109	23,696	25,079	23,537
3. Net 5	Surplus				527	1,248	2,811	2,069
	eject Condition							
II. WILLIA	<u>ject condition</u>							
Type III:	Year		lst	1st	2nd	2nd	3rd	3rc
	Cropping Pattern		Fodder(R)	Sugarcane	Sugarcane	-	Maize(S)	
	Intensity		0.9	1.0	1.0	0.0	0.1	0.0
	Gross Return	(Rs./ha)	13,750	24,500	14,000	0.0	16,205	0.0
	Production Cost	(Rs./ha)		11,079	6,656	0.0	5,187	0.0
	Water Charge	(Rs./ha)	1,006	5,517	3,862	0.0	1,558	0.0
	Replacement Charges	(Rs./ha)		1,585	1,110	0.0	448	0.0
					(70% of Ch	narges)		
1. Inco	me				51,616	94,439	344,467	239,47
	a) Farm Income				40,422	82,243	330,547	226,43
	(3 years Average)							
	b) Non - Farm Income				11,194	12,196	13,920	13,04
	(Same as Without)							
2. Exp	enditure				40,021	63,207	169,848	123,97
F								
	a) Farm Expenditure				17,090		139,753	95,73
	b) Non - Farm Expenditure				22,931	28,435	30,095	28,24
	(Without x 1.2)							
3. Net	Surplus				11,595	31,232	174,619	115,49
4.Rea	uired Full O&M Charges							
	a) Total				10,349	21.056	84,627	57,97
•	b) Water Charge				8,039	16,356	65,738	45,03
	c) Replacement Charge				2,310	4.700	18,889	12,94
	d) Share to Net Surplus(%)							
	Total				89.3%	67.4%	48.5%	50.29
	Water Charge				69.3%	52.4%	37.7%	39.09
	Replacement Charge				19.9%	15.1%	10.8%	11.29

Note: Operating sizes of farm are the sampling result of JICA Farm Survey.

FIGURES

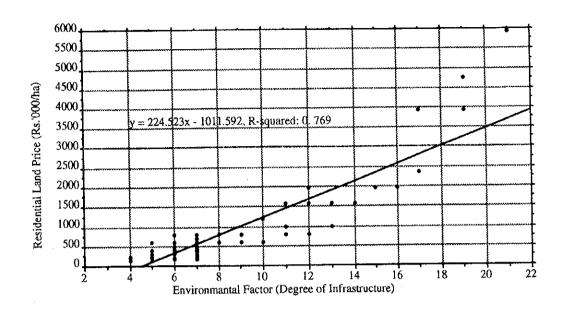


Fig. I.2.3.1 Comparison of Residential Land Price and Environmental Condition (1/2) (Linear Regression)

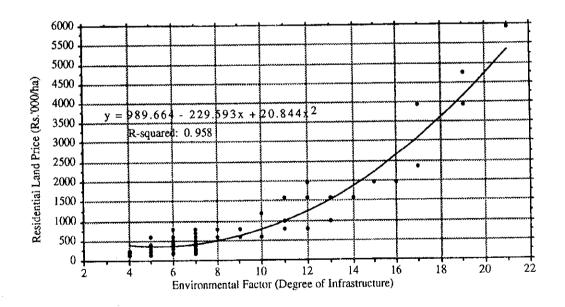


Fig. I.2.3.1 Comparison of Residential Land Price and Environmental Condition (2/2) (Polynomial Regression)

ANNEX J

ENVIRONMENT

ANNEX-J

ENVIRONMENT

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ANNEX J. ENVIRONMENT

J.1 Environmental Impact Assessment

Environmental Impact Assessment (EIA) carried out in the Study can be shown as Environmental Impact Assessment Table (EIA Table J.1.1 to J.1.3). EIA Table is attached in this Annex.

J.2 Environmental Planning And Management

In the long term, the environmental management activities of such a major developmental Project would need to be undertaken by a relevant local environmental department. The subject of environment is new in this country and at present all environmental institutions are facing problems of recent establishment, understaffing, under-funding and lack of transport and laboratory facilities. However, various projects are either started or are going to be started very soon for the strengthening of these institutions.

Based on the expected potential of these environmental institutions after completion of the proposed project, the responsibility for the long-term environmental management of this project could be given to the following institutions.

- the Environmental Section of the NWFP Planning, Environment and Development (PE & D) Department;
- the NWFP Environmental Protection Agency (EPA);
- the WAPDA Environmental Cell (WEC), based in Lahore.

The WAPDA Environmental Cell (WEC) has been recently established in Lahore, under the ADB-funded project "WAPDA Strengthening of Environmental Management for Water Resources Development". After completion of this project the WEC would have developed the capabilities for the environmental management of this project. However, the WEC is probably not a feasible choice due the following two main reasons;

- WAPDA's policy to a have limited involvement in the long-term project operation.
- WEC's location in Lahore which makes it inconvenient for the institution to perform the ask of environmental monitoring and control of this project.

The Environment Section of the NWFP, PE&D department is involved in preparation and implementation of the Provincial Conservation Strategy (PCS) and its integration

with development planning which would give it some interest in the Project, but primarily through the provincial Environmental Protection Agency. This section currently with only one technical personal, has no plans in the near future to create any facilities for conducting such activities like monitoring and control. Therefore the Environment Section is also not a feasible choice to be given the responsibility of the long-term environmental management.

The EPA in NWFP has been brought within the PE & D department, at least for the next few years, and acts under the auspices of the Secretary, PE & D. Although at present the EPA, NWFP lacks any real capability and resources to take such a responsibility, but keeping in view the institutional strengthening programs, it is expected that until the completion of this lift irrigation project the agency will be well equipped and fully staffed to take the responsibility. The EPA receiving institutional strengthening under the World Bank project "Institutional strengthening of NWFP, EPA" from 1993-1998. This project will not only increase the EPA staffing from 28 to 103 during five years until 1998 but also supply the mobile laboratory and other equipment required for monitoring. Moreover the project also involves establishing regional offices in north and south of the province. For the southern regional office D. I. Khan is the most probable place to be chosen.

Thus the EPA, NWFP, seems to be the logical choice for environmental management of the Project, as through the PE&D it will have much closer governmental links with the DoI than does the WEC. But for this purpose the working relationship between the two departments (DOI & EPA) should be clearly chalked out before handling over the responsibility to EPA.

J.3 System of Preliminary Monitoring and Evaluation

(1) Aim

The principle guidelines for the system of initial monitoring and evaluation is described hereinafter in accordance with the result of the study. Their actual method will be decided at the future stage of detail design. Their objectives of this system in the Project are:

- i) to evaluate the change and the affection of the surrounding environment with the lapse of time.
- ii) to assess the working condition of environmental management plan.
- iii) to inspect the propriety of the EIA.

iv) to certify the negative or unexpected impacts at the earliest

(2) Contents

The following components should be included in the system of monitoring and evaluation at the future stage of detail design of this Project.

- i) Actual method for works and procedure.
- ii) Location and frequency as well as schedule and cost of samples during measuring and testing.
- iii) Evaluation of monitoring data regarding environment and the procedure and schedule for reporting.
- iv) Counter-action plan against unexpected and sudden environmental hazards if were created due the implementation of the Project.

(3) The guideline of working and procedure for monitoring

Monitoring and the required procedures for them should be conducted for the items selected in EIA. However, it seems that the issues may as well choose indispensable issues to the monitoring of the Project if it is difficult to manage the working schedule, the cost and so on.

The selection of monitoring items does not entirely have to adhere to the evaluation value of EIA, because one of the main objective of the system of environmental monitoring and evaluation is to counter-check the propriety of the result of EIA itself.

The general plan of monitoring for each environmental issue is as follows:

1) Physical Environment Impacts

a) Irrigation water availability

Measuring the situation of water distribution in the irrigation system from main canal up to on-farm. It should be intensively carried out during peak irrigation period (from the end of September till the middle of October) in dry season.

b) Quality of irrigation water

Monitoring of this factor is not necessary because the water quality for irrigation has been tested during this study and was found suitable for irrigation.

c) Groundwater level

Watertable should be measured periodically at the selected sampling sites. The monitoring of watertable will need special attention in of September when it reaches at peak level due to the irrigation water supply. Monitoring should be carried out every month during the first year and every three months from the second year of the project implementation. Similar data on the CRBC gravity command area can be collected with the association of SCARP monitored by WAPDA.

d) Quality of groundwater

Monitoring for the quality of groundwater should be carried out simultaneously with the monitoring of groundwater level at the same sites. They should be compared with the standard for drinking water of the Ministry of Health. It seems that monitoring once a year would be sufficient.

e) Surface run-off

The run-off discharge in the major Nullahs should be measured every month.

f) Flooding

The field investigation of flood damage should be carried out after any flood event Attention should be focused on the project facilities and the infrastructures in the command area and surroundings.

g) Hydrology on river system

Monitoring would be not required for the hydrology of Indus River.

h) Quality of river water

Monitoring is not necessary for the Indus River water. However, water in the nullahs of the Study Area should be tested in detail, at least once a year.

i) Salinity and alkalinity contained in the soil

Analysis should be carried out twice a year at those points where high salinity or alkalinity was recorded during the soil survey conducted for the project.

i) Soil erosion

Any major soil erosion in the project command area and surroundings should be checked every year.

k) Land availability/Land capability

Field reconnaissance on this matter should be done periodically.

2) Biotic Environment Impacts

The biotic environment is not expected to be significantly effected due to the project so there no need for monitoring in this regard.

3) Human Environment Impacts

a) Social / Economic/Institutional

Population should be checked from the data of national census, usually conducted after every ten years. The additional information on economy and health could be extracted from Annual Statistics published by the government. The monitoring and evaluation component regarding project benefit should be included at the detail design stage.

b) Human activity

Data for human activity/human life could be extracted from the data on social and economic benefits of the project. Agricultural Statistics could be very fruitful in this regard.

(4) Evaluation and reporting

The evaluation of monitoring should be reported at least once a year as a summary of the monitored environmental components. The evaluation process of monitoring is as follows:

- i) Analyzing and arranging annually, the information measured and collected for each component. The components which may require further detailed analysis should be pointed out.
- ii) Comparing all the collected data with the result of the Study conducted for this project. Warning system would be required in the early stages, in case, any

significant negative environment impacts was developed by the project implementation.

iii) Estimating the propriety of IEE conducted for this Study.

Moreover, the following contents should be described in the report.

- i) The situation (progress, data information and analysis) of monitoring works and investigation for each environmental components.
- ii) The detail description about the change of situation, the factors responsible for this change, the affected area in case there is a remarkable negative environmental impacts.
- iii) The verification of the propriety of IEE with amending (if necessary) the table of environmental impacts evaluation reported in this Study.
- iv) The plan for further monitoring and general cost estimation.

(5) Ability of implementation

Long-term environmental management responsibilities of the Project are proposed to be given to a department concerning the environmental conservation in the province of NWFP. as described in the section of environmental management plan. This organization will coordinate the monitoring and evaluate the data.

The cooperation of some other organizations would be required in the special fields such as monitoring and analysis of groundwater and salinity, for which cooperation with SCARP of WAPDA would be beneficial.

(6) Warning system against urgent environment impacts

The main objective of developing a warning system is to predict quickly the unexpected remarkable negative environmental impacts, caused suddenly by the implementation of the Project. Such an hazard can be recognized from the data obtained periodically during the monitoring. An early recognition would help in minimizing the damages and the amount of affected area.

The following procedure is proposed to be taken promptly when ever a serious negative environmental impacts has been anticipated.

- i) Examine the reliability of data and information.
- ii) Request for cooperation to another association or organization, in case, some judgment in special field is required.

- iii) Report to the concerned organizations.
- iv) Reconsider the contents, the frequency and the sites for monitoring.

The important points for executing the above proposed system would be that the specialists incharge of monitoring;

- can recognize the significance of negative impacts,
- have the ability to implement promptly the system
- obtain supports from other organization.

To fulfill these requirements, some specific training for monitoring would be necessary for the specialists incharge to understand the necessity and importance of the monitoring system.

TABLES

Table J.1.1 Physical Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact	† : Positive Impact pact : Toward Positive Impact	0: No Impact
Environmental component	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	MITIGATORY MEASURES
WATER	Surface water availability Surface water quality	Actual Actual	Actual Inundation flows originated from the mountain and hilly range are utilized as irrigation and some parts of domestic water. The occurrence and scale of the flows are unstable. Potential Indus river water is led in order to utilize as irrigation water. While inundation flows are discharged to the Indus by the improved drainage facilities. Actual Inundation flows originated from the mountain and hilly range contain the soil particles transported from large catchment area. The water quality indicate high density of salinity.	Large-scale flows often couse flood damages due to lack of drainage facilities in the site. There are negligible impacts owing to the change of the hydrological condition in the Indus. While the improvement of drainage system reduces the flood damages in the site and lower slopes to the Indus. Utilization for the irrigation water which is high density of salinity causes saline accumulation on the surface soil. These accumulation result in soil salinity.	↑	
		Potential	Potential Water quality of the Indus is quite suitable for irrigation.	Adoption of the Indus water mitigates saline accumulation on the surface soil.	0	

Table J.1.1 Physical Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact		† : Positive Impact Toward Positive Impact	0 : No Impact mpact
Environmental	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	d degree Impact Occur OFF-SITE	MITIGATORY MEASURES
WATER	Groundwater levels Actual Potenti	Actual Potential	Groundwater level under the site is There are no impacts. stable in depth among 15 m and 30 m. Inappropriate use during long-term The shallow depth of ground wafor irrigation water causes increase table result in waterlogging and of groundwater table.	Actual Groundwater level under the site is There are no impacts. stable in depth among 15 m and 30 m. Potential Inappropriate use during long-term The shallow depth of ground water for irrigation water causes increase table result in waterlogging and of groundwater table. soil salinity	0 →	0	Monitoring of the ground water level should be carried out continuously and periodically.
	Groundwater quality	Actual	Groundwater quality of the site is high density of salimity and mineral.	Utilization for the irrigation water by means of the tube-well causes saline accumulation on the surface soil.	→	0	
		Potential	Potential There are no changes of aspect.	The change to new irrigation system which don't utilize the ground water mitigates saline accumulation on the surface soil.	†	0	
	Flooding / Run-off Actual	Actual	Inundation flows originated from Flood damages caused in the the mountain and hilly range cause lying area are heavy losses to the flood in the site. property, communication syst canal, crops and human lives.	Flood damages caused in the low lying area are heavy losses to property, communication system, canal, crops and human lives.	→	-	
		Potential	Potential The inundation flow beds are Flood damages are mitigated by incorporated as one of the drainage improved inundation flow beds.	Flood damages are mitigated by improved inundation flow beds.	1	†	

Table J.1.1 Physical Environmental Impacts

				↓ : Negative Impact	† : Positive Impact	oct 0: No Impact
				. Jowald Ingality Impact	ı	
Environmental		- V	A CHETAT See BOTTENITE AT	ACTITAL and BOTTENITAL	Places and degree Environmental Impact Occur	COUR MITTIGATIORY
component	Environmental Issue	Actual of Potential	ACTORE and POLENTIAL ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACT	ON-SITE OFF-SITE	
		- 1				-
WATER	River morphology	Actual	in 110w	beds are eroded by the embankment which has been beds affects the		
			me nood.	proven by the ribba arrects are		
				spread of flood damages. While		
				the sediment eroded at the flow	→	
				bed is transported to the low		
				lying area, and result in some		
				damages there.		
		Potential	Potential Improved inundation flow beds are The spread of flood damages are	The spread of flood damages are		
			incorporated as one of the drainage diminished by the improved	ediminished by the improved	†	
			system.	drainage system.		
LAND	Soil salinity	Actual	Soil salinity in amounts deleterious There are no impacts.	s There are no impacts.		
			for plant growth is practically		0 0	
			non-existent in the area.			
		Potential	Potential Inappropriate irrigation during	Land availability deteriorate in		Practical use of the
			long-term gives rise to the	the damaged area, and the land will		monitoring data regarding
			logging by the linkage between	go to desertification.		groundwater level and
			ground surface and groundwater		→	analysis of periodically
			table. If groundwater involves			soil sampling test should
			higher ratio of dissolved soils, it			be done continuously.
			occurs the soil salinity problem.			
	Soil erosion	Actual	Notable soil erosion can not	There are no impacts.		
:	-		recognize on the site due to the		0	
			topographical condition of almost		•	
			flat.			
		Potential	Potential There are no changes of aspect.	There are no impacts.	0 0	

Table J.1.1 Physical Environmental Impacts

↓: Negative Impact
 ↑: Positive Impact
 ↑: Toward Negative Impact

Environmental Environmental Actual or ACTUAL and POTENTIAL ACTUAL and POTENTIAL ON-SITE Described in the site is mostly utilized for the cultivation and the descrifteational areas can broad utilized for the cultivation and the descrifteational areas can broad use and availability is very low. CLIMATE Macro-climate Actual The climate of the site is seru-arid Inhabitants and the repaints on and decrease wind speeds owing to mission and accurate or the site is seru-arid Inhabitants and their section of the data serial and decrease wind speeds owing to mission and accurate or the site is seru-arid Inhabitants and their sections of the data and storm to the site is seru-arid Inhabitants and their activity are post in microclimate. It add to humidity in the site. ATMOSPHERE Dust / Odor / Noise Actual There are not any aspects owing to reconstruct or the construction site and their economent are not any aspects owing to the construction of the data and their economent are constructed and their economent are not any aspects owing to the construction site and their economent are not any aspects owing the environment are not any aspects or the construction of the data and their economent are not any aspects or the construction of the data and their economent are not any aspects or the construction and their economent are not any aspects or the construction and their economent are not prominent are not prominent are not prominent are not prominent are not prominent. Brightly improve the construction are decreased and the construction of the and the construction of the and the construction and the construction and the construction of the construction and the construction and the construction and the construction and the construction are decreased to the mare localized change of atmosphere component activities may be affected by the construction and the important activities and the construction and the construction and the important activities and the construction and the important activities and the construction and the								
Environmental Actual or ACTUAL and POTENTIAL ACTUAL and POTENTIAL Environmental Impact Occur						Places and	l degree	
Land use	Environmental	Environmental	Actual or	ACTUAL and POTENTIAL	ACTUAL and POTENTIAL	Environmental	Impact Occur	MITIGATORY
Land use Actual The land in the site is mostly Merely wastelands and utilized for the cultivation and the desertificational areas can inviscot for the cultivation and the desertificational areas can investock farming. However, the recognize in the site due to land availability is very low. Caused by severe climate. Potential Land use and availability in the improvement of the land availability in the improvement of the irrigation availability reduce the sprad of implementation of the irrigation availability reduce the sprad of development. Micro-climate / Actual The climate of the site is semi-arid Inhabitants and their activity are development. Potential The expansion and frequently in the site. SPHERE Dust / Odor / Noise Actual There are not any aspects of any spects of among the construction of ingrate and decrease wind speeds owing to effectiveness of created construction size. SPHERE Dust / Odor / Noise Actual There are not any aspects the construction site and their changes of atmosphere component actual changes of atmosphere control control change of atmosphere control change of atmosph	component	Issue	Potential	ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACT	ON-SITE - 0 +	OFF-SITE - 0 +	MEASURES
livestock farming. However, the recognize in the site due to land availability is very low. Land use and availability is very low. Land use and availability in the land availability is very low. Land use and availability in the land availability is very low. Land use and availability in the land availability reduce the spread of implementation of the irrigation wastelands and desertificational development. The climate of the site is semi-arid. Inhabitants and their activity are Dust and storm occur of the obstructed by the dust and frequently in the site. The climate of the site. The climate of the site is semi-arid. Inhabitants and their activity are of the dust and frequently in the site. The climate of the site. The climate of the site is semi-arid. Inhabitants also mitigate. The expansion and and storm seems to decrease. Slightly improve the middly inhabitants also mitigate. There are not any aspects regarding atmosphere component The inhabitants who lives near the contruction site and their environment. The inhabitants may be affected by the charge of atmosphere environment. The are not prominent are more prominent are defined to tharge of atmosphere environment.	LAND	Land use	Actual	The land in the site is mostly	Merely wastelands and			
land availability is very low. caused by severe climate. al Land use and availability in the site improve cowing to the implementation of the irrigation areas. The climate of the site is semi-arid. Inhabitants and their activity are bust and sorm occur often obstructed by the dust and frequently in the site. The climate of the site is semi-arid. Inhabitants and their residence has rately broken by them. The climate of the site is semi-arid. Inhabitants and their activity are often obstructed by the dust and frequently in the site. The climate of the site is semi-arid. Inhabitants and their seidence has rately broken by them. The climate of the site is semi-arid. Inhabitants and the dust and intensification of irrigated land and some seems to decrease. Silgally improve the microclimate, it add to humidity inhabitants also mitigate. Therefore, the damages of reated oasis. There are not any aspects Therefore, the damages of the component besides the occurrence of dust problem in climate component are more prominent are more prominent are more prominent are demonsary. The climate of the site is semi-arid. Inhabitants who lives near changes of atmosphere environment. The inhabitants who lives near changes of atmosphere environment. The inhabitants and temporary.				united to the cultivation and air	cocoming in the cite due to		c	
lail Tand use and availability in the implementation of the irrigation of the site is semi-arid. Inhabitants and their activity are Dust and storm occur and storm occur. The climate of the site is semi-arid. Inhabitants and their residence has rarely broken by them. The climate of the site is semi-arid. Inhabitants and their residence has rarely broken by them. The climate of the site is semi-arid. Inhabitants and their residence has rarely broken by them. The climate of the site is semi-arid. Inhabitants and their are not irrigated land sand storm seems to decrease. slightly improve the microclimate, it add to humidity inhabitants also mitigate. There are not any aspects There are no impacts. There are not any aspects There are no impacts. There are note of dust problem in climate component the construction stage, some the contruction stage, some the construction stage, some the construction stage, some the construction stage, some charge of atmosphere environment are more prominent activities may be affected by the the and temporary.	-			nvestock farming. However, the	deterioration of land availability	•	>	
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slightly improve the microclimate, it add to humidity inhabitants also mitigate. Therefore, the damages of mitigate. and decrease wind speeds owing to effectiveness of created oasis. There are not any aspects regarding atmosphere component besides the occurrence of dust problem in climate component. The inhabitants who lives near changes of atmosphere environment are more prominent are more prominent are localized charge of atmosphere environment. and temporary.			Potential	The expansion and	The occurrence of the dust and			
slightly improve the microclimate, it add to humidity inhabitants also mitigate. and decrease wind speeds owing to effectiveness of created oasis. There are not any aspects regarding atmosphere component besides the occurrence of dust problem in climate component. In During construction stage, some the construction site and their changes of atmosphere changes of atmosphere charge of atmosphere environment are more prominent are localized charge of atmosphere environment. There are no impacts. O 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				intensification of irrigated land	sand storm seems to decrease.			
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and decrease wind speeds owing to effectiveness of created oasis. There are not any aspects regarding atmosphere component besides the occurrence of dust problem in climate component. In During construction stage, some the construction site and their changes of atmosphere are nore prominent are more prominent are more prominent are localized charge of atmosphere environment. In During construction stage, some the construction site and their changes of atmosphere construction site and their activities may be affected by the the them are localized charge of atmosphere environment.				microclimate, it add to humidity	inhabitants also mitigate.		>	
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There are not any aspects regarding atmosphere component besides the occurrence of dust problem in climate component. al During construction stage, some changes of atmosphere more prominent are more prominent are more prominent are localized charge of atmosphere environment. There are no impacts. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				effectiveness of created oasis.				
The inhabitants who lives near the construction site and their activities may be affected by the charge of atmosphere environment.	ATMOSPHERE	Dust / Odor / Noise	Actual	There are not any aspects	There are no impacts.			
The inhabitants who lives near the construction site and their activities may be affected by the charge of atmosphere environment.	,			regarding atmosphere component		C	0	
The inhabitants who lives near the construction site and their activities may be affected by the charge of atmosphere environment.				besides the occurrence of dust		>		
The inhabitants who lives near the construction site and their activities may be affected by the charge of atmosphere environment.				problem in climate component.				
the construction site and their cativities may be affected by the charge of atmosphere environment.			Potential	During construction stage, some	The inhabitants who lives near		Ę	ese impacts can eliminate
vrominent activities may be affected by the calized charge of atmosphere environment.				changes of atmosphere	the construction site and their		th	ough the appropriate
m are localized charge of atmosphere environment.		*		environment are more prominent	activities may be affected by the	-	0	nsideration for the
and temporary				but most of them are localized	charge of atmosphere environment		act	ivities by the contractors.
				and temporary.				

Table J.1.2 Biotic Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact		↑ : Positive Impact→ : Toward Positive Impact	0: No Impact
Environmental component	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	l degree Impact Occur OFF-SITE - 0 +	MITIGATORY MEASURES
FAUNA	Bird communities/ habitats Reptile communities/ habitats	Actual Potential Actual	Actual The water birds issue is a very minor issue because there is not present any permanent wetland fauna. The so-called wetlands are only seasonal and are very limited in the extent. Similarly, the water birds the are attracted by these seasonal wetlands are very few in number. Potential There are few changes of aspects. Actual There is having a substantial number of lizards and other reptile species in the out-of- command areas and in the gullied lands. Potential There are few changes of aspects.	There are no impacts. There are no impacts. There are no impacts.	0 0	0 0 0	
FLORA	Forests / Trees / Other terrestrial vegetation	Actual Potential	Actual There is no endemic flora in the site. Potential There are few changes of aspects.	There are no impacts. There are no impacts.	0 0	0 0	

Table J.1.3 Human Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact	↑: Positive Impact pact →: Toward Positive Impact	0: No Impact
Environmental	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	MITIGATORY MEASURES
SOCIAL	Human carrying capacity	Actual Potential	Actual The human carrying capacity, which is attributed to low farm productivity due to traditional agriculture, is still in low level. Potential Increase of human carrying capacity is expected by means of improvement of agricultural	The low capacity accelerate outflow of labor force to town areas. Increase of human carrying capacity contributes to control the labor force outflow.		
	Population growth	Actual	productivity. Vital statistics shows that this area is extremely thin population.	There are no impacts.	0 0	
		Potential	Potential Improved food supplies mean The population growth is better nutrition and leading to to negative aspect because lower mortality rates. Added to substantial number of latinis is accelerated immigration and expected for intensity of a slowing of outflow.	The population growth is unlikely to negative aspect because a substantial number of labor force is expected for intensity of agricultural productivity at the vast area.	. 0 +	
·.	Demographic structure	Actual	Young generation is likely to outmigration to town areas due to the scarce circumstances of employment opportunity.	There are few significant impacts.	0 0	
		Potential	Potential Labor force requirement for agricultural activities due to increase of employment opportunity slightly reduces the out migration of young generation.	Settlement of young generation seems to contribute toward a rural activation.	1 0	

Table J.1.3 Human Environmental Impacts

		-	Lable John Human Karva on			
				↓ : Negative Impact← : Toward Negative Impact	† : Positive Impact	0: No Impact
Environmental component	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	MITIGATORY MEASURES
SOCIAL	Land tenure Social equity Social cohesion	Actual Actual Potential Actual Actual	Actual Almost land has already been instituted tenure right. Although the number of large land owner is limited, the share to the whole land is very high. While numerous marginal and small land owners have remaining small land. Potential There are few changes of aspect. Actual Social inequity affected the scale of land tenure exists in the site. Potential There are few changes of aspect. Actual Tribal social cohesion and power dispute can not recognize in the site. While some areas have the social cohesion regarding the usage of the flood irrigation (Rod Kohi) system.	There are no impacts. There are no impacts.		
		Potential	formed in the is dissolved stem.	There are no impacts.	0 0	
				-		

Table J.1.3 Human Environmental Impacts

0: No Impact considered in cooperation Improvement of facilities MITIGATORY MEASURES for health should be with PHED. →: Toward Positive Impact Environmental Impact Occur OFF-SITE † : Positive Impact Places and degree 0 ON-SITE ţ ↓ : Negative Impact← : Toward Negative Impact ENVIRONMENTAL IMPACT the low level of productivity and The difference of productivity is ACTUAL and POTENTIAL among infant. Similarly, nitrate groundwater used for domestic The lower areas are compelled water supplies are considered Waterborne intestinal disease Health condition of the habitants in Waterborne intestinal disease occurs frequently, especially occurs more frequently and accumulation according to injurious for human health. expansively. mitigated. channels or distributors are entitled income. for irrigation solves the problem of difference regarding social attitude to receive irrigation supply before population growth for the Project. There are few facilities for health ENVIRONMENTAL ASPECT Therefore, this situation makes a the lower ones. The lower areas he site deteriorates owing to the such as Basic Health Unit (BHU) Potential The health and sanitary situation attains appropriate water supply short of domestic water supplies knowledge regarding health and ACTUAL and POTENTIAL Rod Kohi system, the upstream and the insanitation. Add to the In accordance with the rule of are suffered from the short of between upstream and lower. Potential New irrigation system which difference regarding social becomes worse because of nabitants don't have any irrigation water supply. sanitation. Actual or Potential Actual Actual Environmental Social attitude Health Issue Environmental component SOCIAL

Table J.1.3 Human Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact	† : Positive Impact	0: No Impact
Environmental component	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	MITIGATORY MEASURES
HUMAN USE	Cultivation	Actual	The cultivation, of which the methods are flood irrigation, groundwater irrigation by tubewell, and rainfed, has low and unstable productivity.	Low and unstable productivity affects low farm income.	0	
		Potential	Potential High farm productivity and increase of cultivated area are attained by adequate irrigation water supply.	High farm income, investment and employment opportunity are realized by improvement of the irrigation system.	0 ↓	
	Livestock	Actual	Mainly goat and sheep are raised as livestock. Iivestock farming is grazed on the glassland along the inundation flows.	Grazing on the riverside cause the soil erosion.	0	
		Potential	Potential The productivity of feed crops are intensified, and feeder can also get the chance to strengthen livestock carrying capacity.	Soil erosion at the riverside is mitigated.	0	
	Agro-industrial activities	Actual	Agro-industrial activities of rice mill, flour mill, oil mill, oil extraction plant, and sugar mill can recognize in the site, though some mills can not seasonally operate due to unstable farm	activities of rice Processing facilities of which the bil mill, oil rate of operation is unfavorable and sugar mill can have the unemployment problem. site, though tot seasonally is stable farm	0	
		Potential	Potential Agro-industrial activities become The improvement of the prosperous by means of increase of operation gives the chance of farm productivity.	The improvement of the i operation gives the chance of employment.	0	

Table J.1.3 Human Environmental Impacts

				↓ : Negative Impact← : Toward Negative Impact	 + †∶	Positive Impact Toward Positive Impact	0: No Impact
Environmental	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE	degree mpact Occur OFF-SITE	MITIGATORY MEASURES
4					+ 0 -	+ 0	
HUMAN USE	Transport	Actual	The improvement of transport communication network in the	The interruption of transport communications affect human			
			site gets behind. Some transport	and other activities.	>	0	
			communications often are cut by the floods.				
		Potential	The maintenance roads along	The proposed farm roads			
			the Main canal, Districutaries	facilitate human and other	1	0	
			and Minors of the Project are	activity and marketing.		>	
			used as farm roads.				
	Domestic water	Actual	The domestic water is supplied	The quantity and quality cause			
	supply		by the groundwater and/or	the problem regarding health and			
			surface water stored in the small	sanitation.	_	c	
-			tank. The quantity is often short,	:	•		
			and the quality is not so good.				
	-	Potential	There are few changes of aspect	Although the shortage of the		S	Some facilities for the
			because the component for	domestic water is compensated to		о <mark>р</mark>	domestic water supply
			domestic water supplies is not	the only areas around the ponds,		o shc	should be improved in
			included besides regulating	there are few changes of impact	•		cooperation with PHED in
•			ponds used as domestic water	as a whole.		oro	order to supply stable water.
			only around the ponds.				
	Recreation	Actual	There aren't any recreation	There are no impacts.	C	_	
	-		facilities in the site.		>	,	
		Potential	The proposed regulation ponds	Activation of the social community			
			are expected to act as recreation	is expected at the areas around	-	0	
			area.	the ponds.			
				-			

Table J.1.3 Human Environmental Impacts

		:		↓: Negative Impact←: Toward Negative Impact		0: No Impact
Environmental component	Environmental Issue	Actual or Potential	ACTUAL and POTENTIAL ENVIRONMENTAL ASPECT	ACTUAL and POTENTIAL ENVIRONMENTAL IMPACT	Places and degree Environmental Impact Occur ON-SITE OFF-SITE - 0 + - 0 +	MITIGATORY MEASURES
HUMAN USE	Energy supply / Utilization	Actual Potential	The rate of electrical energy supply There are no impacts. is recently raised due to progress of power plant construction. The electrical energy demand for There are no impacts. the pump operation on the Project is supplied by the implementation of the new power planed near the site.	There are no impacts. There are no impacts.	0 0	
ECONOMIC	Income	Actual Potential	Actual Farm income is very low due to unstable farm productivity. Livelihood of marginal and small owners depend on casual labor employment. Potential Slightly increase of farm income with improvement of farm and related industrial productivity is expected by means of stable irrigation water supply.	The short of the money lett over means the deficiency of investment for the next chance to crop, and it cause a decline in farmers' volition for the farm productivity and a depreciation of living standard. Increase of investment incentive and improvement of living standard are expected with increase of farm income.	0 0	
	Employment	Actual Potential	Employment opportunity remains Outflow of labor force is in a low level due to a stagnation of agro-economy. Employment opportunity is created Created employment opportunity by activation of farming practice affects decrease of with strengthening of farm outflow of labor force.	Outflow of labor force is incurred due to low employment opportunity in the rural area. I Created employment opportunity affects decrease of unemployment, and controls outflow of labor force.	0 •	

↓: Negative Impact
 ↑: Positive Impact
 ←: Toward Positive Impact

Table J.1.3 Human Environmental Impacts

					Places and degree	degree	
Environmental	Environmental	Actual or	ACTUAL and POTENTIAL	ACTUAL and POTENTIAL	Environmental Impact Occur	Impact Occur	MITIGATORY
component	Issue	Potential	ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACI	ON-SILE - 0 +	OFF-511E - 0 +	MEASURES
CULTURAL	Historic/ archaeological sites	Actual	One of archaeological sites inferred to have been in pre-findus Valley Civilization exists in the site. However, it has not been preserved after excavated Around this site human and their activity for the flour cropping in winter season can recognize. In addition, this site is not recognized as archaeological site by the	This site may be damaged by the human and other activities.	→	0	
		Potential	Although this site is excluded from Damages to this site increase	Damages to this site increase			Preservation for the
	:		the irrivation developed area, the	further due to improvement of			archaeological site should
. '			traffic for human and other	social economy and population	→	0	be considered.
			activities increases through and	growth of the surrounding area.			
			around this site.				
·	Lifestyle	Actual	Living standard is very low owing to the low income.	Living condition which has been damaged by natural disaster is not improved due to the short of the		·	
				left money in household economy.	→	0	
				While almost inhabitants in the site	A		
				don't have any interestings to and			
				chances on the education.			
		Potential	Potential Improvement of the living	Inhabitants can get chances to			
			condition is expected by increase	improve the living condition and	←	0	
			of farm income and employment	education.			
			opportunity.				

