Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (1/17)

Scheme Name	Bahundanda	Sir Khola	Arjun Khola	Satbaria	Sonpur Natri
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Terai	Terai	Terai	Terai	Terai
Zone	Rapti	Rapti	Rapti	Rapti	Rapti
District	Dang	Dang	Dang	Dang	Dang
Village	Tribhuvan	Amiritpur	Chailah		Sonpur
Latitude	28°04'N	28°08'30"N	27°51'N		27°50'30"N
Longitude	82°28'E	82°17'30"E	82°29'30"E		82°34'30"E
River System	Babai/Karnali	Babai/Karnali	Rapti	Rapti	Rapti
Water Source	Sewar Khola	Sir Khola	Arjun Khola	Rapti	Burlaiya Khola
Type of Source	Perennial	Perennial	Seasonal	Perennial	Perennial
River Discharge (measured m3/s)	0.144(Falgun)	0.453(Apr.)	1.02(Oct.)		2.2 (Jun.)
Catchment Area (km2)	23.54	28	210.5		55.5
Irrigation Capability	YR	MS	MS	YR	YR
Gross Area (ha)	550	500			350
Net Area (ha)	440	450	504	1335	320
Altitude (m)	720	740	250		94
Main Canal (km)	5.97	6.94	1.65		9.9
Type of H/W	Weir	Trash Rack	Weir		Weir
Household	259	489	330		300
Population	1777	2945	4352		3,000
Cropping Intensity (%)	222	178	200	245	213
Total Cost (Rs.)	6,962,000	10,430,000	8,987,000		5,757,000
Unit Cost (Rs/ha)	15,800	23,200	17,800		18,000
IRR (%)	22.3	16.7	33.8		(EIRR) 34.4
Study Year	1983	1984	1985	1985	1991
Source of Data	F/S.R	F/S.R	F/S.R	MPID2.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (2/17)

Scheme Name	Sivapur Kulo	Chorahi Manpur	Sudi Kulo	Rehu Khola
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Terai	Terai	Terai	Terai
Zone	Rapti	Rapti	Rapti	Rapti
District	Dang	Dang	Dang	Bardiya
Village			Hapur Bijouri Narayanpur	
Latitude			28°04'30"N	
Longitude			82°26'E	
River System			Babai/Karnali	
Water Source			Hapur Khola	Rehunala
Type of Source			Perennial	
River Discharge (measured m3/s)			1.27 (Sep.)	
Catchment Area (km2)			20	
Irrigation Capability				YR
Gross Area (ha)			600	
Net Area (ha)			520	290
Altitude (m)			660	
Main Canal (km)			8	
Type of H/W			Weir	
Household			445	
Population			5,065	
Cropping Intensity (%)			155	255
Total Cost (Rs.)			2,458,000	
Unit Cost (Rs/ha)			4,700	
IRR (%)			44.6	
Study Year			1989	1984
Source of Data	MPID2.R	MPID2.R	F/S.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (3/17)

Scheme Name	Maranthana	Paklabesi	Lungrimadi	Khungrichaur	Banjh Kanda
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Rapti	Rapti	Rapti	Rapti	Rapti
District	Pyuthan	Pyuthan	Pyuthan	Rolpa	Salyan
Village	Maranthana	Pakia Baraula	Sari, Store, Bhingri Tapa, Barjibang	Khungri	Banjh Kanda
Latitude	28°08'N	28°01'30"N	28°00'N	28°13'N	28°25'N
Longitude	82°53'E	82°54'E	82°30'E	85°42'E	82°10'E
River System	Rapti	Rapti	Rapti	Rapti	Babai/Karnali
Water Source	Dharmabati Nadi	Jhimruk Khola	LungriKhola	DoukhuriKhola	Sharda
Type of Source	Perennial	Perennial	Perennial		Perennial
River Discharge (measured m3/s)	7.6	2.95 (Apr.)	0.81 (Apr.) 32.1 (Jul.)	0.06	0.3 (Jun.)
Catchment Area (km2)	200	1,070	331	2.25	177
Irrigation Capability	YR	YR	YR		YR
Gross Area (ha)	42	210	974	85	60
Net Area (ha)	40	180	780	60	54
Altitude (m)	853	950	1,773	645	1,105
Main Canal (km)	4.6	8.15	29.65	6.98	8.18
Type of H/W	Spur Weir	Trash Rack	Bottom Intake	Trash Rack	
Household	96			400	215
Population	575	6,225	13,660	2,800	1,505
Cropping Intensity (%)	175	225	225	250	224
Total Cost (Rs.)	2,100,000	6,128,000	27,189,000	3,192,000	4,517,000
Unit Cost (Rs/ha)	52,500	34,100	27,900	53,200	83,600
IRR (%)		19.3	15.7	17.6	8.1 (EIRR)
Study Year		1988	1985	1982	1991
Source of Data	F/S.R	F/S.R	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (4/17)

Scheme Name	Gatte Khola	Majaoo Khola	Kamal Pokhari	Nathigad	Kotihari
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Rapti	Rapti	Rapti	Rapti	Rapti
District	Rukum	Rukum	Rukum	Rukum	Rukum
Village	Shova	Peugha Nuwakot	Shove	Syalapakha	
Latitude	28°37'30"N	28°35'N	28°18'N	28°37'N	
Longitude	82°35'E	82°22'30"E	82°48'E	82°33'E	
River System	Bheri/Karnali	Bheri/Karnali	Bheri/Karnali	Bheri/Karnali	
Water Source	Ghatte Khola Nathigad	Bagmare Khola Kain Khola	Ghatte Khola	Nathigad	
Type of Source		Perennial		Perennial	
River Discharge (measured m3/s)	Ghatte 0.01(Feb.) Nathi 0.11 (Jan.)	0.01 (Apr.) 0.01 (Apr.)	0.1	0.43 (Feb.)	
Catchment Area (km2)	17.67	2.02 1.43		0.3	
Irrigation capability	YR	YR		YR	
Gross Area (ha)	102	71.3	400	65	
Net Area (ha)	58	41.5	150	50	
Altitude (m)	1,050	1,300		1,470	
Main Canal (km)	2.7	3.6		1.6	
Type of H/W	Trash Rack	Trash Rack	Side Intake	Trash Rack	
Household	241	78		100	
Population	4,404	780		700	
Cropping Intensity (%)	145	214		214	
Total Cost (Rs.)	3,426,000	1,839,000	9,596,000	3,697,000	
Unit Cost (Rs/ha)	59,000	44,300	64,000	73,900	
IRR (%)				12.1	
Study Year	1982	1982		1988	
Source of Data	F/S.R	F/S.R	F/S.R	F/S.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (5/17)

Scheme Name	Babiyachaur	Salkot	Kaprichaur	Khorkekhola	Rawatkot
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Bheri	Bheri	Bheri	Bheri	Bheri
District	Surkhet	Surkhet	Surkhet	Surkhet	Dailekha
Village	Babiyachaur	Babiyachaur Vidyapur	Kaprichaur	Birendranagar	Rawatkot, etc.
Latitude		28°48'N	28°31'30"N	28°36'30"N	28°54'N
Longitude		81°23'E	82°00'E	81°36'30"E	81°39'E
River System	Bheri/Kamali	Bheri/Kamali	Bheri/Kamali	Bheri/Kamali	Kamali
Water Source	Apsaini Khola Khamare Khola	Bhyagutae Khola Khamarae Khola	Simta Khola	Khorke Khola Baspani Khola	Sano Khola
Type of Source			Perennial	Perennial	Perennial
River Discharge	0.03 (Mar.)	0.105 (Sep.)			
(measured m3/s)	0.08 (Mar.)	0.165 (Sep.)	0.30	0.075 (Jan.)	2.17 (Jul.)
Catchment Area	0.78	6.30			
(km2)	0.47	3.94	80.0	12	42.3
Irrigation Capability	MS	YR	YR	YR	YR
Gross Area (ha)	350	770	300	112	516
Net Area (ha)	325	300	225	108	475
Altitude (m)	420	390	690	760	916
Main Canal (km)	7.1	11.9	7.4	1.38	18.7
Type of H/W	Weir	Trash Rack	Trash Rack	Weir	Trash Rack
Household	780	763	350	422	
Population	5,000	4,472	3,161	2,500	13,127
Cropping Intensity (%)	175	200	265	218	200
Total Cost (Rs.)	23,488,000	10,513,000	4,376,000	2,808,000	17,231,000
Unit Cost (Rs/ha)	72,300	35,000	19,500	26,000	36,000
IRR (%)	18.5 (EIRR)	10.3		17.4	35.0
Study Year	1987	1984	1982	1985	1985
Source of Data	F/S.R	F/S.R	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (6/17)

Scheme Name	Nalgad	Holu Bhairabi Khola	Daha Khola
Region	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Hill	Hill	Hill
Zone	Bheri	Bheri	Bheri
District	Jajarkot	Jajarkot	Jajarkot
Village	Dalli	Khalanga	Nayakwada
Latitude	28°48'N	28°42'N	28°55'N
Longitude	82°18'E	82°12'E	82°15'E
River System	Bheri/Karnali	Bheri/Karnali	Bheri/Karnali
Water Source	Nalgad	Holu Khola	Daha Khola
Type of Source	Perennial	Perennial	Perennial
River Discharge (measured m3/s)	23 (Apr.)	0.20	0.52 (May)
Catchment Area (km2)	675	17.5	24
Irrigation Capability	YR	YR	
Gross Area (ha)	86	52	330
Net Area (ha)	48	47	230
Altitude (m)	1,000	660	2,000
Main Canal (km)	5.07	3	5.6
Type of H/W	Weir	Trash Rack	Trash Rack
Household	112	341	430
Population	1,000	2,181	2,795
Cropping Intensity (%)	204	200	192
Total Cost (Rs.)	3,042,000	2,697,000	31,087,000
Unit Cost (Rs/ha)	63,400	57,400	135,000
IRR (%)		13.5	15.3
Study Year	1,982	1982	1988
Source of Data	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (7/17)

Scheme Name	Chaila	Juphal	Garjyangkot	Dhupijyula	Ukhadi Khola
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Karnali	Karnali	Karnali	Karnali	Karnali
District	Dolpa	Dolpa	Jumla	Jumla	Kalikot
Village					Dhaulagoh
		Juphal	Garjyangkot		Khin
Latitude		28°59'N	29°15'N		29°20'30"N
Longitude		82°50'E	82°15'E		81°48'E
River System	/Karnali	Bheri/Karnali	Tila/Karnali	Tila/Karnali	Karnali
Water Source	Ghungharu	Khur Khola	Talpunera Khola	Tilanadi	Ukhadi Khola
					Snowfed
Type of Source		Perennial	Perennial		Perennial
River Discharge					
(measured m3/s)		0.15 (Mar.)	0.77 (Aswin)		1.08 (Apr.)
Catchment Area					
(km2)			15.75		30.6
Irrigation					
Capability	YR		YR	YR	YR
Gross Area (ha)		100	240		300
Net Area (ha)	110	60	200	200	215
Altitude (m)		2,900	2,550		
Main Canal (km)		5.1	5.6		19
Type of H/W		Trash Rack	Weir		
Household		240	216		1,447
Population		1,450	1,500		9,500
Cropping					
Intensity (%)		195	200		202
Total Cost (Rs.)		2,340,000	10,688,000		7,109,000
Unit Cost (Rs/ha)		39,000	53,400		33,100
IRR (%)		19.5	16.6		
Study Year	1984	1988	1986		1985
Source of Data	MPID2.R	F/S.R	F/S.R	MPID2.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (8/17)

Scheme Name	Jubitha	Natharpur	Dhilamghatta	Sanya	Yanchu
Region	Mid. Western	Mid. Western	Mid. Western	Mid. Western	Mid. Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Karnali	Karnali	Karnali	Karnali	Karnali
District	Kalikot	Mugu	Mugu	Humla	Humla
Village	Jubitha	Natharpur	Karkibada	Sanya	Yanchu
Latitude	29°08'30"N	29°40'N	29°31'N	29°47'N	29°56'N
Longitude	81°48'30"E	81°55'E	82°07'30"E	81°57'E	81°55'E
River System	Tila/Karnali	Mugu Karnali/ KaraliMugu	Mugu Karnali/ KarnaliHumla	Humla Karnali/ KarnaliHumla	Humla Karnali/ Karnali
Water Source	Khanlagad Khola	Humla Karnali	Kaligad	Sanya Khola	Yanchu Khola
Type of Source	Perennial		Perennial	Perennial	Perennial
River Discharge (measured m3/s)	0.45 (May)		0.29 (Apr.)	0.01 (Apr.)	0.90
Catchment Area (km2)	13.8		18	2.22	2.22
Irrigation Capability		YR	MS	YR	MS
Gross Area (ha)	135	75	156	68	38
Net Area (ha)	100	60	141	60	30
Altitude (m)	2,300		2,100	2,000	2,100
Main Canal (km)	4.0	4.7	4.92	0.95	4.2
Type of H/W	Weir		Trash Rack	Trench	Bottom Weir
Household			307	86	50
Population			1,600	600	315
Cropping Intensity (%)		183	143	190	187
Total Cost (Rs.)	899,000	39,004,000	11,947,000	23,400,000	4,208,000
Unit Cost (Rs/ha)		650,100	84,700	39,000	140,300
IRR (%)			14.7	19.5	
Study Year	1987	1985	1988	1988	1987
Source of Data	F/S.R	F/S.R	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (9/17)

Scheme Name	Kalapani	Maleria Nala	Lungreli Parbali	Dipayal	Bhmirajmandu
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Terai	Terai	Hill	Hill	Hill
Zone	Mahakali	Mahakali	Seti	Seti	Seti
District	Kanchanpur	Kanchanpur	Achham	Doti	Doti
Village	Pitambar, etc.	Chandari			
Latitude		28°57'N			
Longitude		80°10'E			
River System	Mahakali	Mahakali			
Water Source	Sihali, Toti Nala	Maleria Nala	Lungreli, Parbali	Dware, Godre Khola	Salyanigad
Type of Source		Perennial			
River Discharge (measured m3/s)	0.18 (Jan.) 0.12 (Jan.)	0.75			
Catchment Area (km2)	14.25 9.75				
Irrigation Capability	MS	YR	YR	YR	YR
Gross Area (ha)	1,200	2,000			
Net Area (ha)	649	1,800	142	100	100
Altitude (m)	230	102			
Main Canal (km)	8.86	7.9			
Type of H/W	Trash Rack	Weir			
Household	579	619			
Population	4,010	2,000			
Cropping Intensity (%)	203	235	190	215	196
Total Cost (Rs.)	7,528,000	14,328,000			
Unit Cost (Rs/ha)	11,600	7,960			
IRR (%)	12.6	48.0			
Study Year	1985	1987	1987	1986	1986
Source of Data	F/S.R	F/S.R	MPID2.R	MPID2.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (10/17)

Scheme Name	Kadamandu	Bandungrasain	Mastamandu	Kaflebari II	Latamandu
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Seti	Seti	Seti	Seti	Seti
District	Doti	Doti	Doti	Doti	Doti
Village					
Latitude					
Longitude					
River System	/Karnali	/Karnali	/Karnali	/Karnali	/Karnali
Water Source	Gandigad	Ghattegad	Sailighat	Pilegad	Talkotgad
Type of Source					
River Discharge (measured m3/s)					
Catchment Area (km2)					
Irrigation Capability	YR	YR	YR	YR	YR
Gross Area (ha)					
Net Area (ha)	140	155	102	25	120
Altitude (m)					
Main Canal (km)					
Type of H/W					
Household					
Population					
Cropping Intensity (%)	250	227	257	200	200
Total Cost (Rs.)					
Unit Cost (Rs/ha)					
IRR (%)					
Study Year	1987	1987	1986	1988	1988
Source of Data	MPID2.R	MPID2.R	MPID2.R	MPID2.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (11/17)

Scheme Name	Kaflebari I	Mudegaon	Gilla	Sakayal	Doti Khola
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Seti	Seti	Mahakali	Mahakali	Mahakali
District	Doti	Doti	Dadeldhura	Dadeldhura	Dadeldhura
Village			Beiapur	Mashtamandu	Bagarkot
Latitude			29°15'N	29°17'N	29°17'N
Longitude			80°37'30"E	80°43'E	83°30'E
River System			Rangun Khola/ Mahakali	Rangun Khola/ Mahakali	Sumayagad/ Mahakali
Water Source	Talkogad	Kalagad	Sakail Khola	Sakayal Khola	Doti Khola
Type of Source			Perennial	Perennial	
River Discharge (measured m3/s)			0.85 (Falgun)	0.99 (Jestha)	0.24
Catchment Area (km2)			38	38	30
Irrigation Capability	YR	YR	MS	YR	
Gross Area (ha)			107.0	130.0	
Net Area (ha)	60	60	85.5	100.0	170
Altitude (m)			1,000	680	1,500
Main Canal (km)			11.4	5.0	
Type of H/W			Trash Rack	Side Intake	
Household			192	165	103
Population			1,460	1,320	450
Cropping Intensity (%)	200	200	170	100	100
Total Cost (Rs.)			8,323,000	5,442,000	18,000,000
Unit Cost (Rs/ha)			97,300	54,400	105,900
IRR (%)			4.2	10.8	
Study Year	1988	1988	1984	1987	
Source of Data	MPID2.R	MPID2.R	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (12/17)

Scheme Name	Sirse-Khola	Sunwagadi	Satgad Kulo	Dilleswori M.B.	Dumanigad
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Hill	Hill	Hill	Hill	Hill
Zone	Mahakali	Mahakali	Mahakali	Mahakali	Mahakali
District	Dadeldhura	Baitadi	Baitadi	Baitadi	Baitadi
Village	Sirse	Bhumiraj	Mallahdehi	Hat	Taligada
Latitude	29°08'30"N	29°32'N	29°32'N	29°36'N	29°24'25"N
Longitude	80°21'E	80°42'E	80°41'E	80°41'E	80°34'50"E
River System	Rangun Khola/ Malakali	Sumayagad/ Malakali	Sumayagad/ Malakali	Chamiliya/ Malakali	Sumayagad/ Malakali
Water Source	Sirsegad	Swagadi	Satgad	Loligad	Dumanigad
Type of Source		Perennial	Perennial	Perennial	Perennial
River Discharge (measured m3/s)	0.52 (Mar.)	0.26 (Jan.)	0.11 (Jan.)	0.12 (Jan.)	0.004 (Feb.)
Catchment Area (km2)	56.6	2.54	24.97	23.4	1.38
Irrigation Capability	MS	MS	MS	MS	MS
Gross Area (ha)	313	86	85	92	35
Net Area (ha)	270	61	68	74	24
Altitude (m)	430	1,890	1,450		1,400
Main Canal (km)	7.7	3.2	3.68	4.25	1.28
Type of H/W		Trash Rack	Trash Rack	Trash Rack	Trash Rack
Household	61	162	372	95	19
Population	2,465	1,132	2,562	667	122
Cropping Intensity (%)		200	200	200	200
Total Cost (Rs.)		5,155,000	6,576,000	4,379,000	384,100
Unit Cost (Rs/ha)		85,200	96,700	59,200	16,100
IRR (%)		12.7	10.8	18.6	39.8
Study Year	1991	1984	1984	1984	1984
Source of Data	F/S.R	F/S.R	F/S.R	F/S.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (13/17)

Scheme Name	Kakari-Melghat	Kolti	Gothi	Martadi	Jukot
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Hill	Mountain	Mountain	Mountain	Mountain
Zone	Mahakali	Seti	Seti	Seti	Seti
District	Baitadi	Bajura	Bajura	Bajura	Bajura
Village	Bishalpur				Jukot
Latitude	29°22'10"N				29°21'N
Longitude	80°24'30"E				81°47'30"E
River System	Mahakali	/Karnari	/Karnari	/Karnari	Karnali
Water Source	Surnayagad	Badigad Khola	Kalagad	Bauligad	Bhatera Khola
Type of Source	Perennial				Perennial
River Discharge (measured m3/s)	1.74 (May)				0.00013
Catchment Area (km2)	416				1.62
Irrigation Capability		MS	YR	YR	MS
Gross Area (ha)					97
Net Area (ha)	65.5	150	80	65	65
Altitude (m)	650				1,800
Main Canal (km)	8.5				28.2
Type of H/W	Side Intake				Bottom Intake
Household	250				500
Population	1,750				3,152
Cropping Intensity (%)	246	200	200	200	
Total Cost (Rs.)	8,374,000				1,754,000
Unit Cost (Rs/ha)	127,800				27,000
IRR (%)	12.1				
Study Year	1988	1987	1987	1987	1988
Source of Data	F/S.R	MPID2.R	MPID2.R	MPID2.R	F/S.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (14/17)

Scheme Name	Juili	Thapagaon	Ritapata	Majhigaon	Deuraphant
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Seti	Seti	Seti	Seti	Seti
District	Bajhang	Bajhang	Bajhang	Bajhang	Bajhang
Village					
Latitude					
Longitude					
River System	Seti/Karnali	Seti/Karnali	Seti/Karnali	Seti/Karnali	Seti/Karnali
Water Source	Juiligad	Jogda Khola	Bauligad	Dhauligad	Kalangad
Type of Source					
River Discharge (measured m3/s)					
Catchment Area (km2)					
Irrigation Capability	YR	YR	YR	YR	MS
Gross Area (ha)					
Net Area (ha)	122	117	124	170	34
Altitude (m)					
Main Canal (km)					
Type of H/W					
Household					
Population					
Cropping Intensity (%)	220	200	200	200	259
Total Cost (Rs.)					
Unit Cost (Rs/ha)					
IRR (%)					
Study Year	1987	1987	1987	1987	1987
Source of Data	MPID2.R	MPID2.R	MPID2.R	MPID2.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (15/17)

Scheme Name	Pujarikot	Gairasela	Bisket	Khaira	Talkot-Dantoli
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Seti	Seti	Seti	Seti	Seti
District	Bajhang	Bajhang	Bajhang	Bajhang	Bajhang
Village					
Latitude					
Longitude					
River System	Seti/Karnali	Seti/Karnali	Seti/Karnali	Seti/Karnali	Seti/Karnali
Water Source	Sanigad	Khateranala	Runigad	Bauligad	Dantoligad
Type of Source					
River Discharge (measured m3/s)					
Catchment Area (km2)					
Irrigation Capability	YR	YR	YR	YR	YR
Gross Area (ha)					
Net Area (ha)	41	44	69	40	172
Altitude (m)					
Main Canal (km)					
Type of H/W					
Household					
Population					
Cropping Intensity (%)	246	236	242	200	200
Total Cost (Rs.)					
Unit Cost (Rs/ha)					
IRR (%)					
Study Year	1987	1987	1987	1988	1987
Source of Data	MPID2.R	MPID2.R	MPID2.R	MPID2.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (16/17)

Scheme Name	Bhandar Panesh	Kuchha	Pikhet	Paringal	Regam
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Seti	Seti	Seti	Seti	Seti
District	Bajhang	Bajhang	Bajhang	Bajhang	Bajhang
Village					
Latitude					
Longitude					
River System	Seti/karnali	Seti/karnali	Seti/karnali	Karnali	Seti/karnali
Water Source	Patalgad	Thalangad	Thalangad	Seti	Regam
Type of Source					
River Discharge (measured m3/s)					
Catchment Area (km2)					
Irrigation Capability	MS	YR	YR	YR	YR
Gross Area (ha)					
Net Area (ha)	86	47	105	100	50
Altitude (m)					
Main Canal (km)					
Type of H/W					
Household					
Population					
Cropping Intensity (%)	200	200	200	200	200
Total Cost (Rs.)					
Unit Cost (Rs/ha)					
IRR (%)					
Study Year	1987	1988	1988	1988	1988
Source of Data	MPID2.R	MPID2.R	MPID2.R	MPID2.R	MPID2.R

Table 3.3.2 INVENTORY OF THE SMALLER IDENTIFIED POTENTIAL IRRIGATION PROJECTS (17/17)

Scheme Name	Tontali	Kukuregad	Latinath	Dharigad	Dhap
Region	Far Western	Far Western	Far Western	Far Western	Far Western
Ecological Belt	Mountain	Mountain	Mountain	Mountain	Mountain
Zone	Seti	Mahakali	Mahakali	Mahakali	Mahakali
District	Bajhang	Darchula	Darchula	Darchula	Darchula
Village		Hikala	Latinath	Gokuleshwar	Dhap
Latitude		29°54'47"N	29°44'30"N	29°40'N	29°47'40"N
Longitude		80°36'20"E	80°49"E	80°32"E	80°20"30"E
River System	Seti/kamali	Mahakali	Chamiya/ Mahakali	Chamiya/ Mahakali	Mahakali
Water Source	Kalagad	Kukuregad	DadKhola	Dharigad Khola	Thaligad Khola
Type of Source		Perennial	Perennial	Perennial	Perennial
River Discharge (measured m3/s)		0.58 (Jan.)	0.082 (Apr.)	0.075 (Apr.)	0.456 (Apr.)
Catchment Area (km2)		6.05	3.9	2.86	36.75
Irrigation Capability	YR	MS	MS	MS	MS
Gross Area (ha)		131	124	350	140
Net Area (ha)	60	114	95	300	120
Altitude (m)		1,560	1,250	680	725
Main Canal (km)		2.51	3.49	8.0	3.6
Type of H/W		Trash Rack	Trench	Weir	Trash Rack
Household		250	86	75	230
Population		1,400	700	800	1,649
Cropping Intensity (%)	200	200	185	150	230
Total Cost (Rs.)		4,337,000	3,107,500	8,003,000	5,136,000
Unit Cost (Rs/ha)		38,000	32,700	26,700	42,800
IRR (%)			11.2	12.8	16.9
Study Year	1988	1982	1986	1987	1988
Source of Data	MPID2.R	F/S.R	F/S.R	F/S.R	F/S.R

Table 3.3.3 PRESENT SITUATION OF MPID2 IDENTIFIED SMALL PROJECTS (In the Study Area)

District	Number of Projects	Existing or on-going	Planned
Salyan	1	1	
Rukum	5	2	3
Surkhet	4	2	2
Jajarkot	4	2	2
Dailekh	1	1	
Total for Hill	15	8	7
Dolpa	2		2
Jumla	2	1	1
Kalikot	2		2
Mugu	2	2	
Humla	2	1	1
Total for Mount.	10	4	6
Total for Mid West.	25	12	13
Achham	1	1	
Doti	9	6	3
Dadeldhura	4	3	1
Baitadi	5	4	1
Total for Hill	19	14	5
Bajura	3	2	1
Bajhang	16	13	3
Darchula	4	3	1
Total for Mount.	23	18	5
Total for Far West.	42	32	10
Total for Mid+Far West.	67 (100%)	44 (66%)	23 (34%)

Table 3.3.4 **PRESENT SITUATION OF SECOND HILL IRRIGATION PROJECTS (SHIP) IN THE STUDY AREA**

District	Existing		On-Going		Planned		Total	
	NOS.	NCA(ha)	NOS.	NCA(ha)	NOS	NCA(ha)	NOS.	NCA(ha)
Achham	0	0	2	391	5	480	7	871
Doti	3	133	4	470	0	0	7	603
Bajura	1	50	2	130	0	0	3	180
Bajhang	6	598	5	617	3	200	14	1,415
Total	10	781	13	1,608	8	680	31	3,069

Table 3.3.5 FARMER AND AGENCY MANAGED IRRIGATION SYSTEMS

District	Number of Irrigation Systems			Net Command Area of System-wise (ha)				
	FMIS	AMIS	total	FMIS	AMIS	total	YR	S
Mid Western-Hill Ecological Belt								
1. Salyan	289	0	289	4,256	0	4,256	229	60
2. Rukum	74	29	103	869	1,595	2,464	99	4
3. Surkhet	291	0	291	12,364	0	12,364	140	151
4. Jajarkot	121	11	132	2,131	1,093	3,224	24	108
5. Dailekh	206	25	231	2,413	708	3,120	53	178
Total	981	65	1,046	22,032	3,395	25,427	545	501
Far Western-Hill Ecological Belt								
1. Achham	204	14	218	2,518	113	2,631	142	76
2. Doti	203	0	203	3,121	0	3,121	67	136
3. Dadeldhura	157	0	157	943	0	943	122	35
4. Baitadi		N .A			N. A		N.A	
Total	564	14	578	6,582	113	6,695	331	247
Total for Mid and Far	1,545	79	1,624	28,614	3,508	32,122	876	748

Note

FMIS : Farmer Managed Irrigation Systems
AMIS : Agency Managed Irrigation Systems (before sponsored by DOI, DIO, DDC, FAO etc)
YR : Year round, S : Seasonal, N. A : Not Available.

Source : ISSP Office
(Irrigation Sector Support Project Office)

Table 3.3.6 SUMMARY OF PRESENT DOI (Including SHIP), FMIS AND AMIS IRRIGATION PROJECTS IN STUDY AREA

	Total		Existing		On-Going		Planned		Cancelled	
District	Nos	NCA(ha)	Nos	NCA(ha)	Nos	NCA(ha)	Nos	NCA(ha)	Nos	NCA(ha)
Salyan	301	4,811	298	4,646	3	165				
Rukum	116	3,289	109	2,914	4	N.A.	3	375		
Surkhet	300	17,678	294	12,981	2	1,672	4	3,025		
Jajarkot	145	4,414	132	3,232	6	617	7	565		
Dailekh	234	3,653	232	3,150	1	477	1	26		
Total for Hill	1,096	33,845	1,065	26,923	16	2,931	15	3,991		
Dolpa	12	595	5	460			7	135		
Jumla	19	375	4	100	2	40	13	235		
Kalikot	11	1,168					10	953	1	215
Mugu	5	416	1	20	2	195	2	201		
Humla	6	520	2	65			3	385	1	70
Total for Mount.	53	3,074	12	645	4	235	35	1,909	2	285
Total for Mid West.	1,149	36,919	1,077	27,568	20	3,166	50	5,900	2	285
Achham	229	3,367	219	2,645	5	242	5	480		
Doti	236	4,676	220	3,610	7	625	6	179	3	262
Dadeldhura	162	1,511	157	943	4	398	1	170		
Baitadi	13	628	6	286	6	277	1	65		
Total for Hill	640	10,182	602	7,484	22	1,542	13	894	3	262
Bajura	8	647	1	50	5	382	2	215		
Bajhang	28	2,195	7	658	8	747	12	730	1	60
Darchula	12	1,034	1	40	8	559	3	435		
Total for Mount.	48	3,876	9	748	21	1,688	17	1,380	1	60
Total for Far West.	688	14,058	611	8,232	43	3,230	30	2,274	4	322
Total for Mid+Far West.	1,837	50,977	1,688	35,800	63	6,396	80	8,174	6	607

Table 3.4.1 VALLEY CULTIVATION POTENTIAL AREA AND PRESENT IRRIGATION AREA IN STUDY AREA

District	Polulation	District Area (km^2)	Potential Irrigation Area			Presint Irrigation Area		
			HV (ha)	HS (hs)	Total	Existing On-going Cancelled	Planned	Total
Humla	76,305	2,531	4,526	239	4,765	140	235	375
Jumla	34,640	5,655	1,601	133	1,734	135	385	520
Dolpa	25,075	7,889	868		868	460	135	595
Mugfu	36,445	3,535	764	1,267	2,031	215	201	416
Kalikot	88,781	1,741	661	2,423	3,084	215	953	1,168
Total	261,246	21,351	8,420	4,062	12,482	1,165	1,909	3,074
Surkhet	225,296	2,451	18,165	1,110	19,275	14,653	3,025	17,678
Salyan	182,145	1,462	3,790	1,492	5,282	4,811		4,811
Dailekh	187,820	1,502	2,540	4,536	7,076	3,627	26	3,653
Jajarkot	114,267	2,230	1,975	2,168	4,143	3,849	565	4,414
Rukum	155,017	2,877	3,491	678	4,169	2,914	375	3,289
Total	864,545	10,522	29,961	9,984	39,945	29,854	3,991	33,845
Doti	167,469	2,025	5,710	4,757	10,467	4,497	179	4,676
Dadeldhura	104,449	1,538	4,983	2,283	7,266	1,341	170	1,511
Accham	197,888	1,680	3,725	7,246	10,971	2,887	480	3,367
Total	469,806	5,243	14,418	14,286	28,704	8,725	829	9,554
Baitadi	220,229	1,519	2,796	4,653	7,449	563	65	628
Darchula	101,614	2,322	1,943	2,296	4,239	599	435	1,034
Bajang	139,178	3,422	5,026	2,523	7,549	1,465	730	2,195
Bajura	92,083	2,188	2,229	1,355	3,584	432	215	647
Total	553,104	9,451	11,994	10,827	22,821	3,059	1,445	4,504

* Source : MPID2 Table A2-3
HV: Hill Valleys, HS:HIll Slope

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABAI IRRIGATION SCHEME (1/6)

<1> Water Requirents

<1>-1 Irrigation Water Requiremnts : (Unit : Mm3/1,000 ha.)

Cropping Pattern	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
(1) No.4-TW/MS	0.75	0.90	1.41	0.61	0.00	1.20	1.87	1.78	2.38	3.53	2.41	1.00	17.83
(2) No.5-TW/YR/C	1.70	2.07	3.40	1.71	0.49	1.31	1.74	1.65	2.32	3.46	2.36	1.46	23.67

<1>-2 Irrigation Water Requiremnts : (Unit : m3/s/1,000 ha.)

Cropping Pattern	JAM.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
(1) No.4-TW/MS	0.28	0.37	0.53	0.23	0.00	0.46	0.70	0.66	0.92	1.32	0.93	0.37	6.78
(2) No.5-TW/YR/C	0.63	0.86	1.27	0.66	0.18	0.51	0.65	0.62	0.90	1.29	0.91	0.55	9.02

Note

(1) NO. 4 - TW/MS : Cropping Pattern Number 4 (Terai), TW : Terai West, MS : Monsoon Season
(2) NO. 5 - TW/UR/C : Cropping Pattern Number 5 (Terai), TW : Terai West, YR/C : Year Round - current
* source : MPID2, Annexes - Vol. 3 (Table D2 - 3)

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABAI IRRIGATION SCHEME (2/6)

<2> Available Water Discharge Under MPID Studies

<2> - 1, 90% reliable Stream Flow of Babai River (return period of 1/10 years)

(Unit: m3/s)

JAN.	DEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
11.9	9.6	7.9	6.3	9.6	35.0	139.4	151.6	145.8	59.6	22.7	14.3	613.6

<2> - 2, Available Water Discharge : (<2>-1) + (Diverted Water Discharge from Bheri River)

(Unit: m3/s)

Bheri + (<2> - 1)		JAN.	DEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
35	+ Babai	47	45	43	41	45	70	174	187	181	95	58	49	1,034
40	+ Babai	52	50	48	46	50	75	179	192	186	100	63	54	1,094
45	+ Babai	57	55	53	51	55	80	184	197	191	105	68	59	1,154
50	+ Babai	62	60	58	56	60	85	189	202	196	110	73	64	1,214
55	+ Babai	67	65	63	61	65	90	194	207	201	115	78	69	1,274
60	+ Babai	72	70	68	66	70	95	199	212	206	120	83	74	1,334

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABAI IRRIGATION SCHEME (3/6)

Reliably Irrigable Area Under MPID Studies

(1) Cropping Pattern : Case No. 4 - TW/MS (Unit: 1,000 ha.)

		JAN.	FEB.	MAR	APR.	MAY	JUN.	JUL	AUG.	SEP	OCT.	NOV.	DEC.	Total
Bheri														
35	+ Babai	167	121	81	177	0	151	250	281	197	72	62	132	1,691
40	+ Babai	185	134	91	198	0	162	257	288	202	76	67	145	1,806
45	+ Babai	203	148	100	220	0	173	264	296	208	79	73	159	1,922
50	+ Babai	221	161	110	241	0	184	271	304	213	83	78	172	2,038
55	+ Babai	238	175	119	262	0	194	279	311	219	87	84	185	2,153
60	+ Babai	256	188	129	284	0	205	286	319	224	91	89	199	2,269

(2) Cropping Pattern : Case No. 5 - TW/YR/C (Unit: 1,000 ha.)

		JAN.	FEB.	MAR	APR.	MAY	JUN.	JUL	AUG.	SEP	OCT.	NOV.	DEC.	Total
Bheri														
35	+ Babai	74	52	*34	63	244	138	269	303	202	73	63	90	1,605
40	+ Babai	82	58	38	70	271	148	277	311	207	77	69	99	1,707
45	+ Babai	90	64	42	78	298	158	285	319	213	81	74	109	1,810
50	+ Babai	98	70	46	85	326	168	292	327	219	85	80	118	1,912
55	+ Babai	106	75	50	93	353	178	300	335	224	89	85	127	2,014
60	+ Babai	113	81	**54	100	380	188	308	343	230	93	91	136	2,117

* 33,821 = 34 ha used in the MPID1, ** 53,533 = 54 ha (Used in the MPID 2)

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABAI IRRIGATION SCHEME (4/6)

Calculation of Reliably Irrigable Area Under this Study

Discharge Data of <Diversion + No.290>

(Unit : m3/s)

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1967	41	24	21	32	47	71	250	158	209	106	80	76
1968												
1969	61	40	35	55	71	79	147	471	215	119	85	70
1970	56	40	32	39	50	127	450	228	197	176	92	82
1971	60	35	53	95	122	165	197	324	240	165	112	88
1972	68	72	53	57	66	82	186	150	519	134	91	79
1973	91	71	76	67	69	222	297	304	308	251	99	82
1974	77	63	44	55	67	98	206	352	182	98	86	76
1975												
1976												
1977	28	20	10	17	47	97	334	507	181	114	84	60
1978	44	51	45	67	67	176	718	410	304	172	113	81
1979	58	57	40	53	90	78	398	280	196	95	76	70
1980	50	33	38	51	70	94	147	185	420	115	87	74
1981	56	41	37	63	74	136	269	390	548	172	116	76
1982	65	56	86	70	77	95	109	264	356	107	89	72
1983	61	41	30	37	73	69	128	188	590	377	112	75
1984	61	39	29	23	64	132	695	316	563	119	98	90
1985	70	46	36	47	78	148	271	494	345	277	110	96
1986	79	71	54	69	78	121	217	370	173	139	90	88
Ave.	60	47	42	53	71	117	295	317	326	161	95	79
Max.	91	72	86	95	122	222	718	507	590	377	116	96
Min.	28	20	10	17	47	69	109	150	173	95	76	60

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABAI IRRIGATION SCHEME (5/6)

Reliably Irrigable Area Under this study [Cropping Pattern : MS]

(Unit : 1,000 ha)

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1967	115	64	39	138	0	154	358	238	228	81	86	204
1968												
1969	217	107	66	233	0	171	210	709	234	90	91	188
1970	201	107	61	166	0	275	645	343	215	134	99	219
1971	213	93	100	408	0	355	282	488	261	125	120	236
1972	240	195	101	243	0	176	266	226	565	102	98	212
1973	323	191	143	289	0	480	425	457	336	190	106	220
1974	272	171	82	236	0	211	295	530	199	74	92	203
1975												
1976												
1977	100	53	***18**	72	0	209	479	764	197	87	90	162
1978	156	138	86	287	0	381	1,028	618	332	131	122	218
1979	205	154	75	226	0	169	570	422	214	****72**	82	186
1980	179	89	72	219	0	203	211	279	458	87	93	198
1981	201	109	70	269	0	294	386	587	597	131	124	202
1982	232	152	163	301	0	206	156	398	388	81	96	192
1983	217	112	57	160	0	150	183	283	643	286	121	200
1984	218	105	55	98	0	286	995	475	614	91	106	242
1985	249	123	68	203	0	320	388	744	346	210	119	256
1986	282	192	103	296	0	260	311	558	189	105	97	235
Ave.	215	127	80	226	0	253	423	478	356	122	102	210
Max.	323	195	163	408	0	480	1,028	764	643	286	124	256
Min.	100	53	18	72	0	150	156	226	189	72	82	162

* 18.184 ha = 18 x 10 3 ha ** 72,122 ha = 10 3 ha

Table 4.1.1 WATER BALANCE STUDIES FOR BHERI-BABA IRRIGATION SCHEME (6/6)

Reliably Irrigable Area Under this study [Cropping Pattern : YR]

(Unit: 1,000 ha.)

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1967	64	28	16	49	258	141	385	257	234	82	88	140
1968												
1969	96	46	28	83	388	157	227	764	240	92	93	128
1970	89	46	25	59	274	251	695	370	220	136	101	150
1971	94	40	42	144	667	325	304	526	268	127	123	161
1972	106	84	42	86	361	161	287	244	579	104	100	145
1973	143	83	60	102	379	439	458	493	344	194	108	151
1974	121	74	34	84	365	193	318	571	204	76	94	139
1975												
1976												
1977	44	23	8	25	258	191	516	823	202	88	92	111
1978	69	60	36	101	367	348	1108	656	340	133	125	149
1979	91	66	31	80	491	155	614	455	219	*74	83	127
1980	79	38	30	77	382	185	227	300	499	89	95	135
1981	89	47	29	95	402	269	415	633	612	133	127	138
1982	103	66	68	107	420	188	168	429	398	83	98	132
1983	96	48	24	57	398	137	197	305	659	292	123	137
1984	97	45	23	35	347	262	1072	512	629	92	108	165
1985	110	53	28	72	427	292	418	802	385	214	121	175
1986	125	83	43	105	425	238	335	601	193	108	99	161
Ave.	95	55	**33	80	389	231	455	515	364	125	105	144
Max.	143	84	68	144	667	439	1108	823	659	292	127	175
Min.	44	23	8	25	258	137	168	244	193	74	83	111

* 73,561 ha = 74 x 10 3 ha ** 33,278 ha = 33 x 10 3ha

Table 4.1.2 DISCHARGE DATA FOR BHERI-BABAI IRRIGATION SCHEME

<AT DIVERSION> (UNIT : M3/S)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1967	26.9	13	12.9	26.3	41.8	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1968												
1969	45.9	27.9	25.2	46	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1970	45.9	30	24.7	33.6	44.8	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1971	41.2	19.5	34.7	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1972	45.8	46.7	38.6	47.8	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1973	58.2	48.1	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1974	58.2	48.4	31.9	45.4	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1975												
1976												
1977	14.4	8	1.6	9.4	31	58.2	58.2	58.2	58.2	58.2	58.2	41.5
1978	27.4	32.2	32	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1979	39.7	39.4	28.4	46	58.2	58.2	58.2	58.2	58.2	58.2	58.2	45.8
1980	30	19.1	26.2	41.5	58.2	58.2	58.2	58.2	58.2	58.2	58.2	56.3
1981	41.7	27.8	26.8	52.1	58.2	58.2	58.2	58.2	58.2	58.2	58.2	49.7
1982	44.1	35.5	48.7	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	52.3
1983	43.9	27.3	20.5	28.5	58.2	58.2	58.2	58.2	58.2	58.2	58.2	42.1
1984	25.2	18.5	15.3	12.8	52.8	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1985	45.5	26.9	19.7	33.1	53.1	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1986	58.2	52.5	40.7	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
AVERAGE	**40.7**	**30.6**	**28.6**	**42.0**	**54.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**54.6**
MAXIMUM	**58.2**	**52.5**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**
MINIMUM	**14.4**	**8.0**	**1.6**	**9.4**	**31.0**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**58.2**	**41.5**

<AT STATION NO.290 : BARGDHA> (UNIT : M3/S)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1967	13.7	10.8	7.9	6	5.4	13	191.5	100	151	48.1	21.6	18.1
1968	17.7	12.9	8.2	7.2	6.1	58.5	107	191.4	142.8	62.7	24.4	17.5
1969	15	11.9	9.8	8.5	12.7	21.1	88.6	413	156.9	60.9	26.7	11.9
1970	10.4	9.6	7.4	5.2	5.4	68.9	391.9	169.9	138.8	118	33.8	23.5
1971	18.6	15.1	18.2	37	63.8	106.3	138.5	265.9	181.5	106.3	53.6	29.9
1972	21.7	25.5	14.5	8.9	7.9	23.4	127.7	91.9	460.8	75.7	32.8	21.1
1973	32.6	22.8	17.5	9.2	11.2	164.1	238.3	245.4	249.9	192.4	40.3	24.1
1974	18.3	14.9	11.6	9.7	8.6	39.3	147.8	294	124.2	39.8	27.7	17.8
1975												
1976												
1977	13.7	11.6	8	7.4	16.2	38.6	276	449.1	122.4	56	25.3	18.9
1978	16.3	19	13.2	8.7	9	118	659.4	352.1	246.1	113.8	55.1	23.2
1979	17.8	17.5	11.2	6.7	31.7	20.2	339.3	222.2	137.9	36.8	17.7	23.7
1980	20.2	13.7	11.9	9.5	11.7	35.6	89	126.9	361.9	56.6	28.3	17.7
1981	14.6	12.7	10.3	10.8	15.4	77.9	210.9	332	489.8	113.7	57.4	25.8
1982	21	20.8	37.2	12.1	18.7	37	50.4	206.2	298	49.1	30.6	19.6
1983	17	14	9.4	8.8	14.7	11.2	69.3	129.9	532.2	318.7	53.8	32.7
1984	36.1	20.3	13.6	10.1	10.7	74.2	636.4	257.4	505.1	61.1	40	32.1
1985	24.3	18.7	16.2	14.2	25	89.8	212.3	436.1	286.5	218.3	52.1	37.6
1986	20.9	18.5	13.5	11	19.6	62.4	159.1	312.1	114.9	80.7	32.2	29.7
AVERAGE	**19.4**	**16.1**	**13.3**	**10.6**	**16.3**	**58.9**	**229.6**	**255.3**	**261.2**	**100.5**	**36.3**	**23.6**
MAXIMUM	**36.1**	**25.5**	**37.2**	**37.0**	**63.8**	**164.1**	**659.4**	**449.1**	**532.2**	**318.7**	**57.4**	**37.6**
MINIMUM	**10.4**	**9.6**	**7.4**	**5.2**	**5.4**	**11.2**	**50.4**	**91.9**	**114.9**	**36.8**	**17.7**	**11.9**

Table 5.2.1 SUMMARY OF PLANNED PROJECTS (1/3)
(MID WESTERN DEVELOPMENT REGION -1/2-)

Distriet	Implementing Agency	Name	Net Command Area (ha) overall	Existing	New	Remarks
Rukum	DIO	Ghatte Khola	59	1	58	110401
	DIO	Majoo Khola	42	0	42	110402
	DIO	Rukumkot	275	0	275	110403
Surkhet	DIO	Babiyachaur	325	125	200	110501
	Regianal level					F/S Report
	(Assumed)	Surkhet Valley	2,700	0	2,700	by DOI
Jajarkot	DIO	Nepgad(Nalgad)	48(55)	(17)	(38)	110601
	DIO	Jukot	n.a			110603
	DIO(Assumed)	Pumma	112			from DIO
	DIO(Assumed)	Paink Gintala	120			from DIO
	DIO(Assumed)	Paink Aaukiya	100			from DIO
	DIO(Assumed)	Dhime	95			from DIO
	DIO(Assumed)	Pain Panikhet	90			from DIO
Dailekh	DIO(Assumed)	Mafuwa	26			from DIO
Dolpa	DIO	Chaila	110	0	110	120101
						Intermation
	DIO(Assumed)	Mukut	n.a			from DIO
	DIO(Assumed)	Mijer	n.a			from DIO
	DIO(Assumed)	Simushaldang	n.a			from DIO
	DIO(Assumed)	Komashagaun	25			from DIO
	DIO(Assumed)	Guphatar	n.a			from DIO
	DIO(Assumed)	Hulhara	n.a			from DIO
Jumuha	DIO	Garyangkot	200	0	200	120201
		Bhondariwadi	n.a			
		Malakotor Malpani	n.a			
		Dhupijyula	n.a			
		Gajyangkot	15			
		Kashikakot Sinewaja	n.a			
		Ghodemahadey Tuigou	20			
		Lohapi Gau	n.a			
		Tali V.P. Kanchaur	n.a			
		Mahatgau V.	n.a			

Table 5.2.1 SUMMARY OF PLANNED PROJECTS (2/3)
(MID WESTERN DEVELOPMENT REGION -2/2-)

Distriet	Implementing Agency	Name	NCA (ha)			Remarks
			overall	Existing	New	
Jumula	DIO	Sani V.	n.a			
		Baskot V.	n.a			
		Malcpatal Khola	n.a			
		Khola Gau	n.a			
						Jubitha I/P
Kalikot	DIO	Khanlagad Khola	100	0	100	120302
		Jhayangard	75			
		Kuni	70			
		Ukhadi	300			
		Bharta	156			
		Naulhan	140			
		Raku	8			
		Podecha	14			
		Suvatiya	30			
		Lalu	60			
Mugu	DIO	Natharpur	60	0	60	120401
		Dhilamaghatta	141	0	141	120402
Humuha	DIO	Masspur	300			
		Shreenagar	65			
		Kharpu	20			

Table 5.2.1 SUMMARY OF PLANNED PROJECTS (3/3)
(MID WESTERN DEVELOPMENT REGION -1/1-)

District	Implementing Agency	Name	NCA (ha)			Remarks
			overall	Existing	New	
Achham	SHIP	Chandika	75			
	SHIP	Khaptad	140			
	SHIP	Vardadevi	65			
	SHIP	Sutar	140			
	SHIP	Mujagaon	60			
Doti	DIO	Dang	n.a			
	DIO	Cirichoura	40			
	DIO	Land Kedaresuvor	55			
	DIO	Toleri	50			
	DIO	Lamikhel	25			
	DIO	Kalikasthan	9			
Dadeldhura	DIO	Doti Khola	170	0	170	140303
Batitadi	DIO	Kakan-Melghot	65			140405
Bajhang	DIO	Baweli	100			
	DIO	Jimkot	25			
	DIO	Panalt	40			
	DIO	Bhatgaon Chaur	80			
	DIO	Dafru	60			
	DIO	Rilu	25			
	DIO	Dipili	50			
	SHIP	Pujarikot	41	20	21	150206
	SHIP	Biskhet	89			208
	SHIP	Khaira	70			209
	SHIP	Paringal	100	20	80	214
	SHIP	Regan	50	25	25	215
Bajura	SHIP	Martodi	65	45	20	150103
	SHIP	Barbise	150			
Darchula	DIO	Dharigad	300	0	300	150303
		Sipti	95			

Table 5.2.2 SUMMARY OF POTENTIAL SCHEEMES <MID, FAR WESTERN DEVELOPMENT REGION>

No.	District	Implementing Agency	Project Name	N.C.A. (ha.) Overall	Existing	New
1	Rukum	DIO	Ghatte Khola	58	0	58
2	Rukum	DIO	Majon Khola	42	0	42
3	Rukum	DIO	Rukum Kot	275	0	275
4	Surkhet	DIO	Babiyachaur	325	125	200
5	Surkhet	DIO	Surkhet Valley	2700	0	2700
6	Surkhet	DIO	Lift Irrigation (Korelli Khola)	316		
7	Jajarkot	DIO	Nepgad (Nelgad)	40(55)	(17)	(38)
8	Dalpa	DIO	Chaila	110	0	110
9	Jumla	DIO	Garyang Kot	200	0	200
10	Mugu	DIO	Natharpur	60	0	60
11	Mugu	DIO	Dhilamaghatta	141	0	141
12	Dadeldhura	DIO	Doti Khola	170	0	170
13	Baitadi	DIO	Kankai-Melghat	65		
14	Darchula	DIO	Dharigad	300	0	300

Table 5.2.3 INVENTORY OF THE POTENTIAL SCHEMES (1/3)

Scheme No. Scheme Name	[Unit]	(1) Gatte Khola	(2) Majaoo Khola	(3) Rukumkot	(4) Babiyachaur	(5) Surkhet Valley
-District		Rukum	Rukum	Rukum	Surkhet	Surkhet
-Water Source		Ghatte Khola Nathigad	Bagmare Khola Kain Khola	Ghatte Khola	Khamare Khola	Chingar Khola
-Type of Source			Perennial			Perennial
-River Discharge	m3/s	Ghatte 0.01(Feb.)	0.01 (Apr.)		0.03 (Mar.)	1.26 (Jun.'89)
	m3/s	Nathi 0.11 (Jan.)	0.01 (Apr.)	0.1	0.08 (Mar.)	
-Catchment Area	km2	17.67	1.43		0.47	153
-Irrigation Availability		YR	YR		MS	YR
-Gross Area	ha	102	71.3		350	3,000
-Net Area	ha	58	41.5	275	325	2,700
-Altitude	m	1,050	1,300		420	750
-Main Canal	km	2.7	3.6		7.1	40.0
-Household		241	78		780	
-Population		4,404	780		5,000	35,000
-Accessibility						
>Nearest town		32km from Dang Tulsipur Chourjari	75km from Dang Tulsipur Chourjari	10 days walk from Chinchu or Tulispur Chourjari	2 days walk from Birendranagar	Birendranagar
>Nearest stall					Birendranagar	Birendranagar
-Total Cost	million Rs.	3.4	1.8	9.5	23.4	313.1
-Unit Cost	10^3Rs/ha	59	44	64	72	115
-IRR	%				18.5 (EIRR)	8.7

Table 5.2.3 INVENTORY OF THE POTENTIAL SCHEMES (2/3)

Scheme No. Scheme Name	[Unit]	(6) Korelli Khola Basin Irrigation	(7) Nalgad	(8) Chaila	(9) Garjyangkot	(10) Natharpur
-District		Surkhet	Jajarkot	Jajarkot	Jumla	Mugu
-Water Source		Bheri River	Nalgad	Ghungharu	Talpunera Khola	Humla Karnali
-Type of Source		Perennial	Perennial		Perennial	
-River Discharge	m3/s		23 (Apr.)		0.77 (Aswin)	
	m3/s					
-Catchment Area	km2		675		15.75	
-Irrigation Availability		YR	YR	YR	YR	YR
-Gross Area	ha	-----	86		240	
-Net Area	ha	316	48	110	200	60
-Altitude	m	480	1,000		2,550	
-Main Canal	km	pump up	5.07		5.6	4.7
-Household			112		216	
-Population			1,000		1,500	
-Accessibility		3.5km from Chinchu				
>Nearest town			30km from Chourjari	n.a.	2 hours walk from Jumla Airport	2 days walk from Kalti Airport
>Nearest stall			Chourjari	n.a.	Jumla	Kalti
-Total Cost	million Rs.		3.0		10.6	39.0
-Unit Cost	10^3Rs/ha		63		53	650
-IRR	%				16.6	

Table 5.2.3 INVENTORY OF THE POTENTIAL SCHEMES (3/3)

Scheme No. Scheme Name	[Unit]	(11) Dhilamghatta	(12) Doti Khola	(13) Kakari-Melghat	(14) Dharigad
-District		Mugu	Dadeldhura	Baitadi	Darchula
-Water Source		Kaligad	Doti Khola	Surnayagad	Dharigad Khola
-Type of Source		Perennial		Perennial	Perennial
-River Discharge	m3/s m3/s	0.29 (Apr.)	0.24	1.74 (May)	0.075 (Apr.)
-Catchment Area	km2	18	30	416	2.86
-Irrigation Availability		MS			MS
-Gross Area	ha	156			350
-Net Area	ha	141	170	65.5	300
-Altitude	m	2,100	1,500	650	680
-Main Canal	km	4.92		8.5	8.0
-Household		307	103	250	75
-Population		1,600	450	1,750	800
-Accessibility					
>Nearest town	64 km from Airport	2 dyas walk from Kalti Airport	8 hours walk from Dadeldhula	40 km from Airport	60 km from Baitadi
>Nearest stall	Jamla	Kalti	Dadeldhula	Patan	Baitadi
-Total Cost	million Rs.	11.9	18.0	8.3	8.0
-Unit Cost	10^3Rs/ha	84	105	127	26
-IRR	%	14.7		12.1	12.8

Table 7.1.1 CROPPING PATTERN FOR BABAI IRRIGATION PROJECT (STAGE I)

BASIC ASSUMPTIONS

FOR PADDY :	LAND PREPERATION 150MM (NET OF EVAPORATION AND ON-FARM LOSTS) NERSERY 40MM ; PERCOLATION 2MM/DAY
FOR UPLAND CROPS :	60MM PRE-IRRIGATION
DESIGN RAINFALL :	80% PROBABILITY OF MONTHLY RAINFALL EXCEEDANCES
FIELD EFFICIENCY :	UPLAND AREA : 70% LOWLAND AREA : 80%
TERTIARY CANAL EFFICEICY :	85%
RIVER FLOW RECORDS :	1967~1981

CROPS	PLANTING PERIOD		NET AREA PLANTED (%)	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
A. FARM WATER REQUIREMENTS																											
1 HYV PADDY	JUN	1~15	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	128.0	122.0	30.0	29.0	24.0	42.0	57.0	71.0	0.0	0.0	0.0	0.0	0.0
2 HYV PADDY	JUN	16~30	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	90.0	102.0	31.0	24.0	42.0	59.0	77.0	79.0	0.0	0.0	0.0	0.0
3 LOC.PADDY	JUL	16~31	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	90.0	102.0	31.0	24.0	42.0	59.0	77.0	85.0	73.0	65.0	0.0	0.0
4 LOC.PADDY	AUG	1~15	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.0	103.0	24.0	42.0	59.0	79.0	87.0	77.0	65.0	62.0	0.0
5 MAIZE	MAY	16~31	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.0	37.0	30.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 COTTON	MAY	1~15	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	84.0	37.0	18.0	1.0	0.0	0.0	0.0	10.0	24.0	39.0	39.0	29.0	0.0	0.0	0.0
7 VEGETABLES	JUN	16~30	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.0	0.0	0.0	0.0	0.0	4.0	21.0	38.0	0.0	0.0	0.0	0.0	0.0
8 GROUNDNUTS	JUN	16~20	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0	0.0	0.0	0.0	10.0	27.0	47.0	0.0	0.0	0.0	0.0	0.0
9 WHEAT	NOV	16~30	30.0	36.0	36.0	36.0	33.0	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.0	22.0	34.0
10 OILSEEDS	OCT	16~31	19.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.0	31.0	39.0	36.0	34.0
11 PULSES	NOV	16~30	12.0	34.0	34.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.0	20.0	28.0
12 PULSES	DEC	1~15	12.0	34.0	34.0	31.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.0	24.0
13 VEGETABLES	NOV	16~30	2.0	27.0	29.0	29.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	12.0	17.0
B. GROSS REQUIREMENTS AT TERTIARY HEAD (MIL.M3)				5.01	4.31	3.99	2.73	1.59	0.00	0.00	0.00	0.50	2.68	2.81	9.21	14.31	11.15	5.91	3.69	6.71	9.66	12.73	11.46	4.39	11.45	6.60	5.11
C. REQUIRED FLOW AT HEADWORKS																											
80% CONVEYANCE EFFICIENCY (M3/S)				4.8	4.2	3.9	2.6	1.5	0.0	0.0	0.0	0.5	2.6	2.7	8.9	13.8	10.8	5.7	3.6	6.5	9.3	12.3	11.1	4.3	11.0	6.4	4.9
80% CONVEYANCE EFFICIENCY (M3/S/ha)				0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.7	1.0	0.8	0.4	0.3	0.5	0.7	0.9	0.8	0.3	0.8	0.5	0.4
AVERAGE (M3/S/ha)				0.4		0.3		0.1		0.0		0.2		0.5		0.9		0.4		0.6		0.9		0.6		0.5	
65% CONVEYANCE EFFICIENCY (M3/S)				5.9	5.1	4.7	3.2	1.9	0.0	0.0	0.0	0.6	3.2	3.3	10.9	17.0	13.2	7.0	4.4	8.0	11.5	15.1	13.6	5.2	13.6	7.6	6.1
65% CONVEYANCE EFFICIENCY (M3/S/ha)				0.5	0.4	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.3	1.0	0.5	0.3	0.6	0.9	1.1	1.0	0.4	1.0	0.6	1.0
AVERAGE (M3/S/ha)				0.5		0.3		0.1		0.0		0.0		0.2		1.2		0.4		0.8		1.1		0.7		0.8	
D. AVAILABLE SUPPLY																											
80% RELIABLE RIVER FLOW (M3/S)				15.0		12.0		8.0		7.0		4.7	5.2	6.6	18.6	96.0		156.0		143.0		49.0		24.0		17.0	
MEAN RIVER FLOW (M3/S)				18.8		16.0		12.1		10.8		12.0	19.1	34.6	100.0	209.4		240.3		223.9		90.0		34.0		21.9	
50% RELIABLE RIVER FLOW (M3/S)				17.0		15.0		12.0		9.0		9.3	11.4	17.4	54.8	148.0		245.0		182.0		76.0		31.0		22.0	

Table 7.1.2 PROPOSED CROPPING PATTERN FOR SIKTA IRRIGATION SCHEME

A.GROSS DIVERSION REQUIREMENT

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5	M3 x 10^5
1. RICE		-	-	-	-	-	-	881.47	328.37	569.35	613.20	478.90	-
2. WHEAT		218.94	321.92	321.92	231.75	-	-	-	-	69.61	49.95	-	193.15
3. MAIZE		-	-	-	-	-	-	-	-	-	72.11	73.66	56.92
4. MUSTARD		-	-	-	-	-	-	-	-	37.50	-	-	-
5. PULSES		-	-	-	-	-	-	-	-	-	-	-	-
6. POTATO		6.80	-	-	-	-	-	-	-	-	10.30	11.32	9.26
7. OTHERS		10.20	-	-	-	-	-	-	-	-	-	10.20	12.82
TOTAL	M3 x 10^5	235.94	321.92	321.92	231.75	0.00	0.00	881.47	328.37	676.46	745.56	574.08	272.15
REQUIRED DISCHARGE	M3/S	9.10	12.42	12.42	12.39	-	-	34.00	12.66	26.09	28.76	22.15	10.49
REQUIRED DISCHARGE	M3/S	0.50	0.69	0.69	0.69	-	-	1.11	0.41	0.85	0.94	0.72	0.34

B.CROPPING PATTERN

	CROPPING INTENSITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. RICE	0.85							RICE : 30,600 ha					
2. WHEAT	0.50	WHEAT : 18,035 ha											WHEAT
3. MAIZE	0.10								MAIZE : 3,607 ha				
4. MUSTARD	0.13	MUSTARD									MUSTARD : 4,689 ha		
5. PULSES	0.17						PULSES : 6,132 ha						
6. POTATO	0.02		POTATO								POTATO : 921 ha		
7. OTHERS	0.03	OTHERS										OTHERS : 1,082 ha	
PROJECT AREA	1.80	A=36,070 ha											

Table 7.1.3 COMPARISON LIST OF REQUIRED DISCHARGE IN THE BHERI-BABAI IRRIGATION SHEME

UNIT : M3/S/1000ha

CROPPING PATTERN MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.UNDER THIS STUDY (MPID 2)												
1) NO.4 - TW/MS	0.28	0.37	0.53	0.23	0.00	0.46	0.70	0.66	0.92	1.32	0.93	0.37
2) NO.5 - TW/YR/C	0.63	0.86	1.27	0.66	0.18	0.51	0.65	0.62	0.90	1.29	0.91	0.55
2.BABAI IRRIGATION PROJECT(STAGE I)												
65% CONVEYANCE EFFICIENCY AT HEAD WORKS	0.50	0.30	0.10	0.00	0.00	0.20	1.20	0.40	0.80	1.10	0.70	0.80
3.SIKTA IRRIGATION SCHEME	0.50	0.69	0.69	0.69	0.00	0.00	1.11	0.41	0.85	0.94	0.72	0.34

Table 7.1.4 BHERI-BABAI IRRIGATION SCHEME
AVERAGE GROUP BUDGETS AT ECONOMIC PRICES

Unit : NPS/ha

	Irrigated			Rainfed			
	Without Project	With Project	Incremental	Without Project	With Project	Incremental	Average of Incremental
Average for Kharif Crops							
Gross Return per ha of Net Area	10,255	31,531	21,276	6,884	31,531	24,647	22,961
Input Cost per ha of Net Area	5,830	8,682	2,852	3,473	8,682	5,209	4,031
Net Return per ha of Net Area	4,425	22,849	18,424	3,411	22,849	19,438	18,931
Cropping Intensity	98%	100%	2%	70%	100%	30%	
Average for Rabi Crops							
Gross Return per ha of Net Area	4,675	17,942	13,267	1,494	17,942	16,448	14,858
Input Cost per ha of Net Area	1,765	4,410	2,645	554	4,410	3,856	3,251
Net Return per ha of Net Area	2,910	13,532	10,622	940	13,358	12,592	11,607
Cropping Intensity	44%	75%	31%	21%	75%	54%	
Average for All Crops							
Gross Return per ha of Net Area	14,930	49,473	34,543	8,378	49,473	41,095	37,818
Input Cost per ha of Net Area	7,595	13,092	5,497	4,027	13,092	9,065	7,281
Net Return per ha of Net Area	7,335	36,381	**29,046**	4,351	36,381	**32,030**	**30,537**
Cropping Intensity	142%	175%	33%	91%	175%	84%	

Table 7.1.5 BHERI-BABAI IRRIGATION SCHEME (IRRIGATED)
INDIVIDUAL CROP BUDGETS AT ECONOMIC PRICES

Unit : NPS/ha

Crops	Season	% of CCA	Yield (Ton)	Price (NPS/Ton)	Gross Return (a)	Seeds	Labour	Draft Animal	Fertilizers	Other Cost	Total Cost (b)	Net Return (a) - (b)
Without Project												
HYV Paddy	Kharif	9.0	2.00	9,660	19,320	600	3,159	2,362	1,534	195	7,850	11,470
Local Paddy	Kharif	73.0	1.20	8,117	9,740	600	2,943	2,227	447	90	6,307	3,433
Maize	Kharif	15.0	0.70	10,410	7,287	140	1,674	1,215	0	45	3,074	4,213
Vegetables	Kharif	1.0	7.00	4,480	31,360	200	2,619	1,485	1,306	240	5,850	25,510
Wheat	Rabi	14.0	1.10	14,110	15,521	800	2,322	2,565	447	130	6,264	9,257
Pulses	Rabi	19.0	0.60	12,660	7,596	450	810	742	0	0	2,002	5,594
Oilseeds	Rabi	10.0	0.50	14,910	7,455	180	1,404	1,485	447	0	3,516	3,939
Vegetables	Rabi	1.0	7.00	4,480	31,360	9,900	2,565	1,485	1,403	260	15,613	15,747
With Project												
HYV Paddy	Kharif	60.0	3.40	9,660	32,844	250	3,510	2,565	2,779	410	9,514	23,330
Local Paddy	Kharif	19.0	2.50	8,117	20,293	300	3,186	2,362	1,534	160	7,542	12,751
Maize	Kharif	8.0	2.10	10,410	21,861	175	2,052	1,417	1,306	110	5,060	16,801
Cotton	Kharif	5.0	1.70	42,000	71,400	300	3,645	1,957	3,261	580	9,743	61,657
Groundnuts	Kharif	5.0	1.50	12,050	18,075	1,440	2,295	1,890	1,866	130	7,621	10,454
Vegetables	Kharif	3.0	13.00	4,480	58,240	200	3,240	1,687	3,384	430	8,941	49,299
Wheat	Rabi	30.0	2.50	14,110	35,275	800	2,484	2,025	2,683	260	8,252	27,023
Pulses	Rabi	24.0	1.20	12,660	15,192	450	945	742	805	0	2,942	12,250
Oilseeds	Rabi	19.0	0.90	14,910	13,419	180	1,755	1,485	832	65	4,317	9,102
Vegetables	Rabi	2.0	13.00	4,480	58,240	11,700	3,240	1,890	3,165	430	20,425	37,815

<Note> Return Price : Used World Bank Economic Price except Cotton and Groundnuts
Cost Price : Used World Bank Price only for Fertilizers, Babai I/P Economic Price for others
Kharif : Monsoon Season
Rabi : Winter

Table 7.1.6 BHERI-BABAI IRRIGATION SCHEME (RAINFED)
INDIVIDUAL CROP BUDGETS AT ECONOMIC PRICES

Unit : NPS/ha

Crops	Season	% of CCA	Yield (Ton)	Price (NPS/Ton)	Gross Return (a)	Seeds	Labour	Draft Animal	Fertilizers	Other Cost	Total Cost (b)	Net Return (a) - (b)
Without Project												
Local Paddy	Kharif	51.0	1.10	8,117	8,929	600	2,835	2,025	0	0	5,460	3,469
Maize	Kharif	17.0	0.70	10,410	7,287	140	1,674	1,215	0	20	3,049	4,238
Maize	Kharif	2.0	1.30	42,000	54,600	300	3,510	1,822	2,718	200	8,550	46,050
Wheat	Rabi	3.0	0.90	14,110	12,699	800	2,106	1,755	0	60	4,721	7,978
Pulses	Rabi	11.0	0.50	12,660	6,330	450	783	742	0	0	1,976	4,354
Oilseeds	Rabi	7.0	0.40	14,910	5,964	180	1,269	1,350	0	0	2,799	3,165
With Project												
HYV Paddy	Kharif	60.0	3.40	9,660	32,844	250	3,510	2,565	2,779	410	9,514	23,330
Local Paddy	Kharif	19.0	2.50	8,117	20,293	300	3,186	2,362	1,534	160	7,542	12,751
Maize	Kharif	8.0	2.10	10,410	21,861	175	2,052	1,417	1,306	110	5,060	16,801
Cotton	Kharif	5.0	1.70	42,000	71,400	300	3,645	1,957	3,261	580	9,743	61,657
Groundnuts	Kharif	5.0	1.50	12,050	18,075	1,440	2,295	1,890	1,866	130	7,621	10,454
Vegetables	Kharif	3.0	13.00	4,480	58,240	200	3,240	1,687	3,384	430	8,941	49,299
Wheat	Rabi	30.0	2.50	14,110	35,275	800	2,484	2,025	2,683	260	8,252	27,023
Pulses	Rabi	24.0	1.20	12,660	15,192	450	945	742	805	0	2,942	12,250
Oilseeds	Rabi	19.0	0.90	14,910	13,419	180	1,755	1,485	832	65	4,317	9,102
Vegetables	Rabi	2.0	13.00	4,480	58,240	11,700	3,240	1,890	3,165	430	20,425	37,815

<Note> Return Price : Used World Bank Economic Price except Cotton and Groundnuts
Cost Price : Used World Bank Price only for Fertilizers, Babai I/P Economic Price for others
Kharif : Monsoon Season
Rabi : Winter

Table 7.1.7 BHERI-BABAI IRRIGATION SCHEME CROP YIELD AND INPUT DATA

Crops	Season	Yield Ton/ha	By-Prod Ton/ha	Seed kg/ha	Labour Manday/ha	Bullok Pairdays/ha	Nitrogen (N) kg/ha	Phoshorous (P) kg/ha	Potash (K) kg/ha
Crops without Project									
Paddy HYV	Wet-Irrigated	2.0	2.0	60.0	114.0	34.0	30	15	10
Paddy Local	Wet-Rainfed	1.1	2.2	60.0	104.0	30.0	0	0	0
Paddy Local	Wet-Irrigated	1.2	2.4	60.0	108.0	32.0	10	5	0
Maize	Wet-Rainfed	0.7	0.9	20.0	60.0	18.0	0	0	0
Maize	Wet-Irrigated	0.9	1.2	20.0	63.0	19.0	10	5	5
Vegetable	Wet-Irrigated	7.0	0.0	2.0	97.0	22.0	30	10	5
Wheat	Dry-Res.Mois.	0.9	0.9	100.0	78.0	26.0	0	0	0
Wheat	Dry-Irrigated	1.1	1.1	100.0	80.0	27.0	10	5	0
Pulses	Dry-Res.Mois.	0.5	0.5	25.0	29.0	11.0	0	0	0
Pulses	Dry-Irrigated	0.6	0.6	25.0	30.0	11.0	0	0	0
Oilseeds	Dry-Res.Mois.	0.4	0.0	9.0	47.0	20.0	0	0	0
Oilseeds	Dry-Irrigated	0.5	0.0	9.0	50.0	20.0	10	5	0
Vegetables(Potato)	Dry-Irrigated	7.0	0.0	1,100.0	95.0	22.0	30	10	10
Crops with Project									
Paddy HYV	Wet-Irrigated	3.4	3.4	25.0	130.0	38.0	55	25	20
Paddy Local	Wet-Irrigated	2.5	5.0	30.0	118.0	35.0	30	15	10
Maize	Wet-Irrigated	2.1	2.7	25.0	76.0	21.0	35	10	5
Cotton	Wet-Irrigated	1.7	0.0	20.0	135.0	29.0	60	30	30
Groundnuts	Wet-Irrigated	1.5	0.0	80.0	85.0	28.0	25	30	15
Vegetables	Wet-Irrigated	13.0	0.0	2.0	120.0	25.0	70	30	20
Wheat	Dry-Irrigated	2.5	2.5	100.0	92.0	30.0	55	25	15
Pulses	Dry-Irrigated	1.2	1.2	25.0	35.0	11.0	10	15	5
Oilseeds	Dry-Irrigated	0.9	0.0	9.0	65.0	22.0	15	10	5
Vegetables(Potato)	Dry-Irrigated	13.0	0.0	1,300.0	120.0	28.0	60	30	25

Source : Babai Irrigation Project Report (Oct, 1992)

Table 7.1.8 BHERI-BABAI IRRIGATION SCHEME
FINANCIAL AND ECONOMIC PRICES

Unit : NRS

	Financial Price	Economic Price	Remarks
Comodities (NRS/Ton)			
Paddy Local	8,117	8,117	World Bank Price with Using Babai I/P Rate
HYV Paddy	9,660	9,660	World Bank Price
Maize	6,000	10,410	World Bank Price
Wheat	6,000	14,110	World Bank Price
Pulses	14,000	12,660	World Bank Price
Oilseeds	16,250	14,910	World Bank Price
Cotton	36,000	42,000	Babai I/P Price
Vegetables	5,000	4,480	World Bank Price
Fertilizers (NRS/Kg)			
Nitrogen (N)	11.17	31.60	World Bank Price
Phosphorous (P)	16.67	26.22	World Bank Price
Potash (K)	14.17	19.31	World Bank Price
Labour (NRS/Day)	30.00	27.00	Babai I/P Price
Draft Animal (NRS/Day)	75.00	67.50	Babai I/P Price

<Note> Babai I/P Price (1992, Oct)
World Bank Price (Estimated making reference with the World Bank price forecast in 2000 at 1993 constant price)

Table 7.1.9 BHERI-BABAI IRRIGATION SCHEME ESTIMATED PROJECT COST AND ECONOMIC COST

(Unit : NPS 1,000)

	Stage I (13,500 ha)	Stage II 1~3 (5,500 ha)	Stage II (21,000 ha)	Sikta I/P (34,279 ha)
I. Project Cost				
1. Direct Cost	1,450,000	708,000	2,626,000	5,900,000
Civil Works	(1,150,000)	(561,000)	(1,925,000)	(4,700,000)
Price Contingencies (16.5% of Civil Works)	(190,000)	(93,000)	(445,000)	(780,000)
Physical Contingences	(110,000)	(54,000)	(256,000)	(420,000)
2. Indirect Cost (12 ~ 13% of Direct Cost)	184,000	88,000	340,000	760,000
3. Total Construction (1+2)	1,634,000	796,000	2,966,000	6,660,000
4. Recurrent Cost	16,000	6,000	20,000	47,000
5. Total Project Cost (3+4)	1,650,000	802,000	2,986,000	6,707,000
II. Economic Cost				
1. Capital Cost (85% of Total Construction Cost)				
Cost Disbursement 1st Year	138,890		252,110	285,047
2nd Year	347,225	68,170	630,275	570,095
3rd Year	416,670	204,150	756,330	855,142
4th Year	347,225	340,850	630,275	1,140,190
5th Year	138,890	68,170	252,110	1,140,190
6th Year				855,142
7th Year				570,095
8th Year				285,048
2. O/M Cost (3% of Direct Cost per Year)	43,500	21,240	78,780	177,000

Table 7. 1.10 BHERI-BABAI IRRIGATION SCHEME

CALCULATION OF CAPITAL COST, O/M COST AND BENEFIT

Unit : NRS. 1,000

Year	Capital Cost					O/M Cost					Benefit				
	Stage I	Stage II (1~3)	Stage II	Sikta	**Total**	Stage I	Stage II (1~3)	Stage II	Sikta	**Total**	Stage I (13,500ha)	Stage II (5,500ha)	Stage II (21,000ha)	Sikta (34,270ha)	**Total**
-5	138,890				138,890						17,520				17,520
-4	347,225	68,170			415,395						52,561	14,276			66,837
-3	416,670	204,150			620,820						105,123	42,828			147,951
-2	347,225	340,850			688,075						175,206	85,656			260,862
-1	138,890	68,170			207,060						350,412	142,760			493,172
0						43,500	21,240			64,740	350,412	142,760			493,172
1						43,500	21,240			64,740	350,412	142,760			493,172
2						43,500	21,240			64,740	350,412	142,760			493,172
3						43,500	21,240			64,740	350,412	142,760			493,172
4						43,500	21,240			64,740	350,412	142,760			493,172
5			252,100	285,047	537,147	43,500	21,240			64,740	350,412	142,760			493,172
6			630,275	570,095	1,200,370	43,500	21,240			64,740	350,412	142,760	27,254	44,476	564,902
7			756,330	855,142	1,611,472	43,500	21,240			64,740	350,412	142,760	81,762	133,429	708,363
8			630,275	1,140,190	1,770,465	43,500	21,240			64,740	350,412	142,760	163,525	266,858	923,555
9			252,110	1,140,190	1,392,300	43,500	21,240			64,740	350,412	142,760	272,542	444,763	1,210,477
10			0	855,142	855,142	43,500	21,240	78,780		143,520	350,412	142,760	545,085	622,668	1,660,925
11			0	570,095	570,095	43,500	21,240	78,780		143,520	350,412	142,760	545,085	800,574	1,838,831
12			0	285,048	285,048	43,500	21,240	78,780		143,520	350,412	142,760	545,085	889,527	1,927,784
13~50			0	0	0	43,500	21,240	78,780	177,000	320,520	350,412	142,760	545,085	889,527	1,927,784

<Note> Construction Schedule : Stage I (5 years), Stage II 1~3 (4 years), Stage II (5 years), Sikta (8 years)
Capital Cost : 85% of Total Construction Cost
O/M Cost : 3% of Direct Cost per Year

Table 7.1.11 **ECONOMIC INTERNAL RATE OF RETURN (EIRR) FOR BHERI-BABAI IRRIGATION SCHEME**

Unit : NRS. 1,000

Year	Capital Cost	O/M Cost	Benefit	(Benefit - Cost)
-5	138,890			-138,890
-4	415,395		17,520	-397,875
-3	620,820		66,837	-553,983
-2	688,075		147,951	-540,124
-1	207,060		260,862	53,802
0		64,740	493,172	428,432
1		64,740	493,172	428,432
2		64,740	493,172	428,432
3		64,740	493,172	428,432
4		64,740	493,172	428,432
5	537,147	64,740	493,172	-108,715
6	1,200,370	64,740	564,902	-700,208
7	1,611,472	64,740	708,363	-967,849
8	1,770,465	64,740	923,555	-911,650
9	1,392,300	64,740	1,210,477	-246,563
10	855,142	143,520	1,660,925	662,263
11	570,095	143,520	1,838,821	1,125,206
12	285,048	143,520	1,927,784	1,499,216
13		320,520	1,927,784	1,607,264
14		320,520	1,927,784	1,607,264
15		320,520	1,927,784	1,607,264
16		320,520	1,927,784	1,607,264
17		320,520	1,927,784	1,607,264
18		320,520	1,927,784	1,607,264
19		320,520	1,927,784	1,607,264
20		320,520	1,927,784	1,607,264
21		320,520	1,927,784	1,607,264
22		320,520	1,927,784	1,607,264
23		320,520	1,927,784	1,607,264
24		320,520	1,927,784	1,607,264
25		320,520	1,927,784	1,607,264
26		320,520	1,927,784	1,607,264
27		320,520	1,927,784	1,607,264
28		320,520	1,927,784	1,607,264
29		320,520	1,927,784	1,607,264
30		320,520	1,927,784	1,607,264
31		320,520	1,927,784	1,607,264
32		320,520	1,927,784	1,607,264
33		320,520	1,927,784	1,607,264
34		320,520	1,927,784	1,607,264
35		320,520	1,927,784	1,607,264
36		320,520	1,927,784	1,607,264
37		320,520	1,927,784	1,607,264
38		320,520	1,927,784	1,607,264
39		320,520	1,927,784	1,607,264
40		320,520	1,927,784	1,607,264
41		320,520	1,927,784	1,607,264
42		320,520	1,927,784	1,607,264
43		320,520	1,927,784	1,607,264
44		320,520	1,927,784	1,607,264
45		320,520	1,927,784	1,607,264
46		320,520	1,927,784	1,607,264
47		320,520	1,927,784	1,607,264
48		320,520	1,927,784	1,607,264
49		320,520	1,927,784	1,607,264
50		320,520	1,927,784	1,607,264

EIRR = 17.0751%

Table 7.2.1 WATER BALANCE CASE STUDY FOR SURKHET VALLEY

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Paddy (Area : 2,300 ha)														
Net Monthly Irrigation Requirement	(mm)							178.28	245.08	246.4	217.96			
	(l/s/ha)							0.67	0.92	0.95	0.81			
Intake Efficiency	(60%)							1.11	1.53	1.58	1.36			
A. Gross Water Requirement	**(l/s)**							**2,552**	**3,508**	**3,644**	**3,119**			
Summer Vegetable (Area : 1,000 ha)														
Net Monthly Irrigation Requirement	(mm)			20.07	124.17	90.65	13.22							
	(l/s/ha)			0.15	0.48	0.34	0.05							
Intake Efficiency	(60%)			0.26	0.80	0.56	0.09							
B. Gross Water Requirement	**(l/s)**			**258**	**798**	**564**	**85**							
Wheat (Area : 700 ha)														
Net Monthly Irrigation Requirement	(mm)	68.16	75.07	19.34								16.13	45.08	
	(l/s/ha)	0.25	0.31	0.15								0.12	0.17	
Intake Efficiency	(60%)	0.42	0.52	0.25								0.21	0.28	
C. Gross Water Requirement	**(l/s)**	**297**	**362**	**174**								**145**	**196**	
Potato (Area : 300 ha)														
Net Monthly Irrigation Requirement	(mm)	64.28	82.74	115.71								32.14	33.75	
	(l/s/ha)	0.24	0.34	0.43								0.12	0.13	
Intake Efficiency	(60%)	0.40	0.57	0.72								0.20	0.21	
D. Gross Water Requirement	**(l/s)**	**120**	**171**	**216**								**60**	**63**	
Mustard (Area : 200 ha)														
Net Monthly Irrigation Requirement	(mm)	37.69	72.94	48.29									10.54	
	(l/s/ha)	0.14	0.56	0.18									0.08	
Intake Efficiency	(60%)	0.23	0.94	0.30									0.14	
E. Gross Water Requirement	**(l/s)**	**47**	**188**	**60**									**27**	
Total Water Requirement(A+B+C+D+E)	**(m3/s)**	**0.46**	**0.72**	**0.71**	**0.80**	**0.56**	**0.09**	**2.55**	**3.51**	**3.64**	**3.12**	**0.21**	**0.29**	**16.65**
Water Discharge of Chingar Khola	**(m3/s)**	**2.10**	**1.17**	**0.99**	**1.98**	**1.98**	**1.76**	**2.98**	**5.86**	**4.62**	**3.05**	**2.75**	**2.92**	**32.15**

Table 7.2.2 **SURKHET VALLEY IRRIGATION SCHEME**
INCREMENTAL GROSS MARGIN AT ECONOMIC PRICES

Crops	Area (ha)	Yield (Ton/ha)	Production (Ton)	Net Return (NRS/ha)	Net Prtoduction Margin (NRS.1,000)
Without Project					
Paddy	2,300	2.00	4,600	11,470	26,381
Mustard	450	0.50	225	3,939	1,773
Vegetables (Onion,Garlic)	500	5.00	2,500	6,787	3,394
Total	3,250		7,325		**31,547**
					(11,684 Rs/ha)
With Project					
Paddy	2,300	3.00	6,900	19,466	44,772
Wheat	700	2.20	1,540	22,790	15,953
Mustard	200	0.80	160	7,611	1,522
Potato	300	10.00	3,000	41,858	12,557
Onion	1,000	8.00	8,000	15,415	15,415
Total	4,500		19,600		**90,219**
					(33,415 Rs/ha)

<Incremental Gross Margin>
Total Rs.(1,000) : 58,672
Per Hectare Rs. : 21,731

Table 7.2.3 SURKHET VALLEY IRRIGATION SCHEME
INDIVIDUAL CROP BUDGETS AT ECONOMIC PRICES

Unit : NPS/ha

Crops	Yield			Cost						Net Return (a) - (b)
	Yield (Ton)	Price (NPS/Ton)	Gross Return (a)	Seeds	Labour	Draft Animal	Fertilizers	Other Cost	Total Cost (b)	
Without Project										
Paddy	2.00	9,660	19,320	600	3,159	2,362	1,534	195	7,850	11,470
Mustard	0.50	14,910	7,455	180	1,404	1,485	447	0	3,516	3,939
Vegetables (Onion,Garlic)	5.00	4,480	22,400	9,900	2,565	1,485	1,403	260	15,613	6,787
With Project										
Paddy	3.00	9,660	28,980	250	3,510	2,565	2,779	410	9,514	19,466
Wheat	2.20	14,110	31,042	800	2,484	202	2,683	260	8,252	22,790
Mustard	0.80	14,910	11,928	180	1,755	1,485	832	65	4,317	7,611
Potato	10.00	4,480	44,800	450	945	742	805	0	2,942	41,858
Onion	8.00	4,480	35,840	11,700	3,240	1,890	3,165	430	20,425	15,415

<Note> Return Price : Used World Bank Economic Price
Cost Price : Babai Irrigation Project Economic Price
Yield Ton : Surkhet Valley Study Report (Oct,1992 DOI)

Table 7.2.4 **ECONOMIC INTERNAL RATE OF RETURN (EIRR) FOR SURKHET VALLEY IRRIGATION SCHEME**

Unit : NRS. 1,000

Year	Capital Cost	O&M Cost	Benefit	(Benefit - Cost)
-5	93,500			-93,500
-4	93,500			-93,500
-3	93,500			-93,500
-2	56,100			-56,100
-1	37,400			-37,400
0		11,270	7,481	-3,789
1		11,270	12,468	1,198
2		11,270	24,936	13,666
3		11,270	37,403	26,133
4		11,270	49,871	38,601
5		11,270	49,871	38,601
6		11,270	49,871	38,601
7		11,270	49,871	38,601
8		11,270	49,871	38,601
9		11,270	49,871	38,601
10		11,270	49,871	38,601
11		11,270	49,871	38,601
12		11,270	49,871	38,601
13		11,270	49,871	38,601
14		11,270	49,871	38,601
15		11,270	49,871	38,601
16		11,270	49,871	38,601
17		11,270	49,871	38,601
18		11,270	49,871	38,601
19		11,270	49,871	38,601
20		11,270	49,871	38,601
21		11,270	49,871	38,601
22		11,270	49,871	38,601
23		11,270	49,871	38,601
24		11,270	49,871	38,601
25		11,270	49,871	38,601
26		11,270	49,871	38,601
27		11,270	49,871	38,601
28		11,270	49,871	38,601
29		11,270	49,871	38,601
30		11,270	49,871	38,601

EIRR = 6.0339%

<Note> Construction Schedule is 5 years
Capital Cost : 85% of Total Construction
O/M Cost : 3% of Direct Construction Cost

Table 7.3.1 KORELLIKHOLA BASIN LIFT IRRIGATION SCHEME
INDIVIDUAL CROP BUDGETS AT ECONOMIC PRICES

<Incremental Production>

Crops	Without Project			With Project			Incremental
	Area (ha)	Yield (Ton)	Production (Ton)	Area (ha)	Yield (Ton)	Production (Ton)	Production (Ton)
Paddy	166	2.0	332	221	3.0	663	331
Maize	166	0.7	116	147	2.0	294	178
Wheat	-	-	-	221	2.2	486	486
Total			**448**			**1,443**	**995**

<Incremental Gross Return> **Net Area = 368 ha**

Crops	Area (ha)	% of CCA	Yield (Ton)	Price (NPS/Ton)	Margin (Rs./ha)	Margin of Net Area (a) (1,000Rs.)	Input Cost						Total Input of Net Aera (b) (1,000NRs.)	**Net Return (a) - (b) (1,000NRs.)**
							Seeds (NRs./ha)	Labour (NRs./ha)	Draft Animal (NRs./ha)	Fertilizers (NRs./ha)	Others (NRs./ha)	Total Cost (NRs./ha)		
Without Project														
HYV Paddy	166	45.0%	2.00	9,660	19,320	3,207	600	3,159	2,362	1,534	195	7,850	1,303	1,904
Maize	166	45.0%	0.70	10,410	7,287	1,210	140	1,674	1,215	0	45	3,074	510	699
Total						**4,417**							**1,813**	**2,603**
With Project														
HYV Paddy	221	60.0%	3.40	9,660	32,844	7,259	250	3,510	2,565	2,779	410	9,514	2,103	5,156
Maize	147	40.0%	2.10	10,410	21,861	3,214	175	2,052	1,417	1,306	110	5,060	744	2,470
Wheat	221	60.0%	2.50	14,110	35,275	7,796	800	2,484	2,025	2,683	260	8,252	1,824	5,972
Total						**18,268**							**4,670**	**13,598**
													Incremental Gross Margin	**10,994**

<Note> Price : Used World Bank Economic Price
Input Cost : Used World Bank Price only for Fertilizers, Babai I/P Economic Price for others

Table 7.3.2

ECONOMIC INTERNAL RATE OF RETURN (EIRR)
FOR KORELLI KHOLA BASIN LIFT IRRIGATION SCHEME

Unit : NRS. 1,000

Year	Capital Cost	O/M Cost	Electric Charges	Benefit	(Benefit - Cost)
-3	7,480				-7,480
-2	3,740				-3,740
-1	26,180				-26,180
0		1,122	3,723	4,672	-173
1		1,122	3,723	6,541	1,696
2		1,122	3,723	8,410	3,565
3		1,122	3,723	9,344	4,499
4		1,122	3,723	9,344	4,499
5		1,122	3,723	9,344	4,499
6		1,122	3,723	9,344	4,499
7		1,122	3,723	9,344	4,499
8		1,122	3,723	9,344	4,499
9		1,122	3,723	9,344	4,499
10	11,970	1,122	3,723	9,344	-7,471
11		1,122	3,723	9,344	4,499
12		1,122	3,723	9,344	4,499
13		1,122	3,723	9,344	4,499
14		1,122	3,723	9,344	4,499
15		1,122	3,723	9,344	4,499
16		1,122	3,723	9,344	4,499
17		1,122	3,723	9,344	4,499
18		1,122	3,723	9,344	4,499
19		1,122	3,723	9,344	4,499
20	11,970	1,122	3,723	9,344	-7,471
21		1,122	3,723	9,344	4,499
22		1,122	3,723	9,344	4,499
23		1,122	3,723	9,344	4,499
24		1,122	3,723	9,344	4,499
25		1,122	3,723	9,344	4,499
26		1,122	3,723	9,344	4,499
27		1,122	3,723	9,344	4,499
28		1,122	3,723	9,344	4,499
29		1,122	3,723	9,344	4,499
30		1,122	3,723	9,344	4,499

EIRR = 7.3229%

<Note> O/M Cost : 3% of of Direct Construction Cost
Capital Cost : 85% of Total Construction Cost
Construction Schedule : 5 Years (20%, 10%, 70%)
Replacement Cost : 19,000 x 1,000NRS x 0.7 x 0.9=11,970

Table 7.4.1 GARJYANGKOT IRRIGATION SCHEME
INDIVIDUAL CROP BUDGETS AT ECONOMIC PRICES

<Incremental Production>

Crops	Without Project			With Project			Incremental
	Area (ha)	Yield (Ton)	Production (Ton)	Area (ha)	Yield (Ton)	Production (Ton)	Production (Ton)
Paddy	40	2.0	80	200	3.0	600	520
Wheat	80	1.1	88	80	2.2	176	88
Barley	60	1.0	60	60	1.5	90	30
Millet	60	1.1	66	-	-	-	-66
Potato	-	-	-	60	6.0	360	360
Total			**294**			**1,226**	**932**

<Incremental Gross Return> **Net Area = 200 ha**

Crops	Area (ha)	% of CCA	Yield (Ton)	Price (NPS/Ton)	Margin (a) (Rs./ha)	Margin of Net Area (a) (1,000Rs.)	Input Cost						Total Input of Net Aera (b) (1,000NRs.)	**Net Return (a) - (b)** (1,000NRs.)
							Seeds (NRs./ha)	Labour (NRs./ha)	Draft Animal (NRs./ha)	Fertilizers (NRs./ha)	Others (NRs./ha)	Total Cost (NRs./ha)		
Without Project														
HYV Paddy	40	20.0%	2.00	9,660	19,320	773	600	3,159	2,362	1,534	195	7,850	314	459
Wheat	80	40.0%	1.10	14,110	15,521	1,242	800	2,322	2,565	447	130	6,264	501	741
Barley	60	30.0%	1.00	4,480	4,480	269	450	810	742	0	0	2,002	120	149
Millet	60	30.0%	1.10	4,480	4,928	296	450	810	742	0	0	2,002	120	176
Total					**44,249**	**2,579**							**1,055**	**1,524**
With Project														
HYV Paddy	200	100.0%	3.00	9,660	28,980	5,796	250	3,510	2,565	2,779	410	9,514	1,903	3,893
Wheat	80	40.0%	2.20	14,110	31,042	2,483	800	2,484	202	2,683	260	6,429	514	1,969
Barley	60	30.0%			6,720	403	450	945	742	805	0	2,942	177	227
Potato	60	30.0%	6.00	4,480	26,880	1,613	450	945	742	805	0	2,942	177	1,436
Total						**10,295**							**2,770**	**7,525**
												Incremental Gross Margin		**6,002**

<Note> Price : Used World Bank Economic Price
Input Cost : Used World Bank Price only for Fertilizers, Babai I/P Economic Price for others

Table 7.4.2 ECONOMIC INTERNAL RATE OF RETURN (EIRR) FOR GARJYANGKOT IRRIGATION SCHEME

Unit : NRS. 1,000

Year	Capital Cost	O&M Cost	Benefit	(Benefit - Cost)
-3	6,744			-6,744
-2	8,993			-8,993
-1	6,744			-6,744
0		688	2,551	1,863
1		688	3,571	2,883
2		688	4,591	3,903
3		688	5,101	4,413
4		688	5,101	4,413
5		688	5,101	4,413
6		688	5,101	4,413
7		688	5,101	4,413
8		688	5,101	4,413
9		688	5,101	4,413
10		688	5,101	4,413
11		688	5,101	4,413
12		688	5,101	4,413
13		688	5,101	4,413
14		688	5,101	4,413
15		688	5,101	4,413
16		688	5,101	4,413
17		688	5,101	4,413
18		688	5,101	4,413
19		688	5,101	4,413
20		688	5,101	4,413
21		688	5,101	4,413
22		688	5,101	4,413
23		688	5,101	4,413
24		688	5,101	4,413
25		688	5,101	4,413
26		688	5,101	4,413
27		688	5,101	4,413
28		688	5,101	4,413
29		688	5,101	4,413
30		688	5,101	4,413

EIRR = 14.6698%

(Note : O&M Cost is 3.0% of Capital Cost)

FIGURES

Figure 1.1.1 Organization Chart - DOI within the Ministry of Water Resources

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

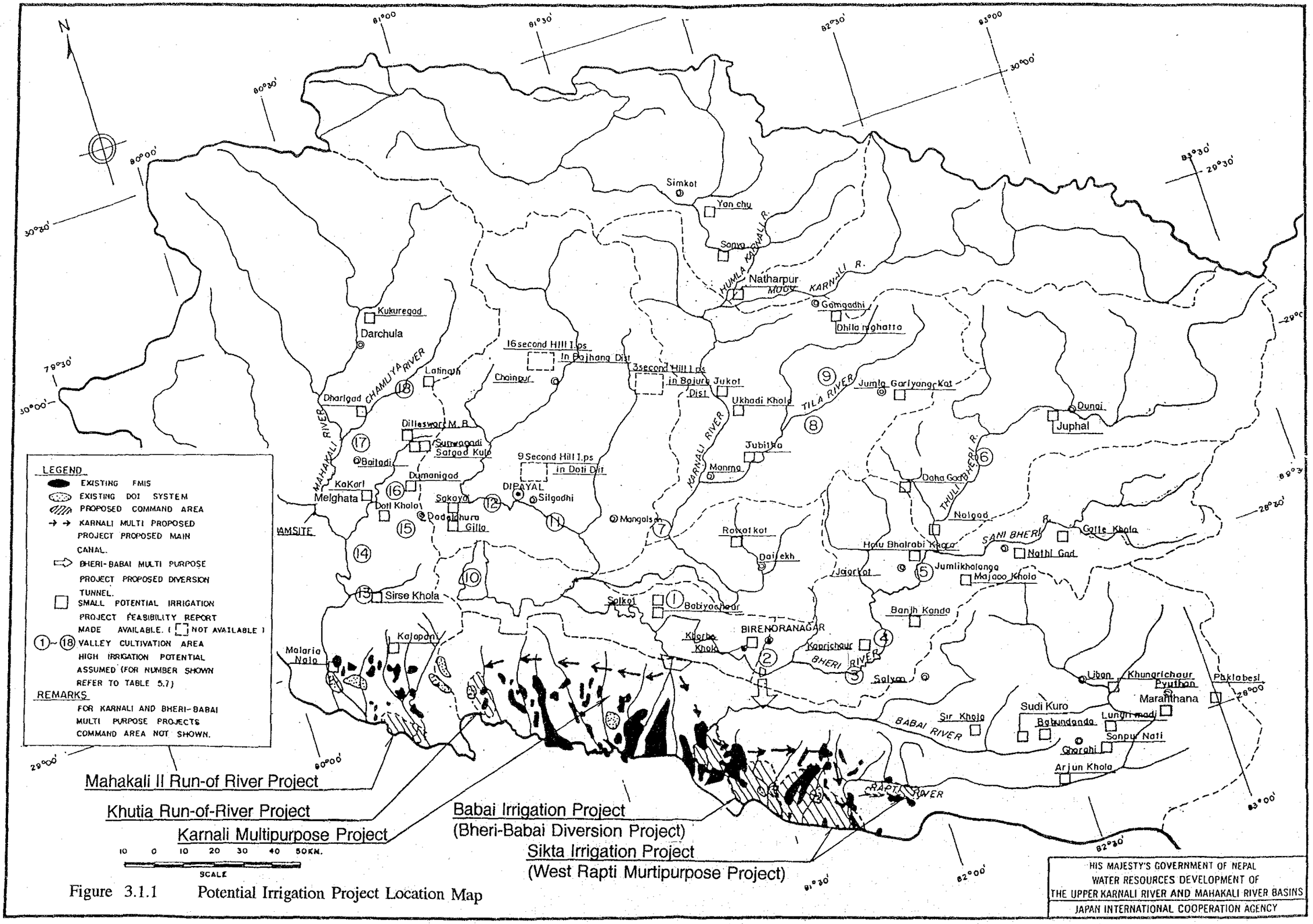


Figure 3.1.1 Potential Irrigation Project Location Map

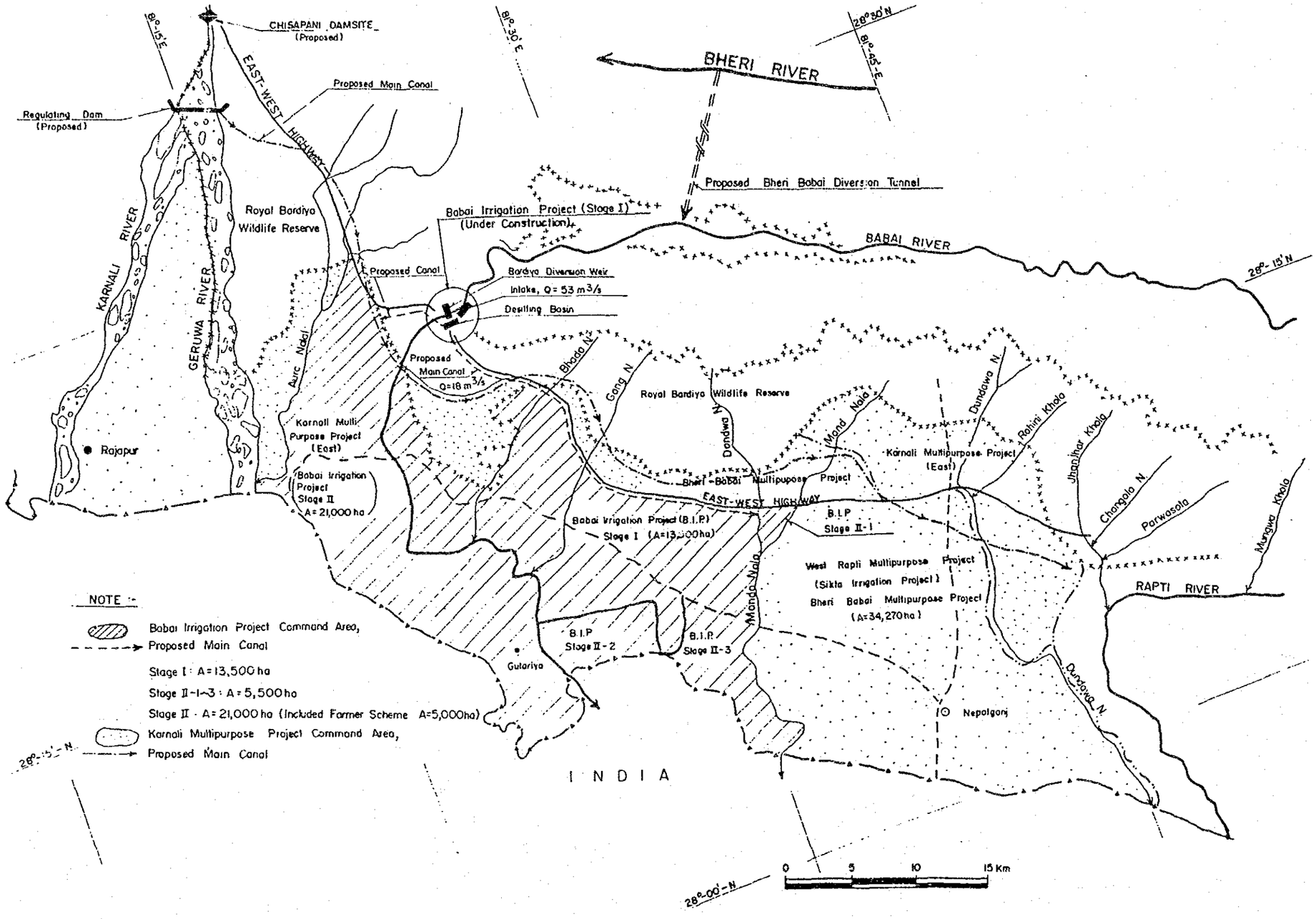
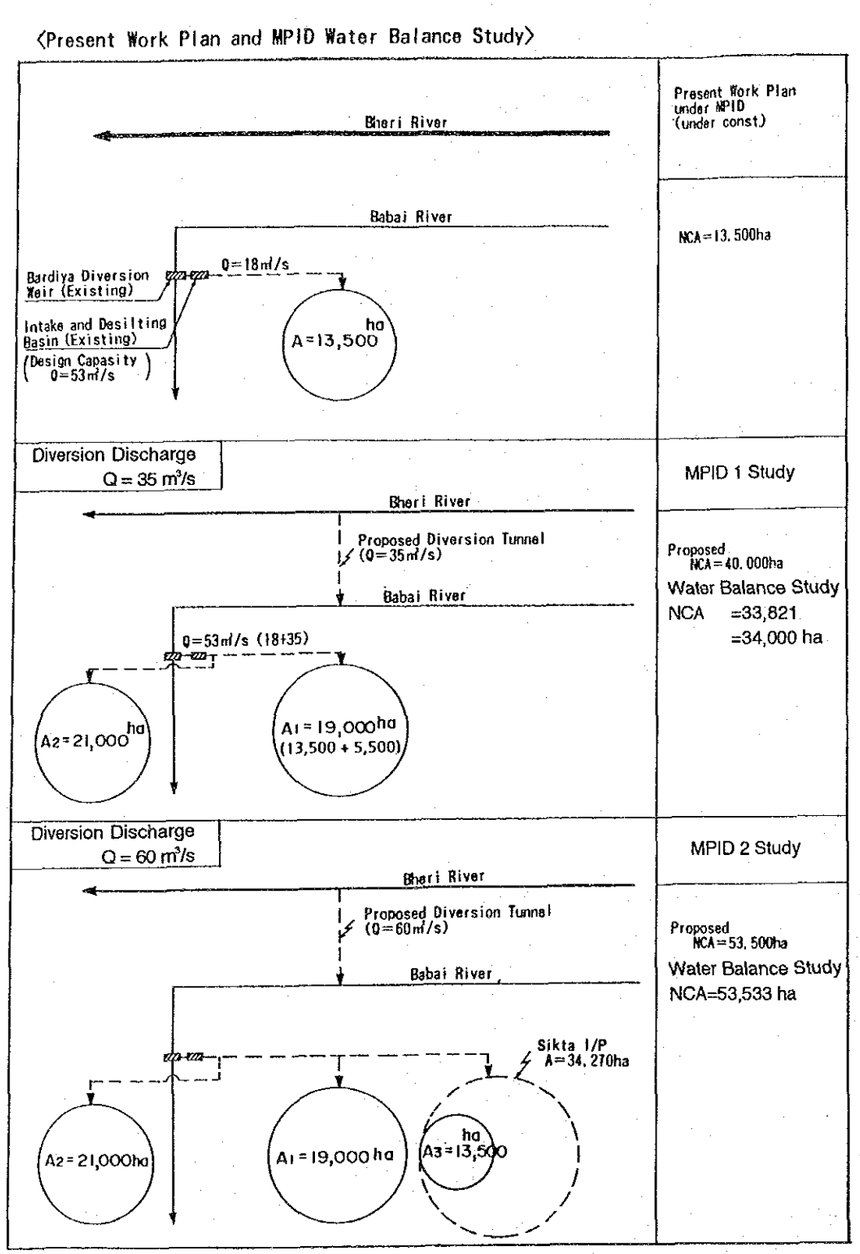


Figure 3.2.1 Bheri-Babai Diversion Project

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY



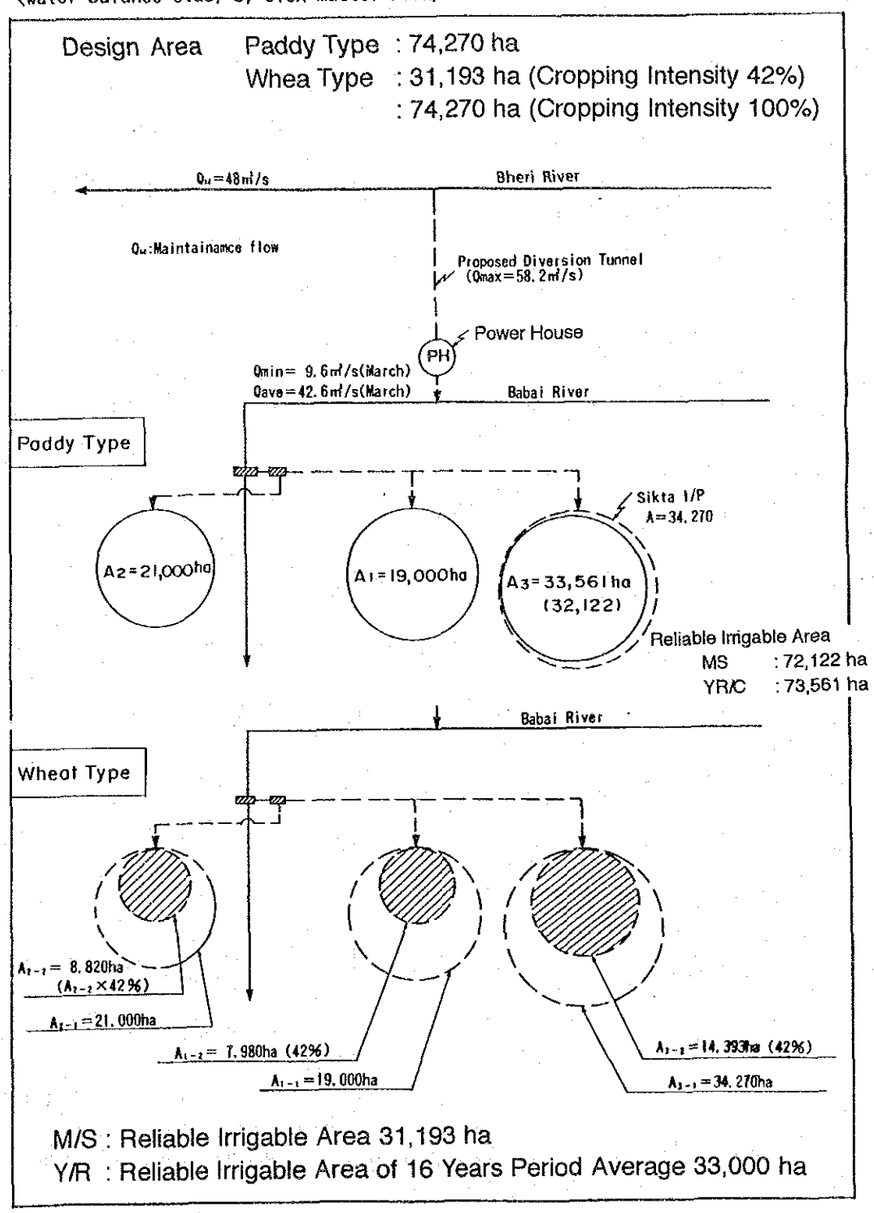


Figure 4.1.1 Schematic Diagram of the Bheri-Babai Diversion Potential Scheme Water Balance Study

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

(1) Water Requirents

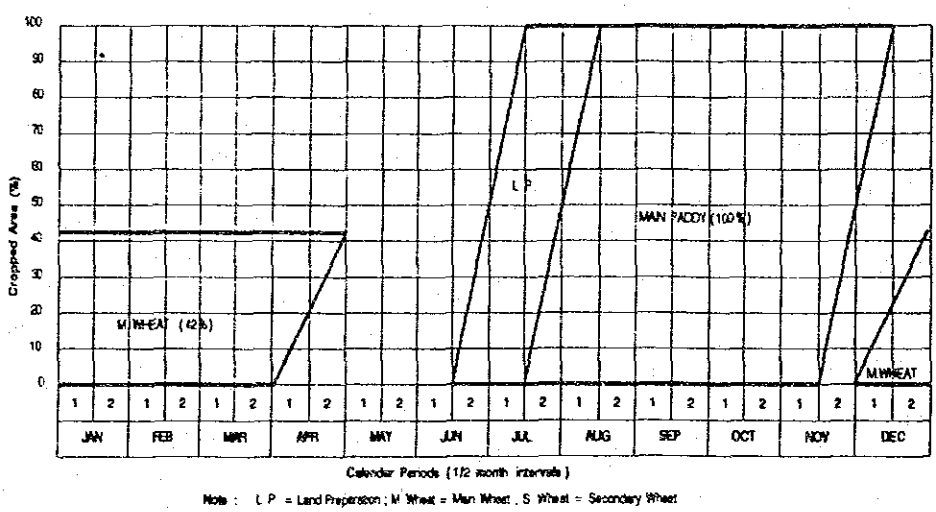
(1)-1 Irrigation Water Requirements for Selected Area : (Unit : Mm3/1,000 ha.)

CASE C-Pattern	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
(1) No.4-TW/MS	0.752	0.896	1.414	0.605	0.000	1.200	1.869	1.779	2.379	3.528	2.408	1.001	17.831
(2) No.5-TW/YR/C	1.699	2.073	3.397	1.710	0.490	1.312	1.735	1.651	2.322	3.459	2.358	1.463	23.669

(1)-1 Irrigation Water Requirements for Selected Area : (Unit:m³/s/1,000ha)

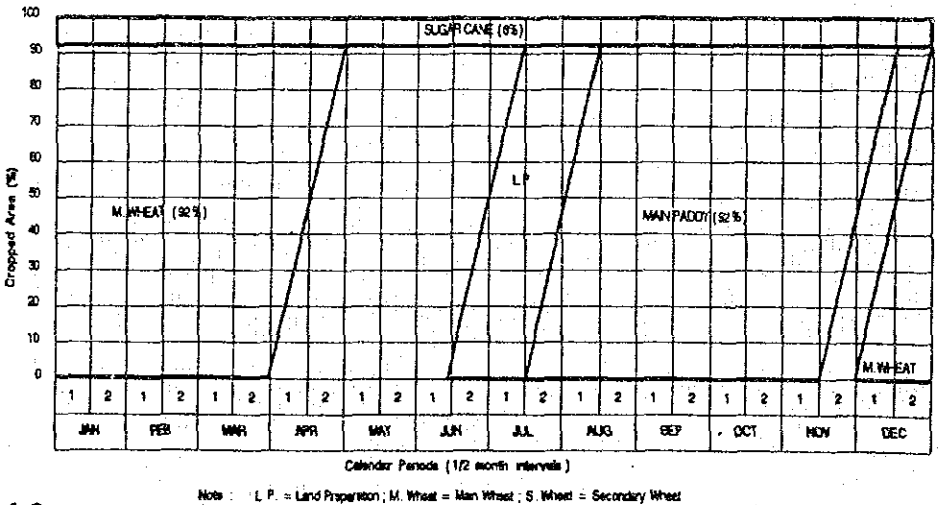
CASE C-Pattern	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
(1) No.4-TW/MS	0.280765	0.370370	0.527927	0.233410	0.000000	0.462963	0.697805	0.664203	0.917824	1.317204	0.929012	0.373731	6.775214
(2) No.5-TW/YR/C	0.634334	0.856895	1.268295	0.659722	0.182945	0.506173	0.647775	0.616413	0.895883	1.291443	0.909722	0.546222	9.015772

Cropping Pattern No.: 4 Cropping Pattern Name : T/W/MS



Note : L.P. = Land Preparation ; M. Wheat = Main Wheat ; S. Wheat = Secondary Wheat

Cropping Pattern No.: 5 Cropping Pattern Name : T/W/YR/C



Note : L.P. = Land Preparation ; M. Wheat = Main Wheat ; S. Wheat = Secondary Wheat

Figure 4.1.2

Irrigation Water Requirement and Cropping Pattern for Bheri-Babai Irrigation Scheme

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

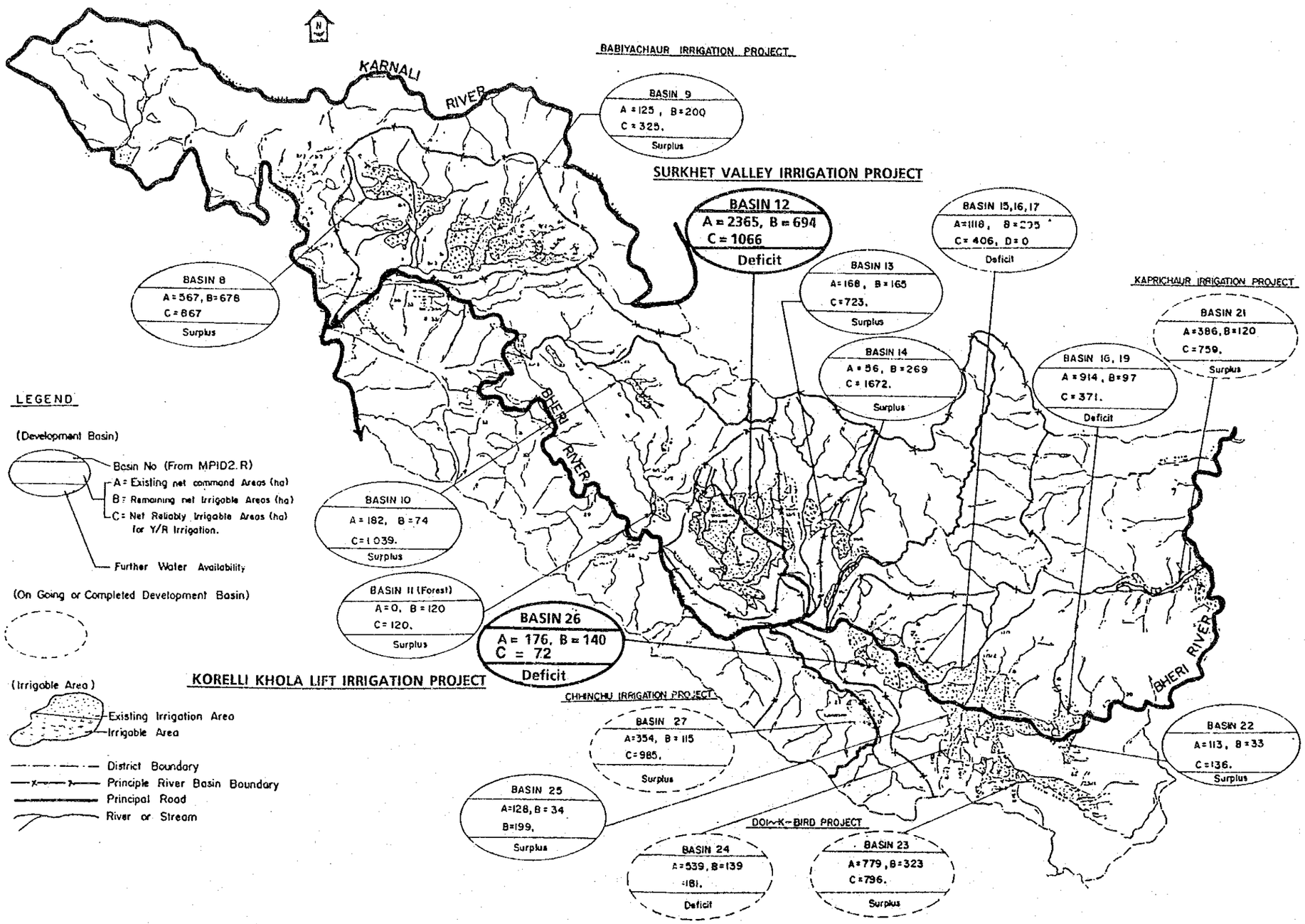


Figure 4.2.1 Potential Scheme Sites in Surket District
(Babiyanchur, Surket Valley and Korelli Khola Lift Irrigation Schemes)

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

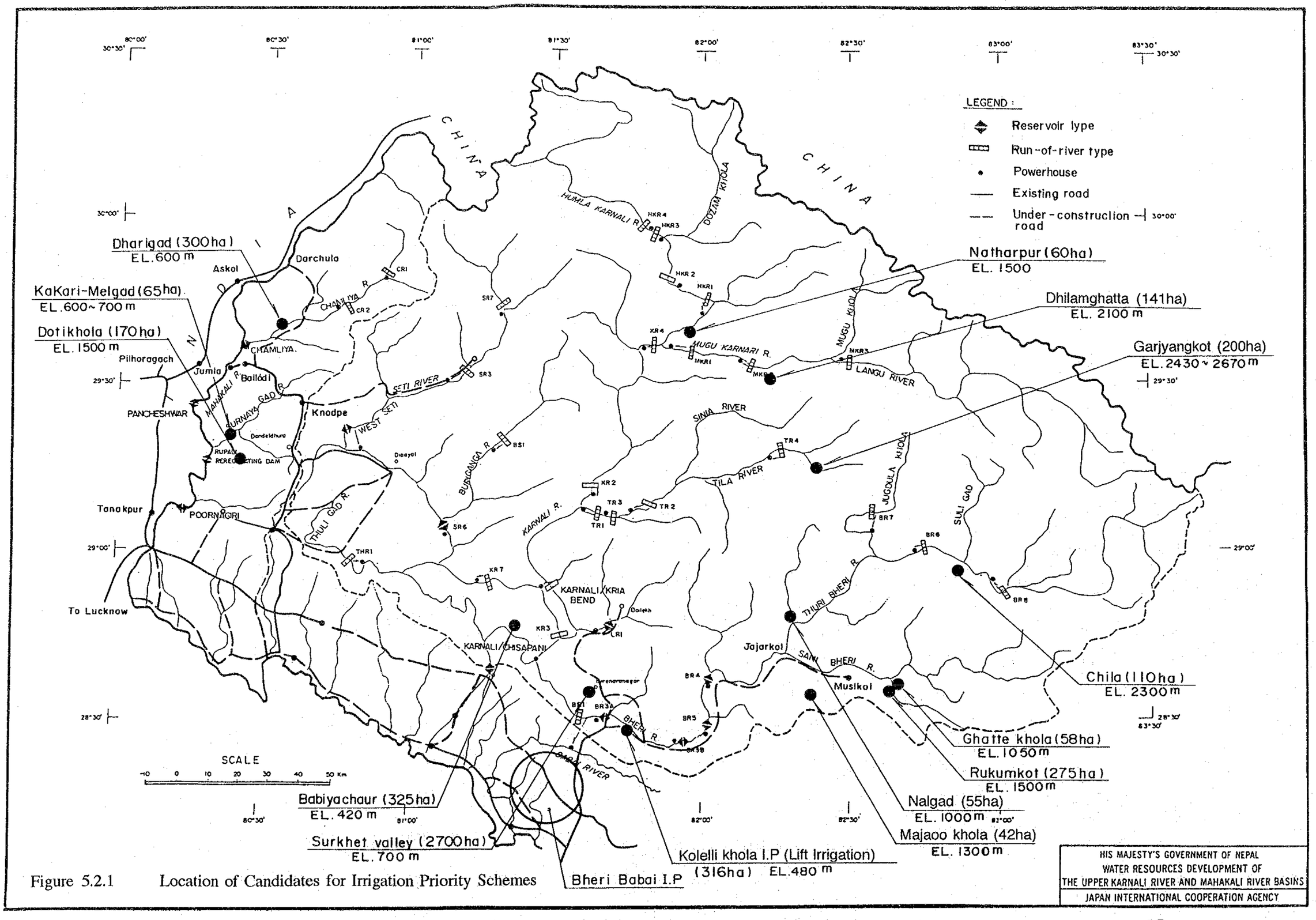


Figure 5.2.1 Location of Candidates for Irrigation Priority Schemes

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

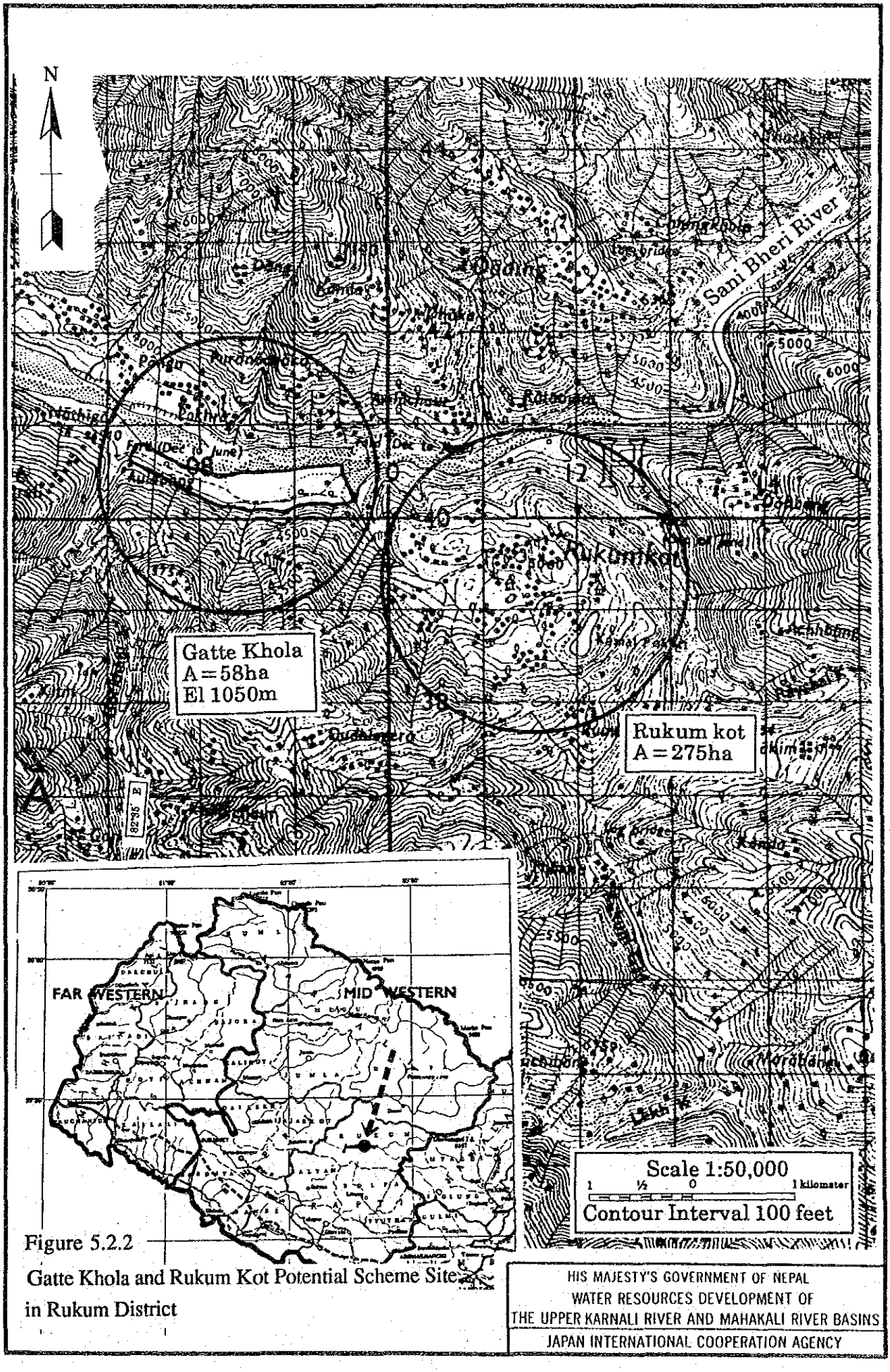


Figure 5.2.2
Gatte Khola and Rukum Kot Potential Scheme Site in Rukum District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

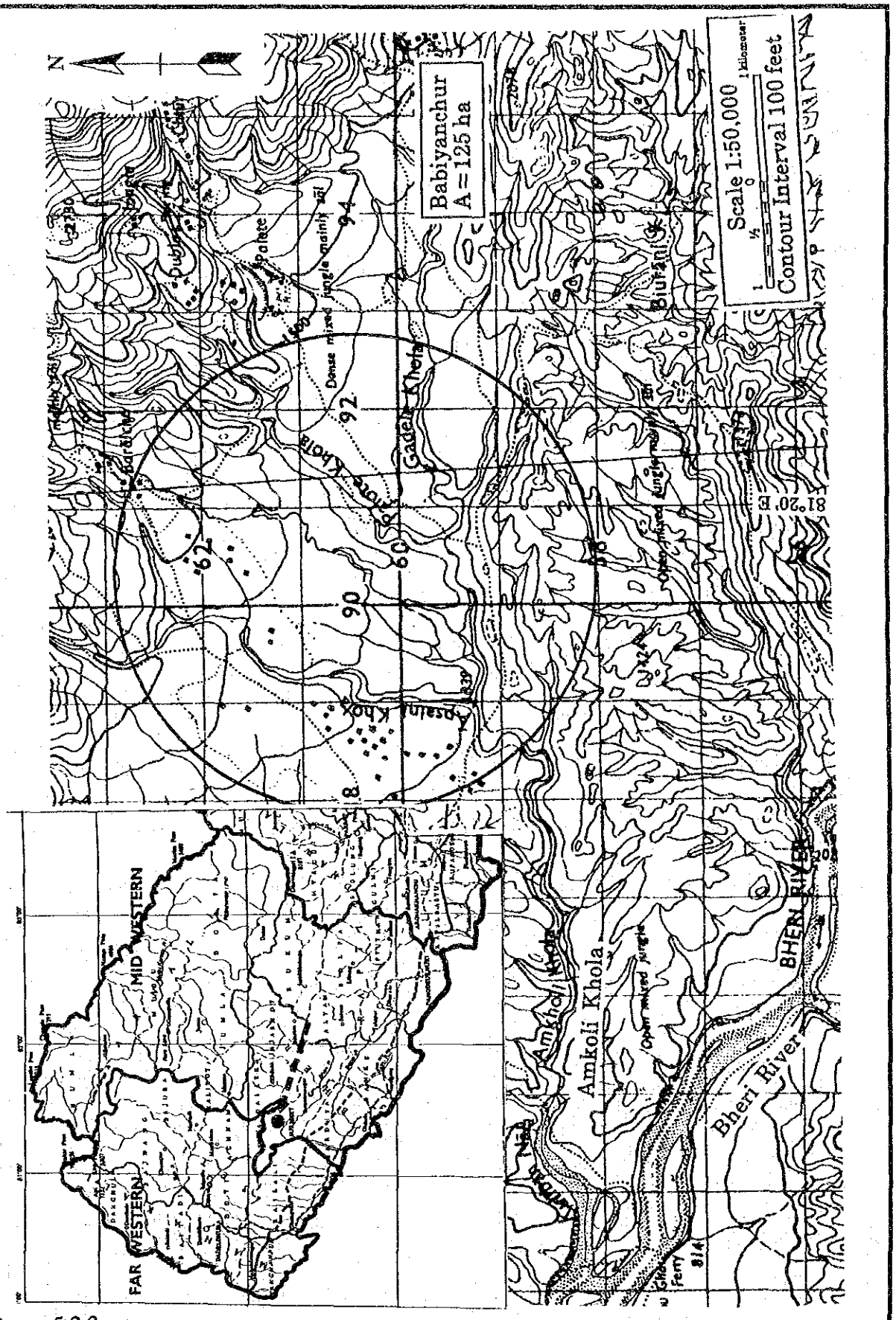


Figure 5.2.3

Babiyanchur Potential Irrigation Scheme Site in Surket District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 5.2.4
Surket Valley Potential Irrigation Scheme Site in Surket District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

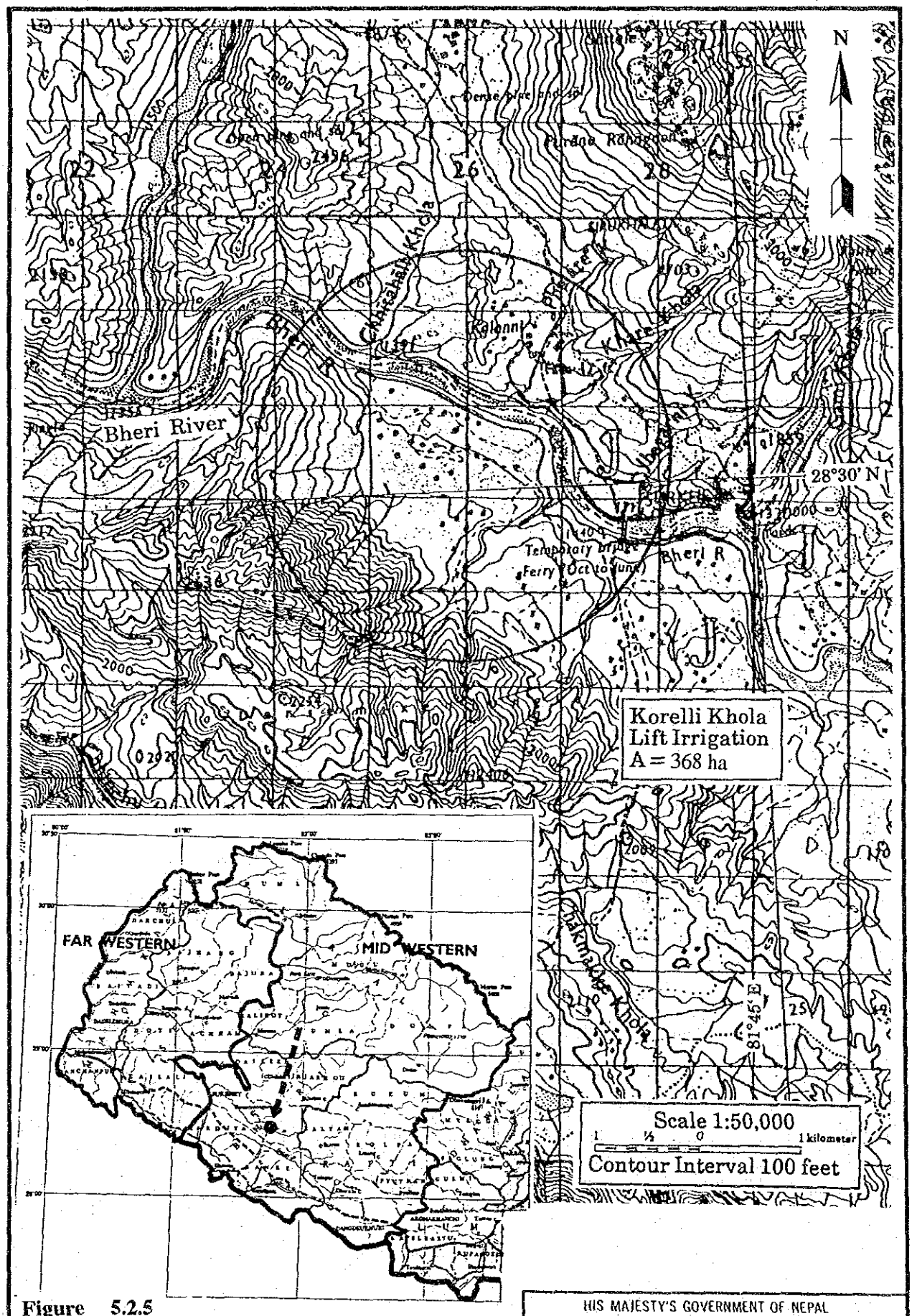


Figure 5.2.5
Korelli Khola Lift Potential Irrigation Scheme Site in Surkhet District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

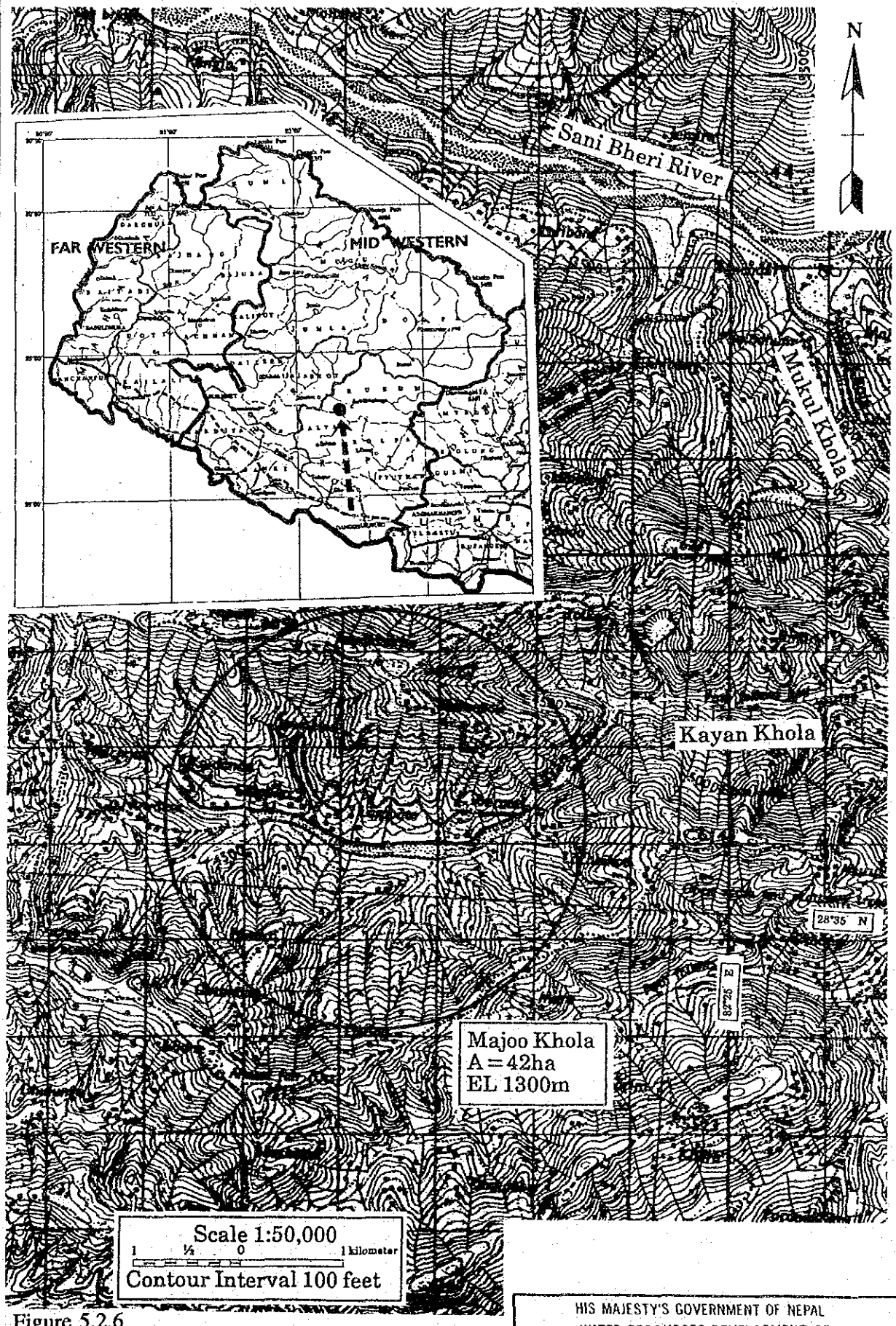


Figure 5.2.6
Majoo Khola Potential Scheme Site
in Rukum District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

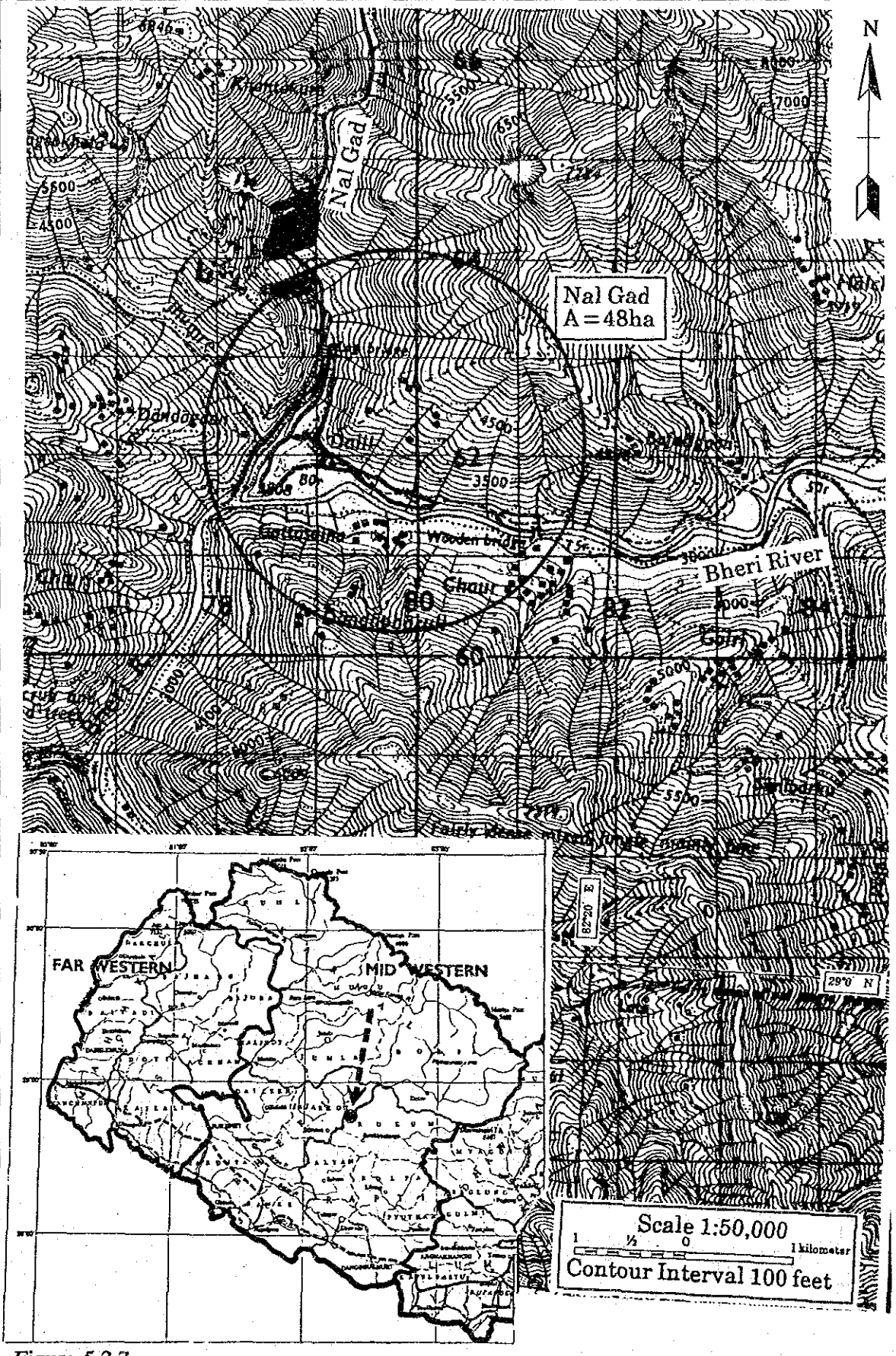


Figure 5.2.7

Nepgad (Nalgad) Potential Scheme Site
in Jajarkot District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

Scheme name	Chaila
Region	Mid. Western
Zone	Karnali
District	Dolpa
Water source	Ghungharu
Net area	110 ha
Project site	Unidentified

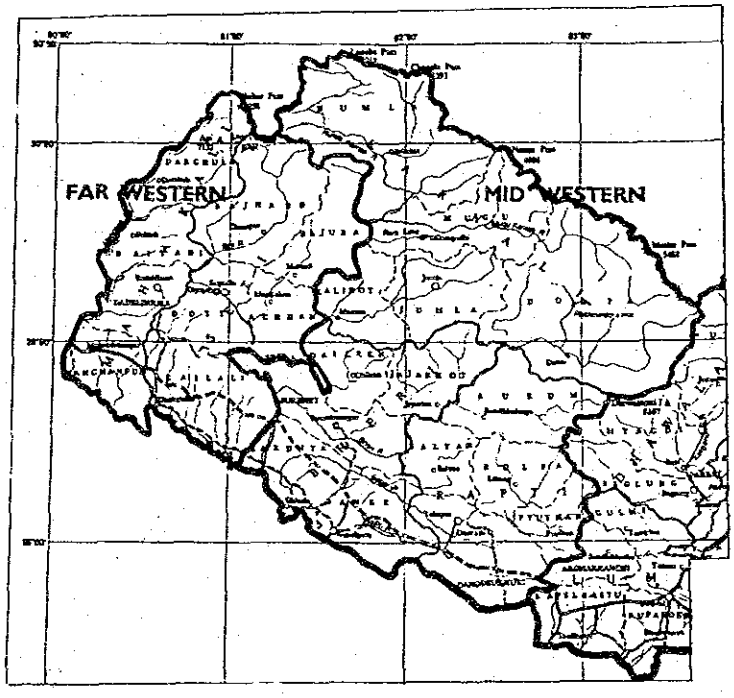


Figure 5.2.8

Chaila Potential Scheme Site
in Dolpa District

HIS MAJESTY'S GOVERNMENT OF NEPAL
WATER RESOURCES DEVELOPMENT OF
THE UPPER KARNALI RIVER AND MAHAKALI RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY