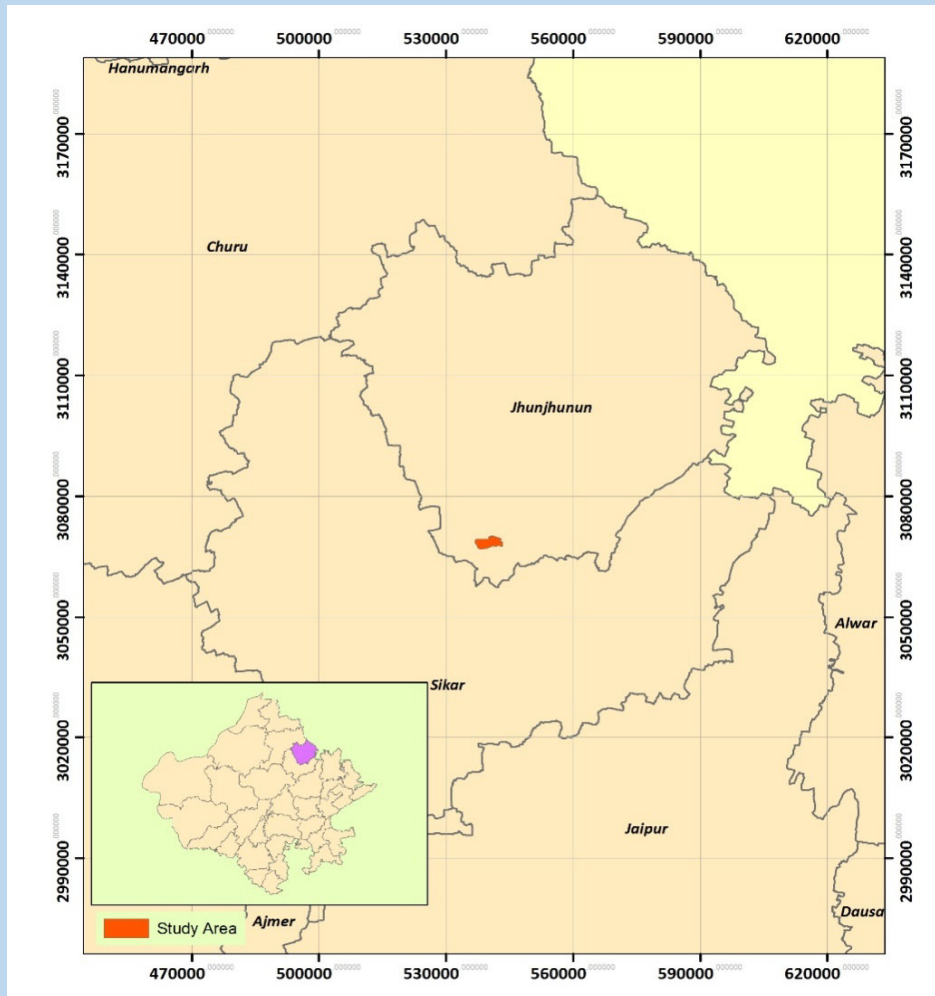


FINAL IMPACT EVALUATION REPORT **(ENDLINE)**

JHUNJHUNU (IWMP) 3/2009-10 **Block- Nawalgarh, District Jhunjhunu**



Submitted to:



***Watershed Development
& Soil Conservation
Department, Pant Krishi
Bhavan, GoR, JAIPUR***

Submitted by:



***Arpan Seva Sansthan,
(MEL&D Agency) Plot No.
210, Flat no. F2, Shri Shyam
Baba Apartment, Rani Sati
Nagar, Ajmer Road, Jaipur***

Executive Summary for Final Impact Evaluation

Generic Information of Project:

1	Name:	IWMP – 3, 2009-10, Jhunjhunu											
2	Area in Ha.:	4672											
3	Cost (Rs. in Lakhs):	700.80											
4	Total No. of Household in project area:	3041											
5	No. of Household for benchmark study (20%):	608											
6	Control Area in Ha for (Non-project):	4652											
7	Total No. of Household in Control area:	3731											
8	No. of Household for benchmark study (20%) in control area:	746											
9	Area in Ha. for satellite imagery (25%):	1492											
	Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
	Avg. Annual Rain Fall (mm)	550	284	655	752	838	423	548	502	384	269	379	

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1	NRM (Natural Resource Management)											
1.1	<i>Increase in under cultivation crop area in Ha.</i>											
1.1.1	Kharif	1885	2285	400	21.22	1905	1985	80	4.20	183.39	174.53	-8.87
1.1.2	Rabi	375	405	30	8.00	405	421	16	3.95	306.91	387.75	80.84
1.1.3	Ziad	105	112	7	6.67	107	110	3	2.80	84.28	104.77	20.50

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.2	Area under Irrigation (Ha)											
1.2.1	Kharif	185	235	50	27.03	198	211	13	6.57	NA		
1.2.2	Rabi	225	285	60	26.67	230	245	15	6.52			
1.2.3	Ziad	105	112	7	6.67	107	110	3	2.80			
1.3	Total Cropped Area (Ha)											
1.3.1	Single Crop	1510	1880	370.00	24.50	1500	1564	64	4.27	183.39	174.53	-8.87
1.3.2	Double Crop	480	517	37.00	7.71	512	531	19	3.71	306.91	387.75	80.84
1.3.3	Multiple Crop	105	112	7.00	6.67	107	110	3	2.80	84.28	104.77	20.50
1.4	Productivity of Crop (Ton/Ha)											
1.4.1	Kharif	0.88	1.18	0.3	34.09	0.83	0.92	0.09	10.84	NA		
1.4.2	Rabi	1.83	2.05	0.22	12.02	1.78	1.89	0.11	6.18			
1.4.3	Ziad	0.85	1.05	0.2	23.53	0.75	0.84	0.09	12.00			
1.5	New package of practices %											
1.5.1	Certified Seed	88.00	95.00	NA	7.00	85.00	89.00	NA	4.00	NA		
1.5.2	Hybrid Seed	68.00	78.00	NA	10.00	65.00	77.00	NA	12.00			
1.5.3	Culture	20.00	39.00	NA	19.00	19.00	23.00	NA	4.00			
1.5.4	Pesticide	77.00	70.00	NA	-7.00	76.00	75.00	NA	-1.00			
1.5.5	Insecticide	87.00	83.00	NA	-4.00	85.00	80.00	NA	-5.00			
1.5.6	Fertilizer	89.00	84.00	NA	-5.00	88.00	77.00	NA	-11.00			
1.5.7	Manure	100.00	100.00	NA	0.00	100.00	100.00	NA	0.00			
1.5.8	Vermi Compost	5	12.50	NA	7.50	4	6.50	NA	2.50			
1.5.9	Compost	96	99.00	NA	3.00	94	96.00	NA	2.00			
1.6	Change in cropping pattern											
1.6.1	Barani cropped Area (Ha)	375	405	30	8.00	405	421	16	3.95	NA		
1.6.2	Irrigated cropped Area (Ha)	330	397	67	20.30	337	355	18	5.34			
1.6.3	Single cropped Area (Ha)	1510	1880	370	24.50	1500	1564	64	4.27	183.39	174.53	-8.87

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.6.4	Double cropped Area (Ha)	480	517	37	7.71	512	531	19	3.71	306.91	387.75	80.84
1.6.5	Multiple cropped Area (Ha)	105	112	7	6.67	107	110	3	2.80	84.28	104.77	20.50
1.6.6	Fellow cropped area (Ha.)	120	102	-18	-15.00	112	128	16	14.29	668.63	739.43	70.80
1.7	Improvement of Bio- mass											
1.7.1	Agro Horticulture in Ha.	18	24.5	6.5	36.11	13	14.5	1.5	11.54	NA		
1.7.2	Agro Forestry in Ha.	1885	2285	400	21.22	1905	1985	80	4.20			
1.8	Change in diversification into crop Ha.											
1.8.1	Mono Cropped in Ha.	1885	2285	400	21.22	1905	1985	80	4.20	NA		
1.8.2	Inter Cropped in Ha.	375	405	30	8.00	405	421	16	3.95			
1.8.3	Mixed Cropped in Ha.	105	112	7	6.67	107	110	3	2.80			
1.9	Change in commercial crops in Ha.											
1.9.1	Pulses (Ha)	25	35	10	40.00	18	20	2	11.11	NA		
1.9.2	Till (Ha)	18	24	6	33.33	14	17	3	21.43			
1.9.3	Mustard (Ha)	45	52	7	15.56	30	34	4.00	13.33			
1.9.4	Spices (Ha)	15	19	4	26.67	14	16	2	14.29			
1.9.5	Others (Ha)	12	14	2	16.67	15	18	3	20.00			
1.10	Increase in cropping intensity in %											
1.10.1	Kharif	9.81	10.28	NA	0.47	10.39	10.63	NA	0.24	NA		
1.10.2	Rabi	60.00	70.37	NA	10.37	56.79	58.19	NA	1.40			
1.11	Land use Land Cover distribution and its changes (Ha.)											
1.11.1	Agricultural	NA								1074.66	1196.93	122.27
1.11.2	Built Up									63.73	65.60	1.88
1.11.3	Forest									0.00	0.00	0.00

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.11.4	Wastelands									276.98	152.83	-124.15
1.11.5	Wetland									0.00	0.00	0.00
1.11.6	Water Bodies									0.00	0.00	0.00
1.11.7	Total									1415.36	1415.36	0.00
1.12	Change in Forest/green cover in Ha.											
1.12.1	Forest Blanks									0.00	0.00	0.00
1.12.2	Crop Land in Forest									0.00	0.00	0.00
1.12.3	Scrub Forest									0.00	0.00	0.00
1.12.4	Total									0.00	0.00	0.00
1.13	Change in Waste Lands in Ha.											
1.13.1	Barren Rocky/Stony waste/Sheet Rock									0.00	0.00	0.00
1.13.2	Gullied/Ravenous Land									0.00	0.00	0.00
1.13.3	Land with scrub									210.41	128.92	-81.49
1.13.4	Land without scrub									66.57	23.91	-42.66
1.13.5	Mining/Industrial waste									0.00	0.00	0.00
1.12.4	Total									276.98	152.83	-124.15
1.14	Difference of Area Vegetation Index											
1.14.1	Nil - Low									1.31	0.22	-1.09
1.14.2	Low - Mod.									717.50	855.76	138.26
1.14.3	Mod.- High									378.85	324.34	-54.51
1.14.4	Very High									317.70	235.05	-82.65
1.15	Soil Moisture Content and Availability through Wetness Index/ Moisture Index											

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.15.1	Nil - Low	NA								286.78	212.27	-74.51
1.15.2	Low - Mod.									387.08	375.70	-11.37
1.15.3	Mod.- High									740.92	826.16	85.24
1.15.4	Very High									0.59	1.23	0.64
1.16	Transformation from seasonal to perennial crops in Ha.(Land use diversification)	NA								Annual Crops (84.27)	Perennial Crops	38.84
										Waste lands (276.98)	Agricultural	124.08
										Agricultural	Built Up / Water bodies	1.81
1.17	Improvement in biodiversity (Yes/No)	N	Y	NA	100.00	N	N	NA	0.00	NA		
1.18	Reduction in soil loss (ton/ha.)	NA										
1.19	Reduction in run off in %	NA										
1.20	Reduction in silt deposition	NA										
2	Water Resources											
2.1	Improvement in groundwater level in mtrs.	76.41	76.81	-0.4	-0.52	75.16	76.29	-1.13	-1.50	NA		
2.2	Increase in no. of water bodies	48	600	552	1150.00	NA				NA		
2.3	Increase in surface water Storage in TCM	32.5	2007.5	1975	6076.92					NA		
2.4	Increase Drinking Water Facilities (% HHs)									NA		
2.4.1	Government supply	72.41	85.00	NA	12.59	70.16	75.50	NA	5.34	NA		

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
2.4.2	Private supply	32.06	34.50	NA	2.44	31.25	35.50	NA	4.25	NA		
2.4.3	Hand pumps	20.94	19.00	NA	-1.94	21.03	21.25	NA	0.22			
2.4.4	Tanker Supply	5.23	3.50	NA	-1.73	6.12	10.50	NA	4.38			
2.5	Water availability:									NA		
2.5.1	Availability of Drinking Water (Month)	11.5	12	0	NA	11	11	0	NA	NA		
2.5.2	Percentage of no. of families that move to different distances to fetch water (%)	1.25	1.05	-0.2	NA	1.75	1.9	0.15	NA			
2.5.3	No. of dead hand pumps (Hand Pump Rejuvenated)	10	10	0	NA	9	11	2	NA			
3	Livestock											
3.1	Increase in no. of improved breeds											
3.1.1	Cow	3176	3562	386	12.15	3247	3385	138	4.25	NA		
3.1.2	Buffalos	3885	4250	365	9.40	3839	4050	211	5.50			
3.1.3	Goat	9558	10850	1292	13.52	9559	10400	841	8.80			
3.2	Increase in milk production/ DairyActivities (Kg/day)											
3.2.1	Cow	9.50	11.00	1.5	15.79	9.50	10.25	0.75	7.89	NA		
3.2.2	Buffalos	10.00	11.50	1.5	15.00	10.00	11.00	1	10.00			
3.2.3	Goat	2.00	2.50	0.5	25.00	2.00	2.25	0.25	12.50			
3.3	Reduction in diseases out breaks and animals	NA										
3.4	Hazardous industrial activities (Y/N)	N	N	0	0	N	N	0	0	NA		

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
3.5	Rare/Endangered species of flora and fauna	NA										
3.6	Indigenous knowledge, artefacts, traditional values	NA										
3.70	Rejuvenation of local species of trees. (Y/N)	N	Y	NA	100.00	N	N	NA	0.00	NA		
4	Community Participation											
4.1	Community/Village level parameters											
4.1.1	Formation of SHG	25	130	105	420.00	22	34	12	54.55	NA		
4.1.2	No. of members	250	1300	1050	420.00	220	340	120	54.55			
4.1.3	Formation of UG	5	29	24	480.00	4	9	5	125.00			
4.1.4	No. of members	50	292	242	484.00	40	90	50	125.00			
5	Economic Aspect											
5.1	Average Annual Income (Rs)											
5.1.1	Agriculture and Livestock	23890	30254	6364	26.64	23150	26847	3697	15.97	NA		
5.1.2	Wage employment	23850	29487	5636.82	23.63	22930	27654	4724	20.60			
5.1.3	Migration	35080	40321	5241	14.94	33670	37569	3899	11.58			
5.1.4	Small enterprises	153950	175842	21892	14.22	152400	172254	19854	13.03			
5.1.5	Service	259100	295841	36741	14.18	256700	291745	35045	13.65			
5.2	Average Annual Expenditure (Rs):											
5.2.1	Food	34100	35523	1423	4.17	33640	35312	1672	4.97	NA		
5.2.2	Cloths	19620	21200	1580.05	8.05	18920	20500	1580.4	8.35			
5.2.3	Education	6730	8800	2070	30.76	6730	8700	1970	29.27			
5.2.4	Health	3000	2750	-250	-8.33	3120	2880	-240	-7.69			

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
5.2.5	Agriculture	22080	23200	1120	5.07	20610	21882	1272	6.17			
5.2.6	Household Assets	3120	3500	380	12.18	3080	3550	470	15.26			
5.2.7	Live-stock	21270	22856	1586	7.46	22360	24312	1952	8.73			
5.2.8	Conveyance	2890	3200	310	10.73	2700	3050	350	12.96			
5.2.9	Others	2960	3300	340	11.49	2770	3060	290	10.47			
6	Migration: (% HH)									NA		
6.1	Employment Opportunities (%):											
6.1.1	Agriculture and Livestock	75.63	80.5	NA	4.87	74.63	76.11	NA	1.48	NA		
6.1.2	Wage employment	48.65	51.2	NA	2.55	47.52	48.34	NA	0.82			
6.1.3	Migration	8.69	7.50	NA	-1.19	8.23	9.3	NA	1.07			
6.1.4	Small enterprises	4.25	4.5	NA	0.25	3.56	4.64	NA	1.08			
6.1.5	Service	3.12	3.5	NA	0.38	2.96	3.5	NA	0.54			
7	Outcome of important indicators											
7.1	Employment in Agriculture related activities among beneficiaries	69.5	72.25	NA	2.75	68.75	70.5	NA	1.75	NA		
7.2	Employment in Non- Agriculture Sector	48.5	51.25	NA	2.75	47.75	49	NA	1.25			
7.3	Fuel wood Production	1.3	1.6	0.3	23.08	1.2	1.3	0.1	8.33			
7.4	No. of Milch Cattle	3050	3425	375	12.30	3218	3425	207	6.43			
7.5	Milk Production of Milch Cattle	7.5	9.00	1.5	20.00	7.5	8.00	0.5	6.67			
7.6	Duration of flow of water in the streams	0	0	0		0	0	0				
7.7	No. of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship	9	14	5	55.56	6	8	2	33.33			

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4672 Ha.				Control Area 4652Ha.				Project Area 1492.00 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
7.8	Reduction in migration from rural to urban area in the project area	6.14	5.20	NA	-0.94	6.88	7.7	NA	0.82			
7.9	Annual Mean Household Income	54712	67312	12600	23.03	51100	58624	7524	14.72			
7.10	No. of children enrolled in schools in the project area.	90.5	100	9.5	10.50	91.5	100	8.5	9.29			

CHAPTER –1

Introduction - Basic information about the Project Area

1.1 Location:

The study area is located in Jhunjhunu district of Jaipur region, the northeastern district of the state, falls between 50°24'86" and 60°7'679" Easting and 30°5'7473" and 31°5'4779" Northing. The district is bounded in the north by Churu District, in the North east by Haryana state boundary, in the South-South west by Sikar District. The total area of the district is 5,926 Sq.km.

1.2 Basic details of the Project:

Girdhapura Shahpura, the Jhunjhunu IWMP-3 (2009-10) Project is in Nawalgarh Block of Jhunjhunu district. The project area is located between the 75°20' to 75°-25' North / 27°24' to 27°-55' East. The distance of the watershed area from Panchayat Samiti, Nawalgarh head quarter is **25 Km** while from the district headquarters, it is **65 Km**. There are **Six Villages** (Habitations) covering **Five Gram Panchayats** in the Project area.

Basic details of the Project:

Table: 1.1

Name of Watershed	Girdhapura Shahpura
Project ID :	Jhunjhunu IWMP 3/2009-10
Panchayat Samiti	Nawalgarh
District	Jhunjhunu
Name of PIA	A. En., WD&SC, P.S. Nawalgarh, District - Jhunjhunu
Number of Gram Panchayats	5
Number of Villages	6
Location	75°20' to 75°25' North / 27°24' to 27°55' East
Agro-Climatic Zone	II-A
Year of Sanction and Start	2009-10
Year of Project Completion	2016
Project Area	4672 Ha
Project Cost (Rs. In Lacs)	Rs. 700.80 Lacs
Major Stream	Chirana river
Slope range (%)	3 To 25 %
Name of MEL&D Agency	Arpan Seva Sansthan, Udaipur
Actual expenditure (Rs. in Lacs)	Rs. 519.16 Lacs

Source: DPR & data received from PIA

Location of 25 % Selected Area

Block - Navalgarh

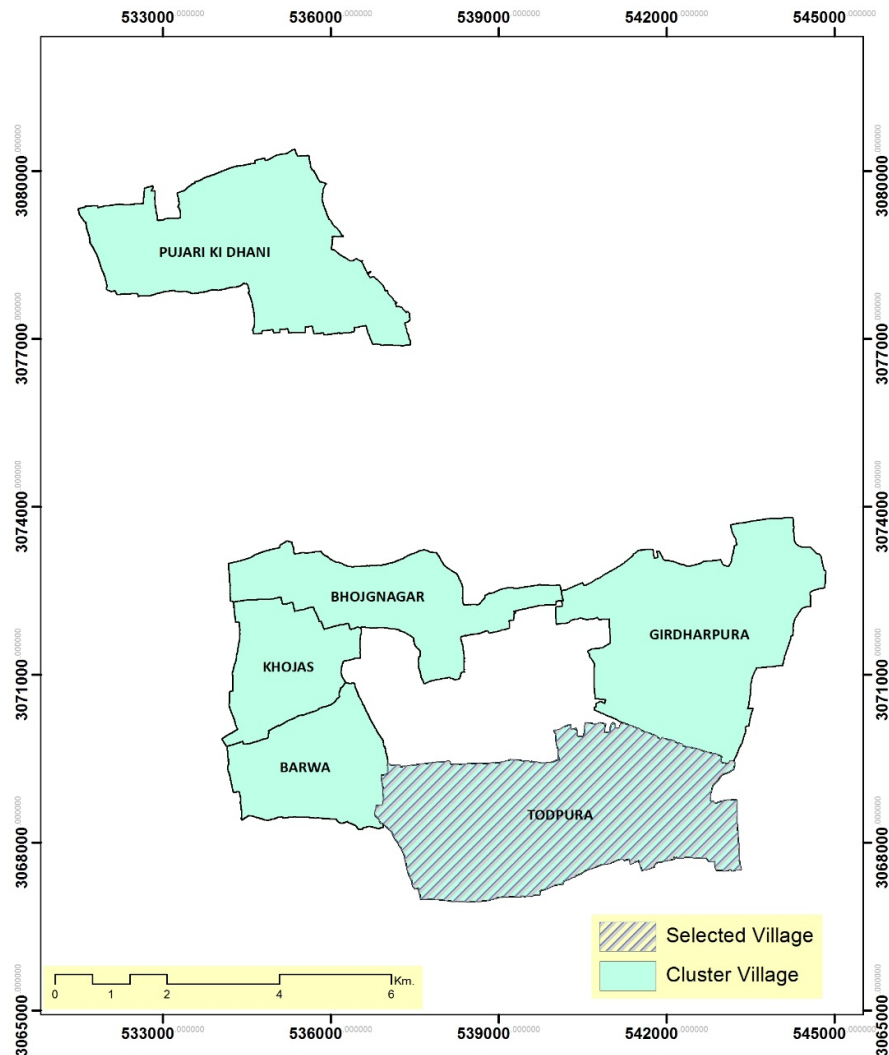


Figure 1.1 Watershed map of area

1.3 Comparison of General details of the project:

1.3.1 IWMP Watershed and Control Area details of IWMP-3/2009-10:

There is no change observed in the watershed project and control area details i.e. Gram Panchayats and villages covered, area taken up total and under sample and the number of households, which other-wise should not be.

In watershed project area as like baseline values **6 villages** were covered in **5 Gram Panchayats** with **4672 hectare** watershed project area, **3041** total number of households and **608** household in surveyed area (**20%**). In Control area as like baseline values, **5** villages were covered in **1** Gram Panchayats with **4,652** hectare control area, **3731** total number of households and **746** household in surveyed area (**20%**) during end line.

Details of Selected IWMP Watershed and Control Area of IWMP-3/2009-10 watershed of Panchayat Samiti Nawalgarh, District Jhunjhunu:

Table: 1.2

Timeline	Project Area of Watershed	Name of GP watershed	Name of Village	Corresponding GP Name of Control Area	Corresponding village Name of Control Area	Total Area of Control Area	Total House-holds in IWM P watershed	No. of House-holds (Sample in watershed @20%)	Total House-hold in Control Area	No. of Household sample in Control Area (20%)
1	2	3	4	5	6	7	8	9	10	11
Baseline	4672	Tonk Challriya, Basawa, Paraspura, Todpura, Mohanwari	Girdhapura-Shahpura, BiojNagar, Khojas, Pujari ki Dhani, Barwa, Todpura	CHIRANA	CHIRANA,DEVIPURA,RAMPURA,BAGORIYA KIDHANI,PAHADILA	4,652	3041	608	3731	746
Endline	4672	Tonk Challriya, Basawa, Paraspura, Todpura, Mohanwari	Girdhapura-Shahpura, BiojNagar, Khojas, Pujari ki Dhani, Barwa, Todpura	CHIRANA	CHIRANA,DEVIPURA,RAMPURA,BAGORIYA KIDHANI,PAHADILA	4,652	3041	608	3731	746

Source: DPR, Census data & data received from PIA

1.3.2 Fund Utilization in Jhunjhunu, IWMP-3/2009-10 project:

Details of head/component wise Financial Targets / Provisions & corresponding Expenditure / Fund Utilization by PIA, Nawalgarh, Jhunjhunu at Final Impact Evaluation stage is as under:

Fund Utilization in Jhunjhunu, IWMP-3/2009-10 project

Table: 1.3

S. No.	Name of Head/ Component	Total Financial Target As per DPR (Rs in Lacs)	Expenditure against at PIA level (Rs in Lacs)	Percentage Utilization (%)
1	2	3	4	5
1	Administration	70.08	21.52	30.71
2	Monitoring	7.01	1.46	20.83
3	Evaluation	7.01	0.00	0.00
4	EPA	28.03	27.36	97.61
5	I.&C.B.	35.04	15.64	44.63
6	D.P.R.	7.01	1.74	24.82
7	N.R.M. Works	420.48	427.80	101.74
8	Livelihood	56.06	4.50	8.03
9	Production System & Micro Enterprise	49.06	19.14	39.01
10	Consolidation & Flaxy	21.02	0.00	0.00
	Grand Total	700.80	519.16	74.08

Source: Data received from PIA

The above progress reveals that **74.08%** of funds have utilized at the Final Impact evaluation stage, which is a Good progress level. Under EPA and NRM head, the progress is **above 97%**, which is **Excellent**.

Details of PIA level Account as per data provided by PIA – Jhunjhunu IWMP-3 (2009-10):

Table: 1.4

S. No.	PIA account No. and Name of Bank	Amount Received by the PIA (Lacs)	Amount spent by PIA (Lacs)	Amount Adjusted by PIA (Lacs)
1.	6117899987 SBI Nawalgarh	44.13	40.68	38.50

Source: Data received from PIA

CHAPTER –2

Entry Point Activity

2.1 About the Entry Point Activity:

Entry Point Activity (EPA) is one of the important activities of the project area and their implementation helped to establish **credibility and rapport** between the project functionaries and the village community. Therefore, in this watershed, different need based EPA works i.e. **Solar Lights** were executed/constructed.

2.2 Proposal in DPR for EPA Work:

EPA works are a part of approved DPR, which are duly approved by Gram Sabha. There is no financial deviation as proposed in DPR and actual execution as reported looking to the demand and necessity of community. **4%** of fund against the Project cost is earmarked for EPA work.

Proposed EPA works in DPR

Table: 2.1

S.N.	EPA works- proposed	Nos.	financial provisions in Rs. Lacs
1	Solar Lights	120	28.03
	Total	120	28.03

Source: DPR & data received from PIA

2.3 Activities under taken:

During the process of collection of data of EPA works, their present status, utility and impact assessment, field visits to the watershed area were carried out by the team of Arpan Seva Sansthan and interaction with the farmers, users, PRI, Watershed Committee members and PIA etc. were conducted in detail and each EPA activity-wise data in a structured format was collected with the support of concerning PIA.

Details of executed EPA works

Table:2.2

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost (in Rs.)	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP				Expected	Actual	
1	2	3		4	5	6	7	8	9	10	11
1	Solar Light (14)	27.767575	75.382718	Bhojnagar	Tonk Chilari	2010-11	3.50	3.39	Solar Light Use for Lighting In Night	Useful for Lighting In Night	15
2	Solar Light (26)	27.850693	75.348179	Pujari Ki Dhani	Pujari Ki Dhani	2010-11	6.50	6.29	Solar Light Use for Lighting In Night	Useful for Lighting In Night	20
3	Solar Light (10)	27.761491	75.358330	Khojwas	Basawa	2010-11	2.50	2.42	Solar Light Use for Lighting In Night	Useful for Lighting In Night	12
4	Solar Light (12)	27.750717	75.358583	Barwa	Mohanwari	2010-11	3.00	2.91	Solar Light Use for Lighting In Night	Useful for Lighting In Night	15
5	Solar Light (22)	27.742045	75.405685	Todpura	Todpura	2010-11	5.50	5.33	Solar Light Use for Lighting In Night	Useful for Lighting In Night	28
6	Solar Light (29)	27.761083	75.428060	Girdharpura	Deva Ki Dhani	2010-11	7.03	7.02	Solar Light Use for Lighting In Night	Useful for Lighting In Night	35
	Total (113)						28.03	27.36			125

Source: Data received from PIA

Accordingly, a provision of **Rs. 28.03 lacs** was kept in the DPR for EPA works in this project and at the Final evaluation stage of the project **Rs. 27.36 Lacs** were utilized under EPA, which is **97.60%** financial achievement.

2.4 Utility:

In all, total **113 solar lights as EPA** works at different location were executed and all are being useful for the community. Details of EPA works as a whole are as under:

Fund utilization under EPA works

Table: 2.3

S. No.	EPA Type	No. of Works	Sanction Cost (in Rs.)	Fund Utilised(in Rs.)	Benefitted Families (in Nos.)	Executed in 2010-11 (Nos.)	Executed in 2011-12 (Nos.)
1	2	3	4	5	6	7	8
1.	Solar Light	113	28.03	27.36	125	113	0
	TOTAL	113	28.03	27.36	125	113	0

Source: Survey results of MEL&D agency Arpan

It is important that these activities; apart from other EPAs in other watersheds also, are not covered and permissible under the eligible investments in regular project activities or NRM activities, therefore with an objective of rapport building with the villagers & making the easy entry in project area, the importance of EPA can't be ignored.

Awareness about IWMP project activities and EPA works among the community was observed during discussion of impact assessment. It is reported that the activities are being vastly utilized for the purpose for which it was planned.

The important area to look into is the regular operation and maintenance of asset created like Solar Lights will be needed in due course of time to keep them useful sustainably.

2.5 Impact of Intervention:

It is reported that by and large the quality of all **113 EPA works constructed under the project is satisfactory to very good** and are serving the purpose.

It is also reported by the villagers/users that the purpose of EPA is very well met out, but at some places due to reluctance / negligence of the villagers or person responsible for the feeding the water into the asset, the asset was lying empty.

Impact of Intervention

Table: 2.4

S. No.	EPA Type	No. of Works	Benefitted Families (in Nos.)
1	2	3	4
1.	Solar Light	113	125
	TOTAL	113	125

Source: Survey results of MEL&D agency Arpan

2.6 Photo Gallery:

Some of the photographs of EPA collected along with location details are asunder:



CHAPTER –3

IEC, Participation and Community Mobilization

IEC and Training programmes conducted under IWMP:

To ensure the community participation in the project, annual Training plan was prepared by the PIA. As per the need of the project area and budgetary availability, suitable training are opted from the list of planned trainings by the concerning PIA.

3.1 IEC Activities:

The PIA has organized following activities under Information Education and Communication (IEC) to spread the awareness about the program. The key activities are:

- i. **Door to Door Campaigning:** During the preparatory phase, door to door campaign was carried out by the WDT and other project functionaries to convey the message that IWM Programme is launched in their village, it's objectives, important activities, likely benefits. They were also informed that why their involvement is necessary and they should take part in every activity i.e. orientation meeting, PRA, village meetings etc.
- ii. **Hamlet meeting/ meeting with disadvantages groups:** Social mapping cum screening of the beneficiary type wise, class-wise, hamlet wise demographic data of project area was done and in the initial stage, hamlet wise meeting of various class and disadvantaged groups were conducted. The objective was to orient them about the likely benefits i.e. opportunity of employments, to become SHG member and start thrift and income generating activities.
- iii. **Organization of village meetings:** Village-wise meetings were conducted in all project villages with the progressive farmers, PRI members, sarpanch, ward panch etc. again to inform about project mandate, activities etc. These meeting were quite useful in which problem identification, possible remedial measures, choice of activities were discussed.
- iv. **Wall Painting and Slogans writing at the common/public places:** To bring the awareness about the project in the local community wall paintings in **5 Gram Panchayat** were painted; depicting the important information about the project in the form of events/ activities, important dates, costs, provisions, phone numbers of contact person, map of the area, villages covered etc. as it is a common place where many of the farmers visits daily. It was helpful to bring awareness among the community.

In total, **500 Nara Lekhan Wall Painting & 5 Nukkad Natak (slogan Writing) activity** were carried out in all **6** villages of the project area. The slogans were able to transfer the spirit generating messages about soil and water conservation, importance of watershed treatment and outcomes etc.

On this activity total Fund of **Rs. 2.06 Lacs** was utilized benefitting all the families of the project area directly or in-directly.

Details of IEC activities at all 6 villages of 5 GP by PIA:

Table: 3.1

S. No.	Name of Activity	Physical Achievement (Nos.)	Fund Utilised (lacs)	Benefitted Families (Nos.)	Impact Status	
					Expected	Actual Impact
1	2	3	4	5	6	7
1	Nara Lekhan Wall Painting, Nukkad Natak	Nara Lekhan Wall Painting (500) Nukkad Natak (5)	2.06 Lacs	All families of entire watershed area	To bring awareness in the community	It has been helpful to bring awareness among the community

Source: Data received from PIA

V. Organization of Workshop/Trainings: Orientation workshop and various theme based workshops for specific target groups were organized at panchayat samiti, district & state level. The details of training activity are covered in the subsequent paras below.

VI. Exposure visits: The purpose of seven day exposure visit is very clear. In our state, country and abroad, many new interventions, best practices in the field of watershed development and management showing the impact of activity are carried out. On the principle of ‘**seeing is believing**’, the farmer were able to dream for themselves, adopt the sense of achievement, cross learning through discussions with the benefitted farmers of visiting places, and able to generate commitment for their own area or interventions. The people’s participation is also being taught & witnessed as without people’s participation and community mobilization, the success of watershed programme cannot be ensured.

In this watershed, one Interstate Exposure tour was conducted by the PIA. In this activity, total **100 beneficiaries** belonging to **100 families** were participated/benefitted. Out of 100 participants, **35 were male and 65 were female**. A sum of **Rs. 3.21 Lacs** was utilized in this activity

3.2 Meeting with WCDC, PIA, Chairman and members of watershed

Committee and community:

A number of meetings were conducted at District level with the Project Manager cum Superintending Engineer, Watershed Cell Cum Data Center (WCDC) Jhunjhunu, PIA, Navalgarh, Chairman and members of Watershed Committee (WC), Gram Panchayat and community for review the progress of watershed work done in the project area and to share their views about the implementation of IWMP Project.

For Social Audit purpose, monthly meetings of WC and community were organized and apart from reviewing the progress under various activities, other issues related with project implementation were discussed in the meetings.

3.3 Training Programmes:

Training Programs has-been organized by the PIA & PM WCDC to build up the capacity and development of skills to Office staff and WC members for planning, implementation and management of the Project.

Details of Training Conducted by PIA are given below:

Table:3.2

S. No.	Type of Training	No. of Trainings conducted(Nos.)	No. of Trainees participated (Nos.)		Expenditure Incurred (in Lacs)	Benefitted Families (Nos.)
			Male	Female		
1	2	3	4	5	6	7
1	Orientation Training	7	340	245	0.95	1350
2	Training of SHGs	6	218	113	0.69	615
3	WC/ Gram Panchayat personnel training	2	25	15	0.20	415
4	Skill Development Training	10	256	324	1.44	415
5	Training of UGs	1	14	26	0.07	50
6	Training of Farm Production measures	16	700	1325	6.31	2500
7	Training of Animal Husbandry	5	150	180	0.72	150
	Total for Training	47	1703	2228	10.37	5495
9	Interstate Exposure tour conducted & Places	1	35	65	3.21	100
10	Outstate Exposure tour conducted & Places	0	0	0	0	0
	Grand Total	48	1738	2293	13.58	5595

Source: Data received from PIA

In this watershed, total **48** different trainings and exposure visit activities were organized; out of which **47** were different types of trainings and **one** was Interstate exposure visit. Total **4031 persons** were benefitted in the training and exposure visit activity; of which **3931** were under training activity and **100** under exposure visit activity.

Further, total **1738 male** person were benefitted; of which **1703** were under training and **35** were under exposure visit and total **2293** female members were benefitted; of which **2228** were under training and **65** under exposure visit activity.

3.4 Financial Achievements:

As per DPR, a provision of **Rs. 35.04 Lacs** was kept under **Institution and Capacity Building Activity head** of the project against the total provision of **Rs. 700.80**. Out of which a sum of **Rs. 15.64 Lacs** was utilized during the project period, which is **44.63%** of approved provisions.

The expenditure of **Rs. 15.64 Lacs** comprises of **Rs. 10.37 Lacs** on Training activities, **Rs. 3.21 Lacs** on exposure visit and **Rs. 2.06 Lacs** on the IEC during the project period.

3.5 Impact of interventions:

The impact of these interventions can be seen in terms of the **active & increased participation** of community in the regular meeting of the project interventions. The formation of **User Groups and SHG** for the repair and maintenance of project interventions, collective way for thrift and income generation activities is initiated in the area. The active participation of community was seen in the formation and selection of **Watershed Development Committee** and **Secretary**. No. of farmers involved with agriculture and horticulture development activities increased. Farmers are **contributing their share** in the project activities. Their **decision making** on common issues has been increased. There is thorough discussion with in the groups for selecting the individual beneficiaries.



CHAPTER – 4

Process, People's Participation and Institutional Arrangements

4.1 Process:

The process for the institutional development was initiated with the entry point activities as a rapport building for the project staff. Continuous meetings were organized with the different stake holders for formation and selection of members in user groups and self-help groups. IWMP watershed projects focuses on systematic and sequential process which is adopted by the WD&SC Department in Rajasthan considering the Common Guidelines of GOI and other directions issued from time to time and same has been followed by the concerning PIA in Jhunjhunu IWMP -3-2009-10.

4.2 People's Participation:

People's participation in watershed management programmes is an important strategy of Government of India for making watershed programmes successful. People's participation is, however, not a new idea in India. In fact, it emerged long ago in the vision and actions of Tagore and Gandhi. Rural masses as development actors were the central feature of their rural reconstruction programmes.

It was found that in programme **planning stage**, the majority of farmers participated in planning meetings and they also motivated their fellow farmers to participate in planning meetings of watershed development. They also shared information & experience with their fellow farmers after participating in planning meetings. They actively participated in the PRA and DPR formation process. The entry point activities were also defined by them through the meetings.

In the **implementation stage**, majority of farmers contributed labor only towards construction of soil and water conservation structures in their fields and also asked their fellow farmers for contribution in the form of labor or cash towards construction of conservation structures in their watershed area. Their contribution was deposited in their watershed development fund.

In the **maintenance stage**, the majority of farmers of project area motivated to their fellow farmers for labor contribution towards repair and maintenance of soil and water conservation structures in their watershed and also protected the SWC structures from natural calamities as well as forest plantation from the animals. Further, it was also found that the farmers of project area have participated moderately in the watershed development programme planning and implementation stages, whereas, **high level of participation was exhibited by farmers in maintenance stage of watershed development programme**. Therefore, it could be concluded that the stakeholder farmers of project area participated more by contributing labor in maintenance of soil and water conservation structures implemented in their fields through government sponsored watershed development programmes to enhance their sustainable agricultural production due to more availability of irrigation water.

The programme should meet the daily requirements of the majority of the stakeholders like supply of drinking water, fodder for cattle and fuel for the kitchen. The watershed development programmes are made for local people; hence the local people should take interest and

participate also in implementation of programme by contributing labour and money in construction of soil and water conservation structures on their field and community land. Participation in **maintenance stage** is required because without protection and care by the local people the programme will not be successful. The involvement of local people in **programme evaluation** is also necessary, so that it may provide points to be considered for improvement in future programme planning.

4.3 Institutional Arrangements under IWMP:

The institutional arrangements for the project execution at community level followed in the District Jhunjhunu, Panchayat Samiti Navalgarh and watershed level are as under:

- State Level Nodal Agency and the Nodal Department
- Watershed Cell cum Data Center at District level
- Project Implementation Agency (PIA) at Panchayat Samiti Level
- 4 member Watershed Development Team (WDT) at the project level
- Watershed Development Committee (WDC)
- User Groups (UGs)
- Self Help Groups (SHGs)

4.3.1 WCDC and PIA in Jhunjhunu IWMP -3-2009-10:

In case of **Jhunjhunu IWMP -3/2009-10 Navalgarh** watershed project, the details are as under:

WCDC and PIA in Jhunjhunu IWMP -3-2009-10

Table: 4.1

Name of Project Manager, Watershed Cell cum Data Centre (PM WCDC)	Shri M.L. Barupal (SE)
Name of Project Implementing Agency (PIA) and supporting technical staff	Shri Manoj Kumar (XEN)
	Shri Naveen Rakesh Manju (AEN)
	Shri Arun Kumar (JEN)

Source: PIA & Survey results of MEL&D agency Arpan

4.3.2 Watershed Development Team in Jhunjhunu IWMP -3/2009-10:

Watershed Development Team in Jhunjhunu IWMP -3/2009-10

Table: 4.2

Name of Watershed Development Team (last Position)	Name of WDT
Engineering expert	Ramesh Sen
Agriculture expert	Rajesh Rohila
Veterinary expert	Rajesh
Social science expert	Daya Nand Meel

Source: PIA & Survey results of MEL&D agency Arpan

4.3.3 Self Help Groups (SHG):

As per the Common Guidelines, the Watershed Committee shall constitute SHGs in the watershed area with the help of WDT from amongst poor, small and marginal farmer households, landless/asset less poor agricultural laborers, women, shepherds and SC/ST persons. These Groups shall be **homogenous groups** having common identity and interest who are dependent on the watershed area for their livelihood. Each Self Help Group will be provided with a revolving fund of an amount to be decided by the Nodal Ministry. Total **105 SHGs** were formed in this cluster with **1050 members**.

Details of Self Help Groups in Jhunjhunu IWMP -3-2009-10:

Table: 4.3

Name of GP	Total No. of SHG formed	Total No. of SHG members	No. of SC/ST members	No of women members
1	2	3	4	5
Baswa	05	50	17	50
Mohanwari	10	100	35	100
Todpura	28	280	97	280
Tonk Chilri	20	200	85	200
Deva ki Dhani	22	220	74	220
Pujari Ki dhani	20	200	87	200
Total	105	1050	395	1050

Source: PIA & Survey results of MEL&D agency Arpan

4.3.5 User Groups (UG):

As per the Common Guidelines, the Watershed Committee (WC) shall also constitute User Groups in the watershed area with the help of WDT. These shall be **homogenous groups** of persons most affected by each work/ activity and shall include those **having land holdings** within the watershed areas. Each User Group shall consist of those who are likely to derive direct benefits from a particular watershed work or activity. The WC with the help of the WDT shall facilitate resource-use agreements among the User Groups based on the principles of **equity and sustainability**. These agreements must be worked out before the concerned work is undertaken. It must be regarded as a pre-condition for that activity. The User Groups will be responsible for the operation and maintenance of all the assets created under the project in close collaboration with the Gram Panchayat and the Gram Sabha. Total **24 UGs** were formed in this cluster with **242 members**.

4.3.5.1 Details of User Groups in Jhunjhunu IWMP -3-2009-10:

Details of User Groups in Jhunjhunu IWMP -3-2009-10:

Table: 4.4

Name of GP	Total No. of UG formed	Total No. of UG members	No. of SC/ST members
1	2	3	
Baswa	04	40	8
Pujari ki Dhani	04	40	9
Deva Ki Dhani	04	40	7
Todpura	04	40	9
Tonk Chilri	04	40	8
Mohanwari	04	42	8
TOTAL	24	242	49

Source: PIA & Survey results of MEL&D agency Arpan

4.3.6 Watershed Committee (WC):

Total 6 WCs were formed in this cluster with 81 members.

4.3.6.1 Details of Watershed Committee (WC) in Jhunjhunu IWMP -3/2009-10:

Details of Watershed Committee in Jhunjhunu IWMP -3-2009-10:

Table: 4.5

S. No.	Name of Watershed Committee	WC Chairman Name & Mobile No.	Name of Secretary	Total Member	No. of SC/ST member	No. of women member	Date of formation	WC Account No. and Bank Name
1	2	3	4	5	6	7	8	9
1	Basawa	Manesh Kumar	Nemi Chand	13	06	03	05/03/10	61126920012 sbi basawa
2	Mohanwari	Raghuveer Singh	Sankar Singh	13	2	3	06/03/10	61126920090 sbi basawa
3	Pujari ki Dhani	Nardu Singh	Mukesh kumar	15	2	1	05/04/10	61126919846 sbi basawa
4	Tonk Chilri	Tarachand Bhat	Narender Kumar	14	2	03	05/03/10	61126919915 sbi basawa
5	Todpura	Pankaj Kumar	Mohan Singh	13	02	04	05/04/10	61126919788 sbi basawa
6	Deva ki Dhani	Rajesh Devi	Jitnder Kumar	13	03	04		
	Total			81	17	18		

Source: PIA & Survey results of MEL&D agency Arpan

4.4 Impact of Interventions:

With the institutionalization of system as mentioned above, following impacts in Jhunjhunu IWMP -3/2009-10 watersheds were observed:

- Regular meeting of WDC
- Decision making in day to day execution of work by the WDC
- Updating of committee level records by the committee itself
- Repair and maintenance of the project interventions by the user groups
- Actively women participation through SHG in all project activities

4.5 Photo Gallery:



CHAPTER – 5

Natural Resource Management

5.1 Soil and Water Conservation measures under taken:

Under Natural Resource Management (NRM) works component of the IWMP, following Soil and Water Conservation measures were taken as under:

Soil and Water Conservation measures under taken through IWMP:

Table: 5.1

S. No.	Name of Activity	Unit	Target for the project period		Total achievement up to end of project period		Percentage achievement	
			Phy	Fin	Phy	fin	Phy	Fin
1	2	3	4	5	6	7	8	9
(i)	Land Development (Productive use)							
	(a) Afforestation	Ha.	-	-	-	-	-	-
	(b) Horticulture	Ha.	-	-	5	1.99	-	-
	(c) Pasture Development*	Ha.	8	22.20	-	-	-	-
(ii)	Soil and Moisture Conservation							
	(a) Field Bunds	Ha	806	80.60	2.61	26.11	3.24	32.39
(iii)	Vegetative & Engineering Structure							
	(a) Gully Plugs	Nos.	-	-	-	-	-	-
	(b) Anicut	Nos.	-	-	-	-	-	-
	(c) Earthen Bund	Nos.	-	-	-	-	-	-
	(d) CCT & DCCT	Nos.	-	-	-	-	-	-
	(e) MPT	Nos.	-	-	-	-	-	-
	(f) Waste Weir	Nos.	-	-	-	-	-	-
(iv)	Water Harvesting Structure (New created)							
	(a) Earthen Check Dam	Nos.	-	-	-	-	-	-
	(b) Nallah Bunds	Nos.	-	-	-	-	-	-
	(c) Others (Talai & WHS)	Nos.	15	125.00	547	394.7	437.60	315.76
	(d) Farm Pond	Nos.	207	192.68	-	-	-	-
	(e) Pakka Talab	Nos.	-	-	1	5	-	-
	Total			420.48		427.80		101.74

Source: DPR, PIA & Survey results of MEL&D agency Arpan

Soil and Water Conservation measures under taken through convergence:

Table: 5.2

STATUS OF COMPLETED SOIL AND WATER CONSERVATION MEASURES THROUGH CONVERGENCE IN ALWAR IWMP 3			
S.No.	Particulars	No. of activity	Financial Expenditure (in lacs)
A	Forest Department	2	1.212
	Non Arable		
	Vraksh Kunj	2	1.212
B	Panchayati Raj	10	80.496
	Non Arable		
	Talai (Talab)	3	44.112
	Diversion Channel/Feeder	2	14.841
	Other Department		
	Recharging Shaft for Aquifers	2	19.448
	Roof Top Water Harvesting Structure	3	2.095
C	Rural Development	1	4.589
	Non Arable		
	Water-Harvesting		
	Talai (Talab)	1	4.589
	Grand Total	13	86.297

Source: PIA & Survey results of MEL&D agency Arpan

Above tables 5.1 & 5.2 reveals that expenditure being incurred through IWMP i.e. Rs. 427.80lacs (101.74%) are more than planned as per DPR. Apart from such expenditure incurred in soil and water conservation measures through IWMP, about Rs. 86.297 lacs more incurred through convergence of different government department in Jhunjhunu IWMP_3. As result of it, the financial achievement against the targeted amount is in actually achieved more **through convergence**.

5.2 Impact of interventions:

It is observed that major expenditure in Jhunjhunu IWMP_3/2009-10watersheds is done on field bunds on farmers' fields, Talai and WHS reduces water runoff and controls soil erosion.Based on the data provided by the PIA during final impact assessment, it was observed that with the implementation of various NRM activities in the farmers' fields, the water harvesting/recharging is done and the harvested water is used by the nearby farmers to irrigate the crops directly by pumping at few places, but largely it had contributed in ground water recharge, rising of water table of the wells and making the use of additional water in crop production.

Impact of Soil and Water Conservation measures under taken:

Table: 5.3

S. No.	Activity	Unit	Physical progress	Total Storage capacity (in Thousands CUM)	Total benefitted families (Nos.)
1	2	3	4	5	6
1.	Field Bunds	Ha.	26.11	41	105
2.	Checks and Plugs	Nos.	-	-	-
3.	Anicut	Nos.	-	-	-
4.	Earthen Bund	Nos.	-	-	-
5.	CCT & DCCT	Nos.	-	-	-
6.	MPT	Nos.	-	-	-
7.	West Wear	Nos.	-	-	-
8.	Earthen Check Dams	Nos.	-	-	-
9.	Nallah Bunds	Nos.	-	-	-
10.	Others (Talai & WHS)	Nos.	547	1960	3523
	Total			2001	3628

Source: PIA & Survey results of MEL&D agency Arpan

It is evident from the above table that total capacity of rain water harvesting of all NRM activities in the IWMP watershed is **2001 Thousands CUM**. With the implementation of watershed activities, total **3628** families have been benefitted through various activities.

Major impact of this intervention is as under:

- In-situ moisture and water conservation
- Safe disposal of excess rain water
- Reduction in soil erosion
- Reduction in flooding as zigzag construction increase the travelling length of rain water
- Increases time of percolation of water in the soil in upper land
- Safety of bund to breaches due to heavy rain
- Change in cropping pattern.
- Impact on agricultural productivity as the time of moisture retentions is increased
- Impact on soil deposition/conservation of topsoil.
- Impact on net economic benefit.
- Impact on migration.

5.3 Summary:

This watershed area is characterized by undulated terrain with majorly loamy and sandy loam soils. The area has tremendous potential of Agriculture and Horticulture production with nearby market facilities to Jhunjhunu region. As water availability in the farmers' fields is very important to enable him to take up emergency irrigation during dry spells in Kharif season and also second crop during Rabi season. The soil and water conservation measure along with small

water harvesting structures (earthen) are quite useful in this area. This has resulted in additional area under irrigation as well as increase in productivity. This is linked with the farmer's income.

Under the project, some deviations within the financial ceilings have been made in the activities implemented as against the DPR provisions, which were initially kept. Perhaps, that would be due to actual requirement of project area and farmers views and needs.

5.4 Photo Gallery:



CHAPTER –6

Agriculture and Horticulture Development

6.1 Activities undertaken:

Following activities were taken up under Agriculture & Horticulture Development in Jhunjhunu IWMP-3 (2009-10) Project:

Agriculture & Horticulture Development Activities undertaken:

Table: 6.1

S. No.	Name of Activity	Unit	Target for the project period		Total achievement up to project end		Percentage achievement	
			Phy	Fin	Phy	Fin	Phy	Fin
1	2	3	4	5	6	7	8	9
1	Crop Demonstration & Fertilizer	Nos.	-	-	694	15.59	-	-
1(a)	Seed	Nos.	-	-	-	-	-	-
1(b)	Fertilizer	Nos.	-	-	-	-	-	-
2	Chaff Cutter	Nos.	-	-	50	3.55	-	-
3	Vermin Compost Units	Nos.	-	-	-	-	-	-
	Total			49.06	744	19.14		39.02%

Source: PIA & Survey results of MEL&D agency Arpan

STATUS OF COMPLETED AGRICULTURE & HORTICULTURE DEVELOPMENT ACTIVITIES THROUGH CONVERGENCE IN JHUNJHUNU IWMP 3			
S.No.	Particulars	No. of activity	Financial Expenditure (in lacs)
A	Agriculture Department	22	1.80
	Arable		
	Micro Irrigation System		
	Pipeline	3	0.18
	Sprinkler	19	1.62
B	Horticulture	3	1.45
	Arable		
	Micro Irrigation System		
	Sprinkler	3	1.45
	Grand Total	25	3.25

Source: PIA & Survey results of MEL&D agency Arpan

As against the total project cost of Jhunjhunu IWMP -3/2009-10 watershed, of **Rs. 700.80 Lacs**, provision for Production System and Micro-enterprises component (Agriculture & Horticulture Development) was kept as **Rs. 49.06 Lacs**. During the project period total expenditure on Production System and Micro-enterprises component activities was reported **Rs 19.14 Lacs**, which is **39.02%** against the targeted amount. While considering the funds being utilized through convergence is **Rs. 3.25** lacs in IWMP -3 and as a result of it total **Rs. 22.39** lacs has been incurred in IWMP 3.

The details of project beneficiaries types and beneficiaries contribution in WDF collected in the activities completed under this head are as under:

Beneficiaries' types and beneficiaries contribution in WDF:

Table: 6.2

S. No	Name of Activity	Nos. of Beneficiaries					WDF Amount (Rs. in Lacs)					Total Expenditure (Rs. in Lacs)
		SC	ST	OBC	Gen	Total	SC	ST	OBC	Gen	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Crop Demonstration	88	26	168	412	694	0.20	0.058	0.75	1.85	2.86	15.59
2	Chaff Cutter	10	4	14	22	50	0.07	0.028	0.15	0.23	0.48	3.55
	Total	98	30	182	434	744	0.27	0.086	0.90	2.08	3.34	19.14

Source: PIA & Survey results of MEL&D agency Arpan

Total benefitted beneficiaries under **Production System and Micro-enterprises component** were **744** Nos. **694** under Crop Demonstration & Chaff Cutter Distribution activity and out of it **50** under Chaff Cutter,.

The beneficiaries have contributed a sum of **Rs. 3.34 Lacs** as their contribution and the entire amount has been deposited in WDF account.

6.2 Impact of interventions:

After activities taken up under Agriculture & Horticulture Development in Jhunjhunu IWMP-3 (2009-10) Project, following impacts were identified in the project area

6.2.1 Change in Cropping Pattern - Total Cultivation Land, Irrigated Area & Cropped area in IWMP Watershed & Control Area (ha/%):

Cropping Pattern - Total Cultivation Land, Irrigated Area & Cropped area in IWMP Watershed & Control Area (ha/%):

Table:6.3

IWMP/ Control Area	Timeline	Total Cultivation Land			Total Irrigated Area			Total Cropped Area		
		Kharif	Rabi	Jayad	Kharif	Rabi	Jayad	Single Crop	Double Crop	Multiple Crop
1	2	3	4	5	6	7	8	9	10	11
IWMP-3 /2009-10	Base line	1885	375	105	185	225	105	1510	480	105
	End line	2285	405	112	235	285	112	1880	517	112
	Impact / change (ha)	400	30	7	50	60	7	370	37	7
	Impact / % change	21.22	8.00	6.67	27.03	26.67	6.67	24.50	7.71	6.67
Control area	Base line	1905	405	107	198	230	107	1500	512	107
	End line	1985	421	110	211	245	110	1564	531	110
	Impact / change (ha)	80	16	3	13	15	3	64	19	3
	Impact / % change	4.20	3.95	2.80	6.57	6.52	2.80	4.27	3.71	2.80

Source: Survey results of MEL&D agency Arpan

It is observed during the end line survey that **21.22%** Kharif, **8%** Rabi and **6.67%** Jayad cultivation area is increased in watershed area as compared to **4.20%** Kharif, **3.95%** Rabi and **2.80%** Jayad in Control area. Increase in Single, Double and multiple crop area is **24.50%**, **7.71%** and **6.67%** respectively in watershed area as compared to **4.27%**, **3.71%** and **2.80%** in control area. It shows a positive impact.

6.2.2 Season/Crop-wise area in IWMP Watershed & Control Area (ha/%):

Season-wise & Crop-wise area in IWMP Watershed % Control Area (ha/%):

Table:6.4

IWMP/ Control Area	Timeline	Kharif			Rabi			Jayad	% irrigated area to total cultivation area		
		Bajra	Others	Total	Wheat	Others	Total	Total	Kharif	Rabi	Jayed
IWMP – 3/2009/10	Base line	1015	870	1885	275	100	375	105	9.81	60.00	100.00
	EndLine	1250	1035	2285	300	105	405	112	10.28	70.37	100.00
	Impact change	235	165	400	25	5	30	7	0.47	10.37	0.00
	Impact % change	23.15	18.97	21.22	9.09	5.00	8.00	6.67	0.47	10.37	0.00
Control area	Base line	1020	885	1905	285	120	405	107	10.39	56.79	100.00
	EndLine	1080	905	1985	298	123	421	110	10.63	58.19	100.00
	Impact change	60	20	80	13	3	16	3	0.24	1.40	0.00
	Impact % change	5.88	2.26	4.20	4.56	2.50	3.95	2.80	0.24	1.40	0.00

Source: Survey results of MEL&D agency Arpan

It is observed that cropped area in Bajra is increased by **23.15%**, and Wheat by **9.09%** in watershed area as compared to **5.88%** in Bajra, and **4.56%** in Wheat in control area. Likewise % irrigated area to total cultivation area is also increased by **0.47%** in Kharif and **10.37%** in Rabi in watershed area as compare to control area where Kharif increased by **0.24%** and Rabi increased by **1.40%**.

6.2.3 Average Crop Yield/Productivity and Use of Organic Manure in IWMP Watershed & Control Area (Ton/ha & %):

Average Crop Yield / Productivity and Use of Organic Manure in IWMP Watershed & Control Area (Ton/ha & %):

Table:6.5

IWMP/ Control Area	Timelin e	Season	Crop Type	Average Crop productivity Ton Per Ha.	Use of Organic Manures (%)	
					Compost	Vermi Compost
IWMP – 3/2009- 10	Base Line	Kharif	Bajra	0.35	93.00	3.00
			Gwar	1.10	95.00	4.00
			Chawla	1.20	94.00	3.18
		Rabi	Wheat	2.00	97.00	4.00
			Barely	1.70	96.00	3.00
			Gram	1.80	96.00	3.00
		Jayad	Moong	0.85	97.00	5.50
	EndLine	Kharif	Bajra	0.65	95.00	5.00
			Gwar	1.42	97.00	6.00

IWMP/ Control Area	Timelin e	Season	Crop Type	Average Crop productivity Ton Per Ha.	Use of Organic Manures (%)		
					Compost	Vermi Compost	
Control Area	Impact (A)% change	Rabi	Chawla	1.47	96.00	5.00	
			Wheat	2.32	99.00	6.00	
			Barely	1.85	99.00	5.50	
		Jayad	Gram	1.98	99.00	4.00	
			Moong	1.05	98.00	8.00	
			Bajra	0.30	2.00	2.00	
		Kharif	Gwar	0.32	2.00	2.00	
			Chawla	0.27	2.00	1.82	
			Wheat	0.32	2.00	2.00	
		Rabi	Barely	0.15	3.00	2.50	
	Gram		0.18	3.00	1.00		
	Moong		0.20	1.00	2.50		
	Control Area	Base Line	Kharif	Bajra	0.30	92.00	2.00
				Gwar	1.05	94.00	3.00
				Chawla	1.15	93.00	2.00
Rabi			Wheat	1.95	95.00	3.50	
			Barely	1.65	96.00	3.75	
			Gram	1.75	96.00	3.75	
Jayad			Moong	0.75	97.00	4.50	
EndLine			Kharif	Bajra	0.40	95.00	3.00
				Gwar	1.15	96.00	4.00
		Chawla		1.20	97.00	4.50	
		Rabi	Wheat	2.01	98.00	5.00	
			Barely	1.78	99.00	5.00	
			Gram	1.87	98.00	5.00	
Jayad		Moong	0.84	98.00	5.50		
Impact (A)% change		Kharif	Bajra	0.10	3.00	1.00	
	Gwar		0.10	2.00	1.00		
	Chawla		0.05	4.00	2.50		
	Rabi	Wheat	0.06	3.00	1.50		
		Barely	0.13	3.00	1.25		
		Gram	0.12	2.00	1.25		
	Jayad	Moong	0.09	1.00	1.00		

Source: Survey results of MEL&D agency Arpan

6.3 Summary of important impacts:

- Productivity of major crops has been increased almost in all the crops i.e. wheat, Bajra, Mustard, Gwar etc due to adoption of improved package of practices.
- Use of compost and vermin compost is increased in watershed area as compared to the control area.
- Area under horticulture crop has been increased and the incomes of farmers have also been increased.
- Net profit from the agriculture and horticulture has been increased.

- Productivity of animal has been increased due to improved fodder techniques i.e. distribution of Chaff Cutter, mangers etc.

6.4 Photo Gallery:



CHAPTER –7

Livelihood Interventions

7.1 SHG formulated and Revolving Fund generated:

As per project guidelines, a sum Rs. 25,000/- to each eligible SHG can be given and thus, total **18 (6 SHGs and 12 Individual beneficiary)** were benefitted with total amount of **Rs. 4.50 Lac.**

7.2 Adopted Livelihood activities:

Livelihood Support System: The total cost of Project is **Rs. 700.80 Lacs**. The financial provision for the Livelihood Support System was kept as **Rs 56.06 Lacs**. Out of that, at the Final evaluation stage, a sum of **Rs. 4.50 Lacs** has been utilized as reported by the PIA, which is **8.03 %** of **Rs 56.06 Lacs** total sanctioned amount. Out of **Rs. 4.50 Lacs**, **Rs. 1.50 Lacs** is utilized by providing revolving fund to **6 SHGs** and **Rs. 3.00 Lacs** has been utilized to benefit **12 individual beneficiaries** by giving revolving fund up to **Rs. 0.25 Lacs / individual beneficiary**. Details of SHG & Individual beneficiary-wise progress are as under:

7.2.1 Progress of SHG and revolving fund

Details of SHG and revolving fund

Table: 7.1

S. No.	Name of SHG	Village	Total Member	Seed Money given (Rs.)	Present Status (Working Y/N)
1	2	3	4	5	6
1	Jay Santoshi Mata	Tokchalri	10	25000	Yes
2	Jagdamba Mata	Tokchalri	10	25000	Yes
3	Balaji	Tokchalri	10	25000	Yes
4	Parwati	Pujari ki Dhani	10	25000	Yes
5	Seeta	Pujari ki Dhani	10	25000	Yes
6	Kamdhenu	Pujari ki Dhani	10	25000	Yes
	TOTAL		60	150000	

Source: From concerning PIA

7.2.2 Progress of Individual Beneficiary Activities:

Details of Individual Beneficiary Activities

Table: 7.2

S. No.	Name of Entrepreneur	Business / Purpose	Village	Assistance Provided as seed money (Rs.)	Present Status (Working Y/N)
1	2	3	4	5	6
1	Vijandra / Dalip Singh	Dairy	Tokchalri	25000	Yes
2	Kuldeep Singh	Electrical	Tokchalri	25000	Yes
3	Guman Singh / Surjaram	Dairy	Tokchalri	25000	Yes
4	Sunil / Guman Singh	Chaff Cutter	Tokchalri	25000	Yes

S. No.	Name of Entrepreneur	Business / Purpose	Village	Assistance Provided as seed money (Rs.)	Present Status (Working Y/N)
1	2	3	4	5	6
5	Prahlad /Surjaram	Bakri Palan	Pujari ki Dhani	25000	Yes
6	Mamram / Futturam	Selai Kala	Pujari ki Dhani	25000	Yes
7	Geega Ram /Ganesh Ram	Dairy	Pujari ki Dhani	25000	Yes
8	Kailash / Jaguram Sain	Nai Ki Dukan	Todpura	25000	Yes
9	Kamla Meena	Bakri Palan	Todpura	25000	Yes
10	Damodar Prasad / Bihari Yogi	Pig palan	Todpura	25000	Yes
11	Hari Ram / Lechami Ram	Dairy	Todpura	25000	Yes
12	Pratap Saini /Jugalkishor Saini	Electrical	Todpura	25000	Yes
Total				300000	

Source: From concerning PIA

7.3 Impact of Intervention:

The revolving fund @ Rs. 25,000/- was provided to the **18 (6 SHGs and 12 Individual beneficiaries)** for carrying out their own selected income generating activities to support their livelihoods. These activities are grocery shop, stitching, goat rearing, dairy etc.

Out of total **12** individual beneficiaries benefitted under the project, **4 with Dairy, 2 with Electrical shop and 1 with Chaff Cutter, 2 Bakri Palan, 1 Selai Kala, 1 (Barbar) Nai Ki Dukan, 1 Pig palan.** They are getting their livelihoods now with the support of project.

7.4 Summary:

To provide livelihood support to an un-employed youth or revolving fund to the SHGs is a big mile stone for bringing the community up front and making them **self-reliant and self-confident**. The uniqueness of watershed development project is that it takes care and ensures integrated development of a hydrological area in the form of creation of assets both at the farmer's field, common lands and also support for the land less, women and marginalized people of the society. The results are very good as these benefitted families now able to meet the requirement of the family members, thus up-lifting the living status.

7.5 Photo Gallery:



CHAPTER –8

Impact of Watershed Intervention

8.1 Water:

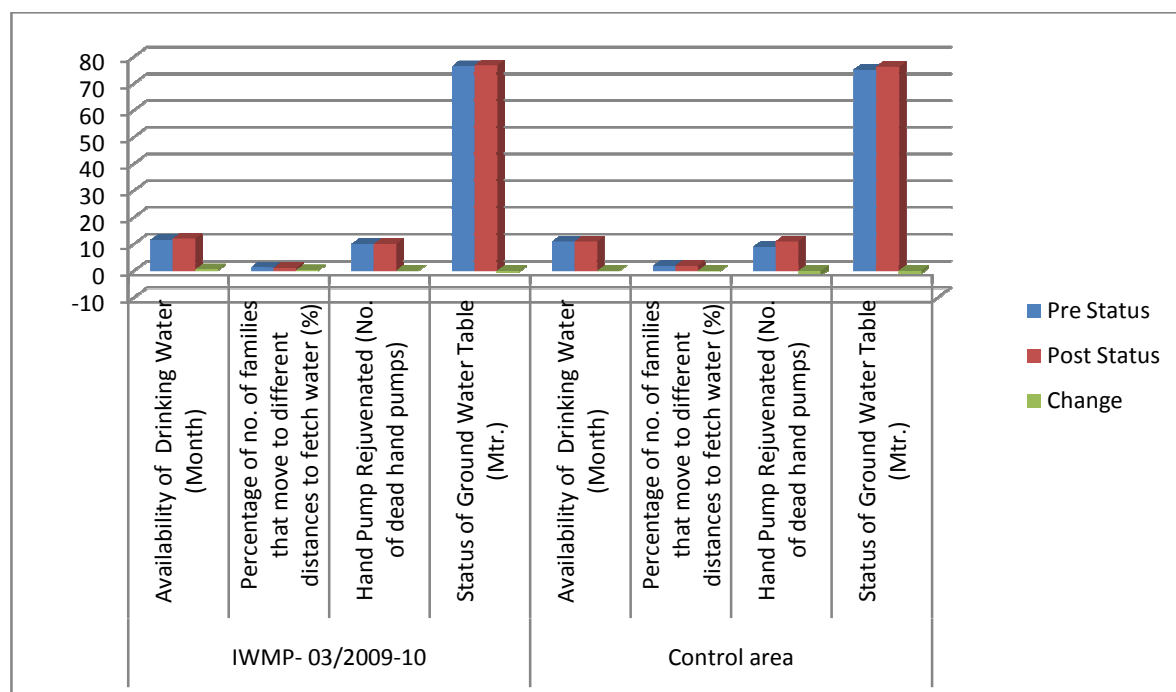
8.1.1 Availability of drinking water for human being and cattle:

Status of Drinking Water:

Table:8.2

S. No.	IWMP/ Control Area	Indicator	Pre Status	Post Status	Change
1	2	3	4	5	6
1	IWMP- 03/2009- 10	Availability of Drinking Water (Month)	11.5	12	0.5
2		Percentage of no. of families that move to different distances to fetch water (%)	1.25	1.05	0.2
3		Hand Pump Rejuvenated (No. of dead hand pumps)	10	10	0
4		Status of Ground Water Table (Mtr.)	76.41	76.81	-0.4
1	Control area	Availability of Drinking Water (Month)	11	11	0
2		Percentage of no. of families that move to different distances to fetch water (%)	1.75	1.9	-0.15
3		Hand Pump Rejuvenated (No. of dead hand pumps)	9	11	-2
4		Status of Ground Water Table (Mtr.)	75.16	76.29	-1.13

Source: Survey results of MEL&D agency Arpan



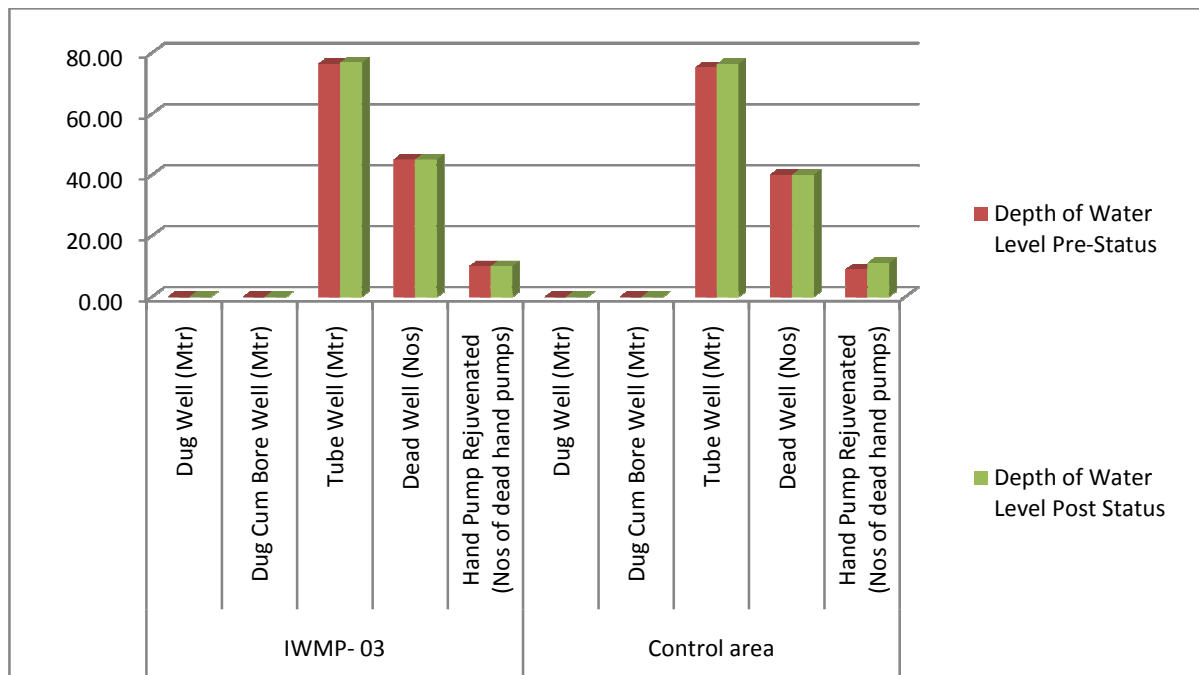
8.1.2 Status of Ground Water Table:

Status of Ground Water Table (Watershed Level)

Table:8.2

S. No.	IWMP/ Control Area	Type (Wells)	Depth of Water Level Pre-Status	Depth of Water Level Post Status	Change
1	2	3	4	5	6
1	IWMP-03	Dug Well (Mtr)	0.00	0.00	0.00
2		Dug Cum Bore Well (Mtr)	0.00	0.00	0
3		Tube Well (Mtr)	76.41	76.81	-0.4
4		Dead Well (Nos)	45	45	0
5		Hand Pump Rejuvenated (Nos of dead hand pumps)	10	10	0
1	Control area	Dug Well (Mtr)	0.00	0.00	0.00
2		Dug Cum Bore Well (Mtr)	0.00	0.00	0
3		Tube Well (Mtr)	75.16	76.29	-1.13
4		Dead Well (Nos)	40	40	0
5		Hand Pump Rejuvenated (Nos of dead hand pumps)	9	11	-2

Source: Survey results of MEL&D agency Arpan



8.1.3 Number of Water Resources Rejuvenated:

Number of Surface Storage Structures created:

Table: 8.3

S. No.	Name of Activity	Unit	Target for the project period		achievement through IWMP		Achievement through Convergence		Total achievement	
			Phy	Fin	Phy	Fin	Phy.	Fin.	Phy.	Fin.
1	2	3	4	5	6	7	8	9	10	11
1	Farm Pond	Nos.	207	192.68	0	0	0	0	0	0
2	Others (WHS)	Nos.	15	125.00	547	394.7	0	0	547	394.7
3	Talai/ Talab	Nos.	0	0	1	5	4	48.70	5	53.70
4	Diversion Channel/Feeder	Nos.	0	0	0	0	2	14.84	2	14.84
5	Recharging Shaft for Aquifers	Nos.	0	0	0	0	2	19.45	2	19.45
6	Roof Top Water Harvesting Structure	Nos.	0	0	0	0	3	2.09	3	2.09
	Total			317.68		399.7		85.08	559	484.78

Source: PIA and Survey results of MEL&D agency Arpan

In this watershed, **559** different types of water storage/harvesting structures were created with an investment of **Rs. 484.78 Lacs**.

8.2 Land Use/ Land Cover (Agriculture):

8.2.1 Area under Cultivation (Kharif, Rabi and Jaid)

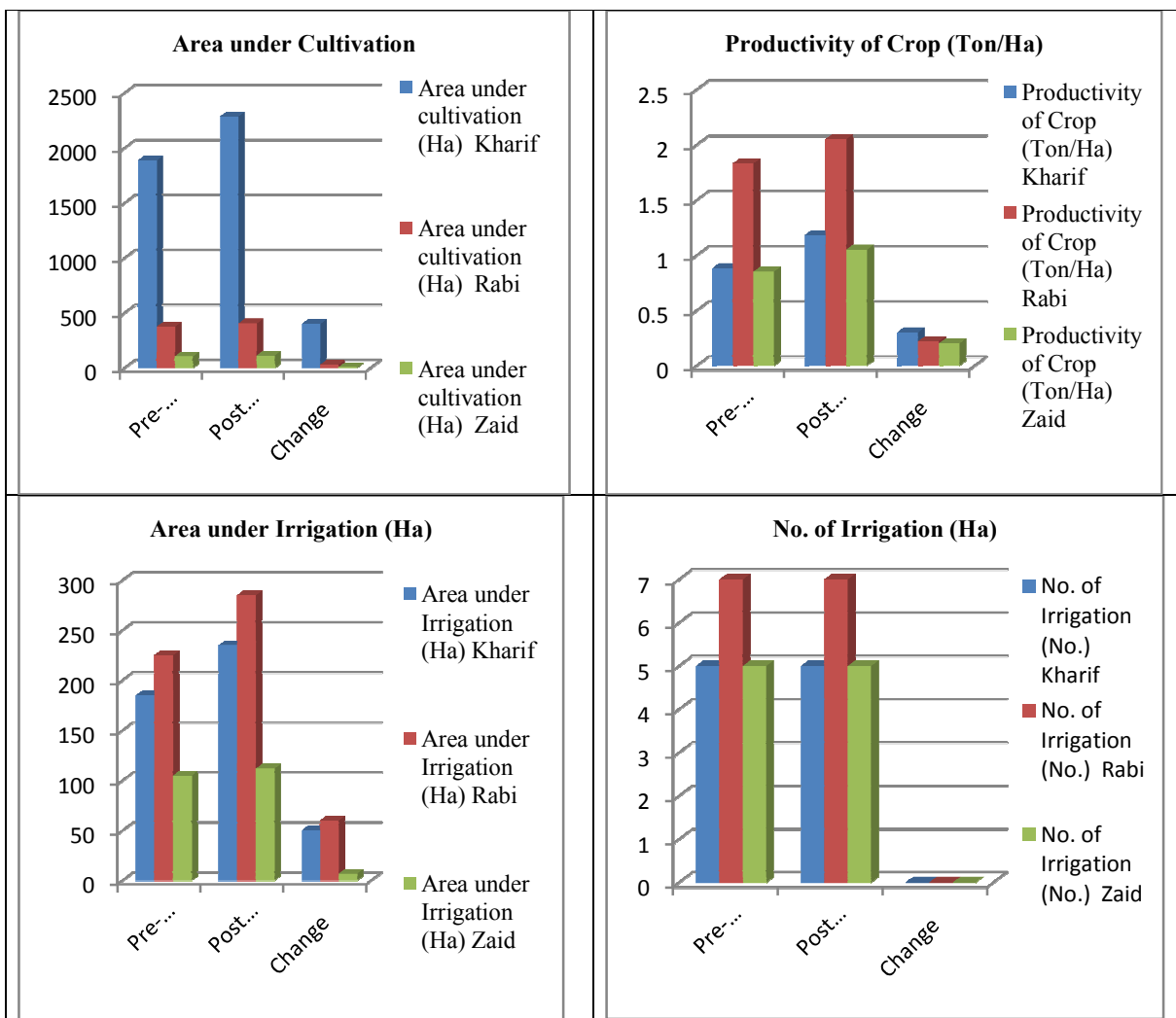
Changes in Agriculture observed during ground-based base line/ end line survey:

Table:8.5

S. No.	Indicators	Pre-Status	Post Status	Change	
1	2	3	4	5	
IWMP – 3/ 2009-10	Area under cultivation (Ha)	Kharif	1885	2285	400
		Rabi	375	405	30
		Zaid	105	112	7
	Productivity of Crop (Kg/Ha)	Kharif	0.88	1.18	0.3
		Rabi	1.83	2.05	0.22
		Zaid	0.85	1.05	0.2
	Area under Irrigation (Ha)	Kharif	185	235	50
		Rabi	225	285	60
		Zaid	105	112	7
No. of Irrigation (No.)	Kharif	5	5	0	
	Rabi	7	7	0	
	Zaid	5	5	0	
Control Area	Area under cultivation (Ha)	Kharif	1905	1985	80
		Rabi	405	421	16

S. No.	Indicators	Pre-Status	Post Status	Change	
1	2	3	4	5	
	Productivity of Crop (Kg/Ha)	Zaid	107	110	3
		Kharif	0.83	0.92	0.09
		Rabi	1.78	1.89	0.11
	Area under Irrigation (Ha)	Zaid	0.75	0.84	0.09
		Kharif	198	211	13
		Rabi	230	245	15
	No. of Irrigation (No.)	Zaid	107	110	3
		Kharif	5	5	0
		Rabi	7	7	0
	Zaid	5	5	0	

Source: Survey results of MEL&D agency Arpan



Changes in Agriculture observed as per remote sensing & GIS based findings:

Table:8.6

Land use Class	Area Pre (Ha)	Area Post (Ha)	Difference (Ha)
Agriculture	1074.658	1196.930	122.27

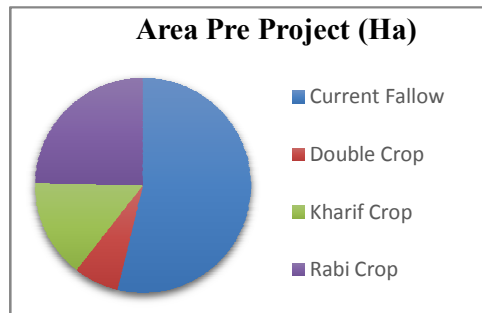
Source: GIS Report by MEL&D agency

(A) Pre Classification of Crop Land

Table:8.7

Land use Class	Area (Ha)	Area (%)
1	2	3
Current Fallow	668.627	62.218
Double Crop	84.276	7.842
Kharif Crop	183.393	17.065
Rabi Crop	306.912	28.559

Source: GIS Report by MEL&D agency

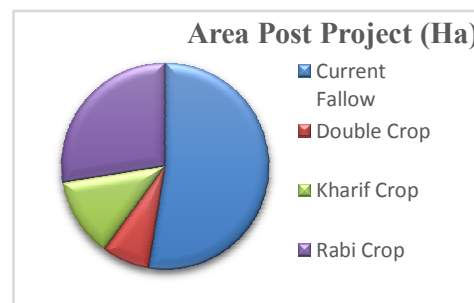


(B) Post Classification of Crop Land

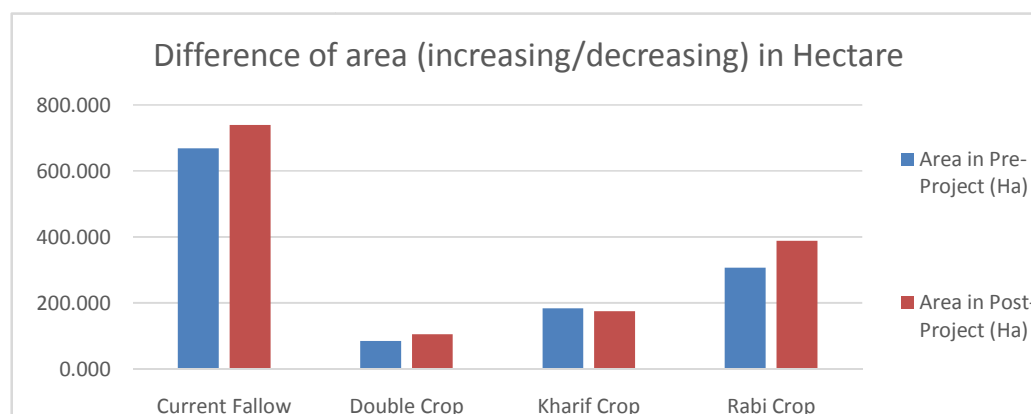
Table:8.8

Land use Class	Area (Ha)	Area (%)
1	2	3
Current Fallow	739.431	61.777
Double Crop	104.774	8.754
Kharif Crop	174.526	14.581
Rabi Crop	387.748	32.395

Source: GIS Report by MEL&D agency

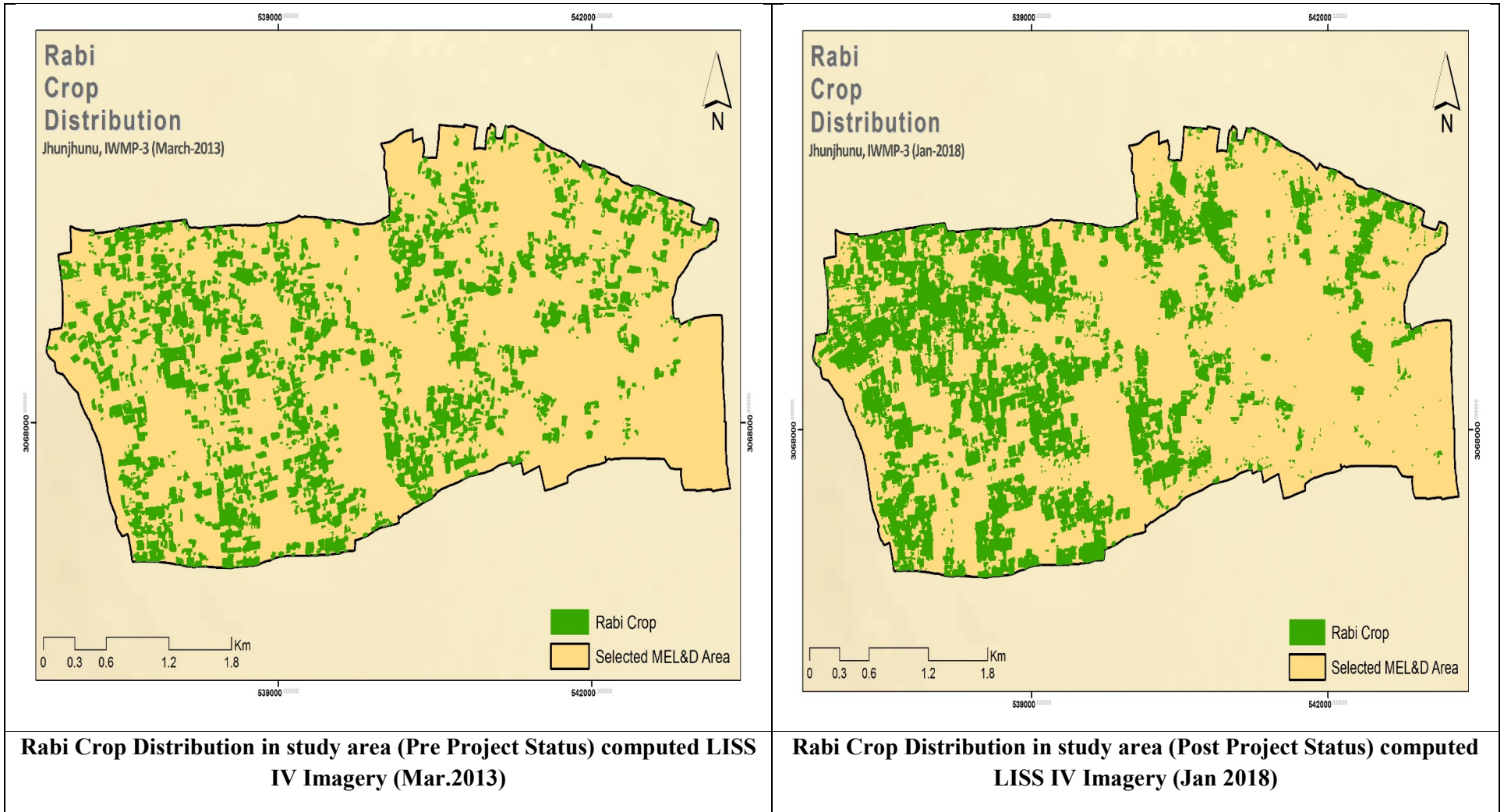


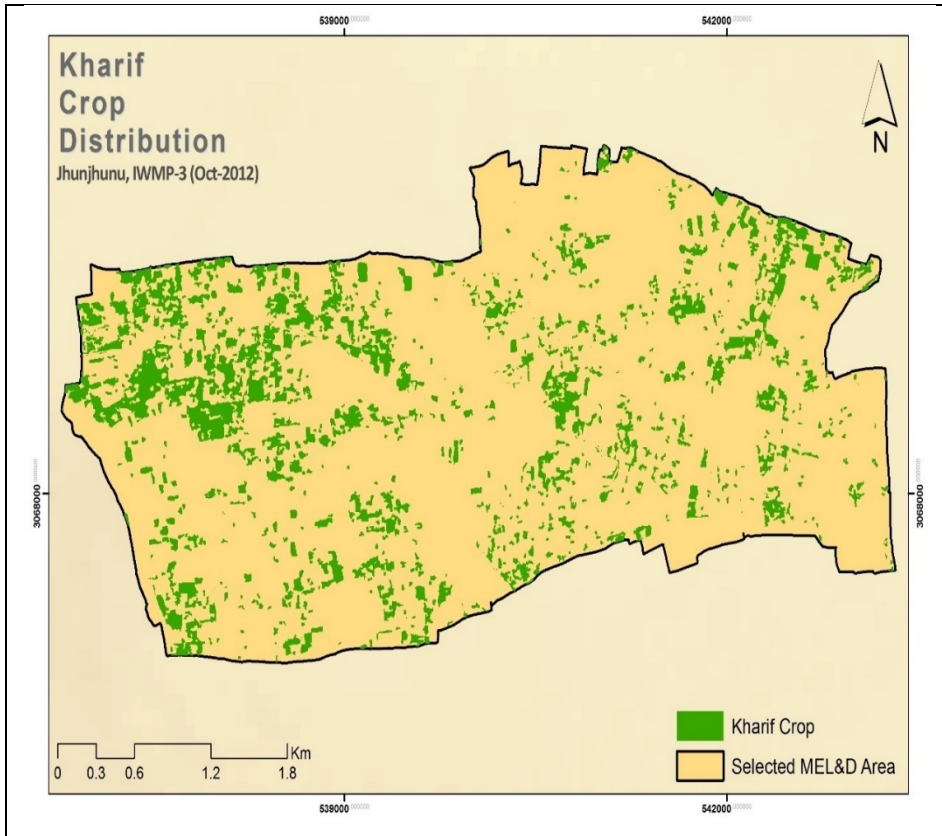
Land use Class	Area Pre (Ha)	Area Post (Ha)	Difference (Ha)
1	2	3	4
Current Fallow	668.627	739.431	70.80
Double Crop	84.276	104.774	20.50
Kharif Crop	183.393	174.526	-8.87
Rabi Crop	306.912	387.748	80.84



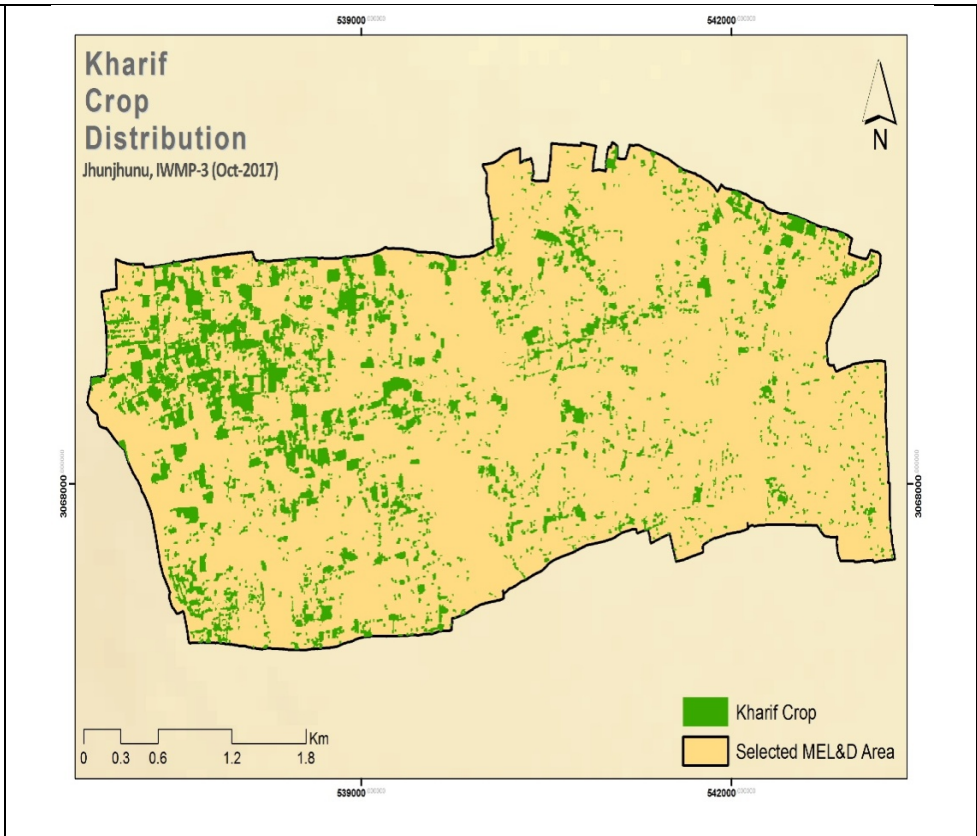
Source: Difference of Area Computed by Satellite Imagery LISSIV (Pre-Post Project, Rabi and Kharif Season)

Satellite imaginary for the study area through GIS based methodology are asunder:

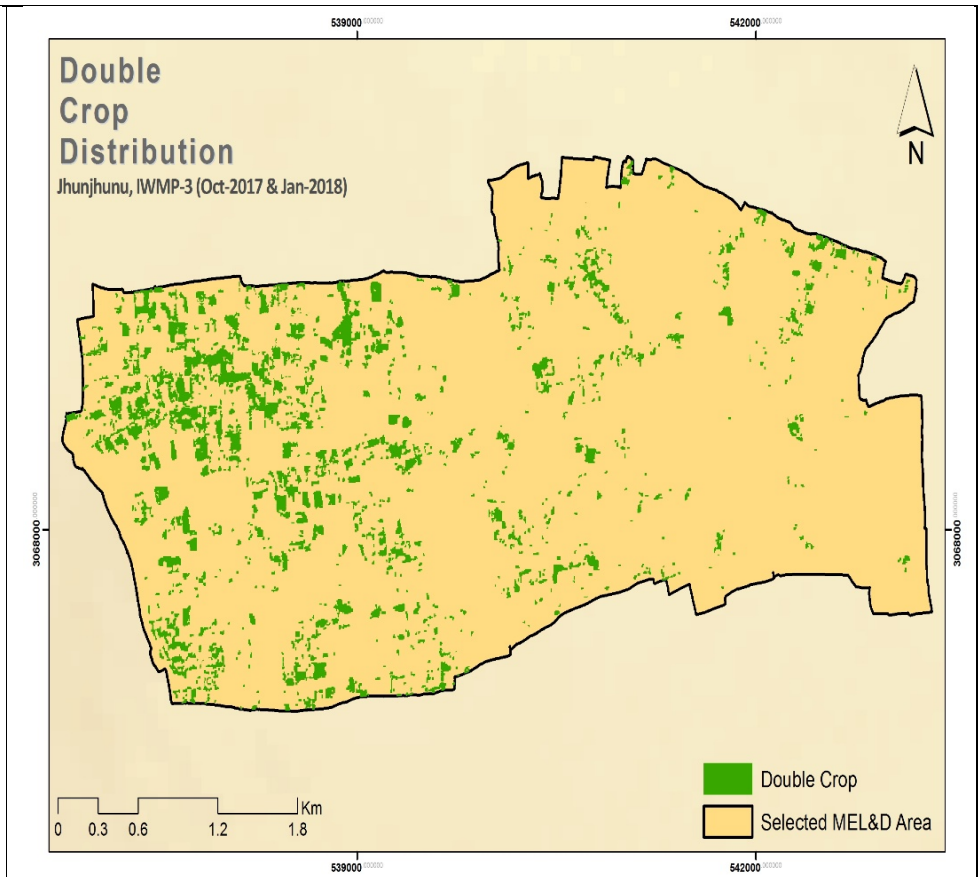
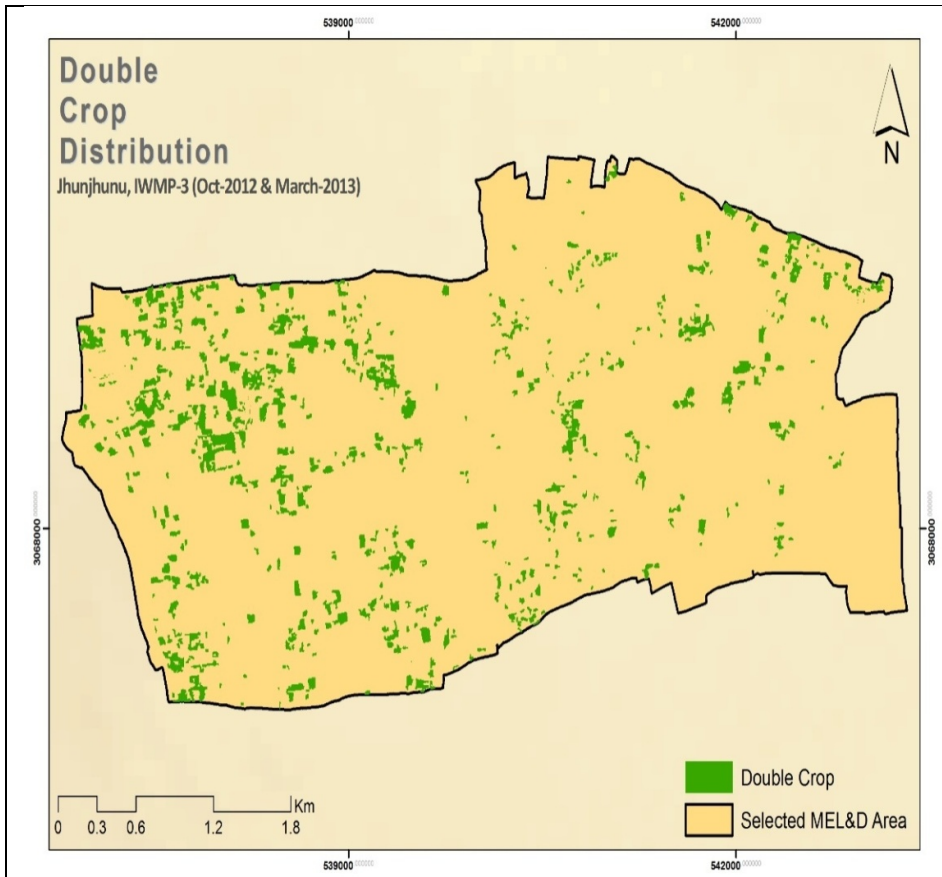




Kharif Crop Distribution in study area (Pre Project Status) computed LISS IV Imagery (Oct.2012)



Kharif Crop Distribution in study area (Post Project Status) computed LISS IV Imagery (Oct 2017)



**Double Crop Distribution in study area
(Pre Project Status) computed LISS IV Imagery (Oct. 2012 & March 2013)**

**Double Crop Distribution in study area (Post Project Status) computed
LISS IV Imagery (Oct. 2017 & Jan. 2018)**

(A) Land use Land Cover distribution and its changes

Table: 8.10

Landuse Class	Area in Pre-Project (Ha)	Area in Post-Project (Ha)	Difference (Post Project-Pre Project)
Agricultural	1074.658	1196.930	122.27
Built Up	63.725	65.601	1.88
Wastelands	276.982	152.833	-124.15

Source: Land use Land Cover distribution Computed as per Satellite Imagery LISSIV

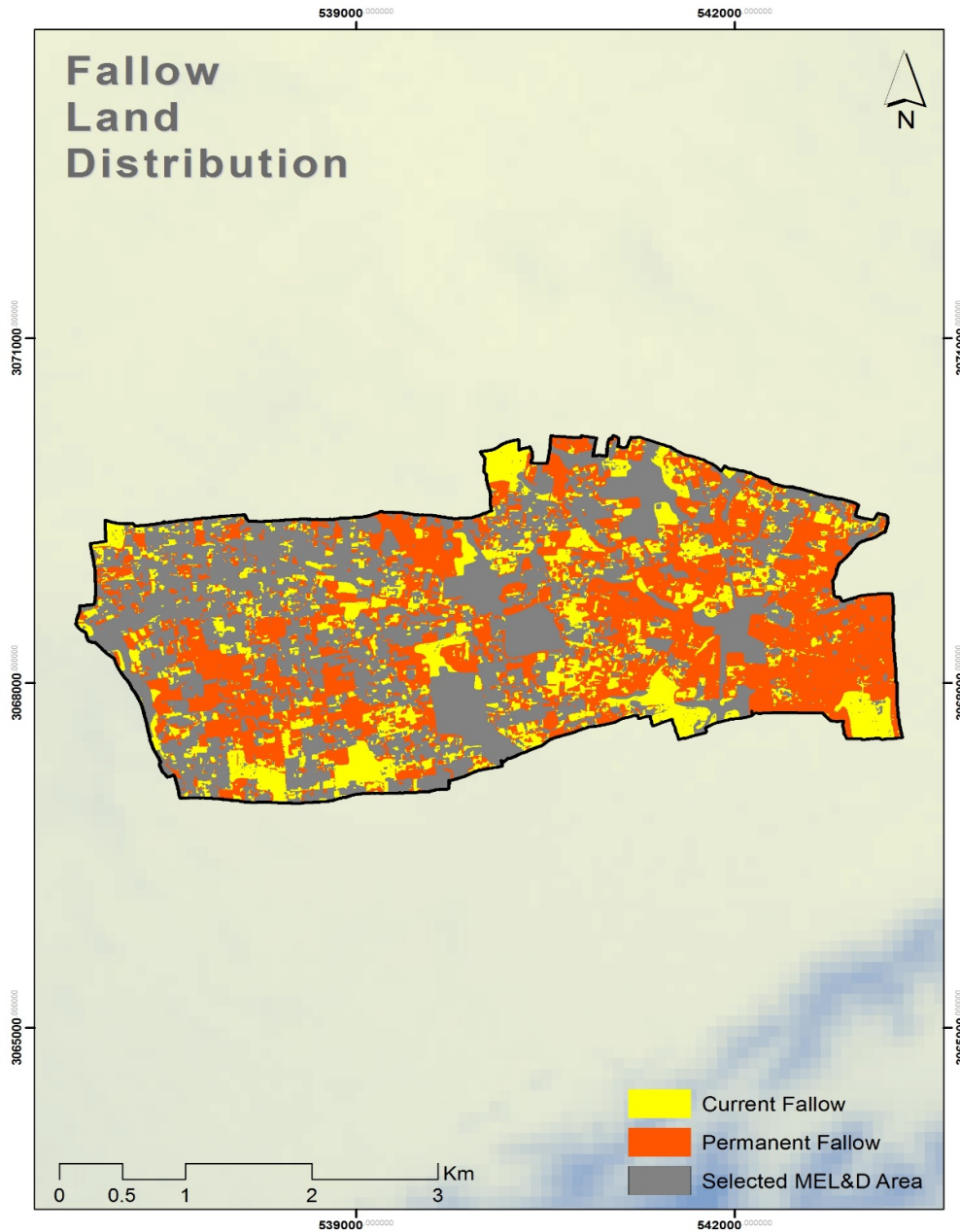


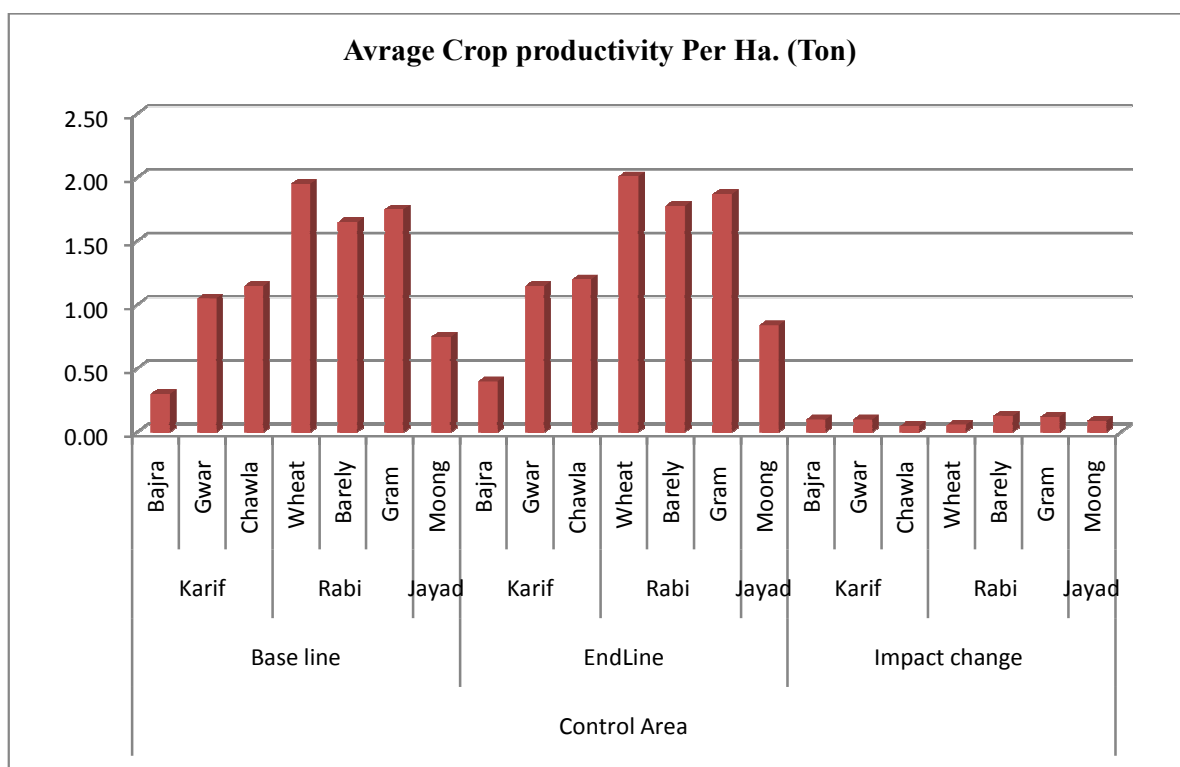
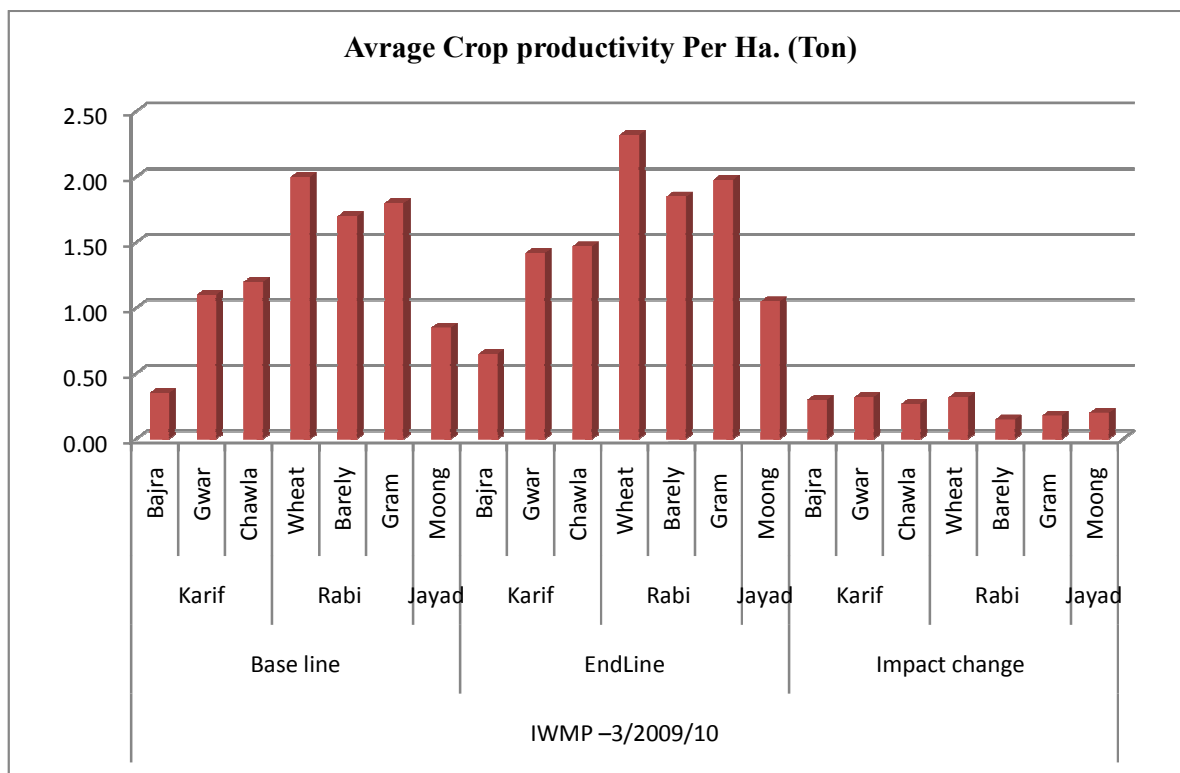
Fig. 8.4 Fallow Land Distribution

8.2.2 Productivity of Crop (Kharif, Rabi and Zaid)

Average Crop Yield/Productivity in IWMP Watershed & Control Area (Kg./ha. & %):

Table: 8.11

IWMP/ Control Area	Timeline	Season	Crop Type	Average Crop productivity Ton Per Ha.
IWMP – 3/2009-10	Base Line	Kharif	Bajra	0.35
			Gwar	1.10
			Chawla	1.20
		Rabi	Wheat	2.00
			Barely	1.70
			Gram	1.80
	Jayad	Moong	0.85	
	EndLine	Kharif	Bajra	0.65
			Gwar	1.42
			Chawla	1.47
		Rabi	Wheat	2.32
			Barely	1.85
			Gram	1.98
	Jayad	Moong	1.05	
	Impact (A)% change	Kharif	Bajra	0.30
			Gwar	0.32
			Chawla	0.27
		Rabi	Wheat	0.32
Barely			0.15	
Gram			0.18	
Jayad	Moong	0.20		
Control Area	Base Line	Kharif	Bajra	0.30
			Gwar	1.05
			Chawla	1.15
		Rabi	Wheat	1.95
			Barely	1.65
			Gram	1.75
	Jayad	Moong	0.75	
	EndLine	Kharif	Bajra	0.40
			Gwar	1.15
			Chawla	1.20
		Rabi	Wheat	2.01
			Barely	1.78
			Gram	1.87
	Jayad	Moong	0.84	
	Impact (A)% change	Kharif	Bajra	0.10
			Gwar	0.10
			Chawla	0.05
		Rabi	Wheat	0.06
Barely			0.13	
Gram			0.12	
Jayad	Moong	0.09		



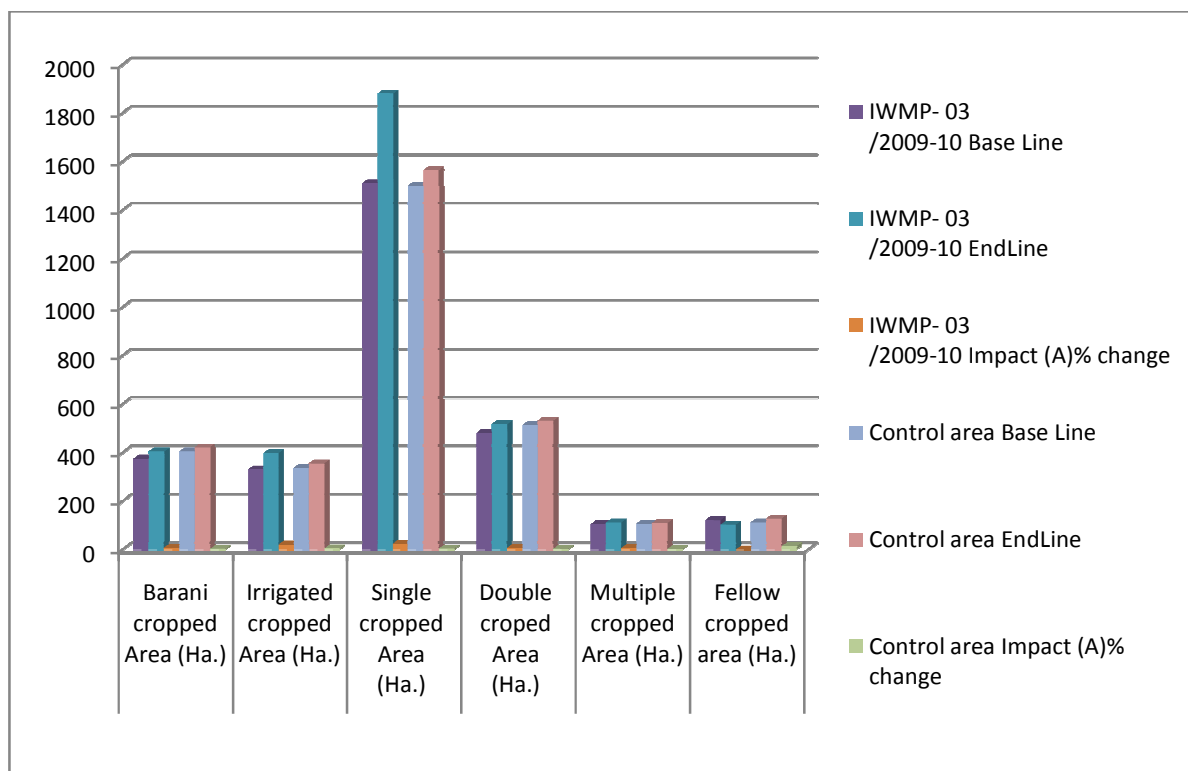
8.2.3 Cropping Pattern Change (Kharif, Rabi and Zaid)

Cropping pattern and diversification in IWMP Watersheds and Control Area

Table: 8.12

IWMP/ Control Area	Time line	Cropping pattern and diversification					
		Barani cropped Area (Ha)	Irrigated cropped Area (Ha)	Single cropped Area (Ha)	Double cropped Area (Ha)	Multiple cropped Area (Ha)	Fellow cropped area (Ha.)
1	2	3	4	5	6	7	8
IWMP-3	Base line	375	330	1510	480	105	120
	End line	405	397	1880	517	112	102
	Impact / Change (ha)	8.00	20.30	24.50	7.71	6.67	-15.00
	Impact / Change (%)	405	337	1500	512	107	112
Control area	Base line	421	355	1564	531	110	128
	End line	3.95	5.34	4.27	3.71	2.80	14.29
	Impact / Change (ha)	375	330	1510	480	105	120
	Impact / Change (%)	405	397	1880	517	112	102

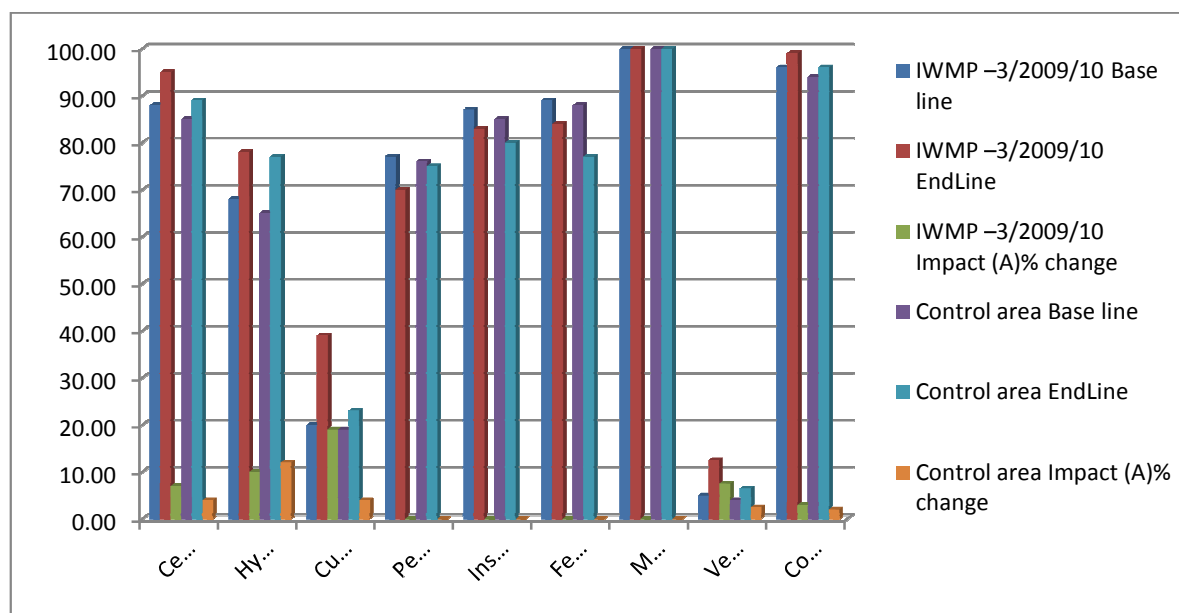
Source: Survey by MEL&D agency



8.2.4 Adoption of new package of practices in IWMP Watershed and Control Area (%):

Table: 8.13

IWMP/ Control Area	Timeline	Certified Seed	Hybrid Seed	Culture	Pesticide	Insecticide	Fertilizer	Manure	Vermi Compost	Compost
1	2	3	4	5	6	7	8	9	10	11
IWMP Project	Pre project	88.00	68.00	20.00	77.00	87.00	89.00	100.00	5	96
	Post project	95.00	78.00	39.00	70.00	83.00	84.00	100.00	12.50	99.00
	Impact / % change	7.00	10.00	19.00	-7.00	-4.00	-5.00	0.00	7.50	3.00
Control area	Pre project	85.00	65.00	19.00	76.00	85.00	88.00	100.00	4	94
	Post project	89.00	77.00	23.00	75.00	60.00	77.00	100.00	6.50	96.00
	Impact / % change	4.00	12.00	4.00	-1.00	-25.00	-11.00	0.00	2.50	2.00



8.2.5 Change in Commercial food, fodder and horticulture crops:

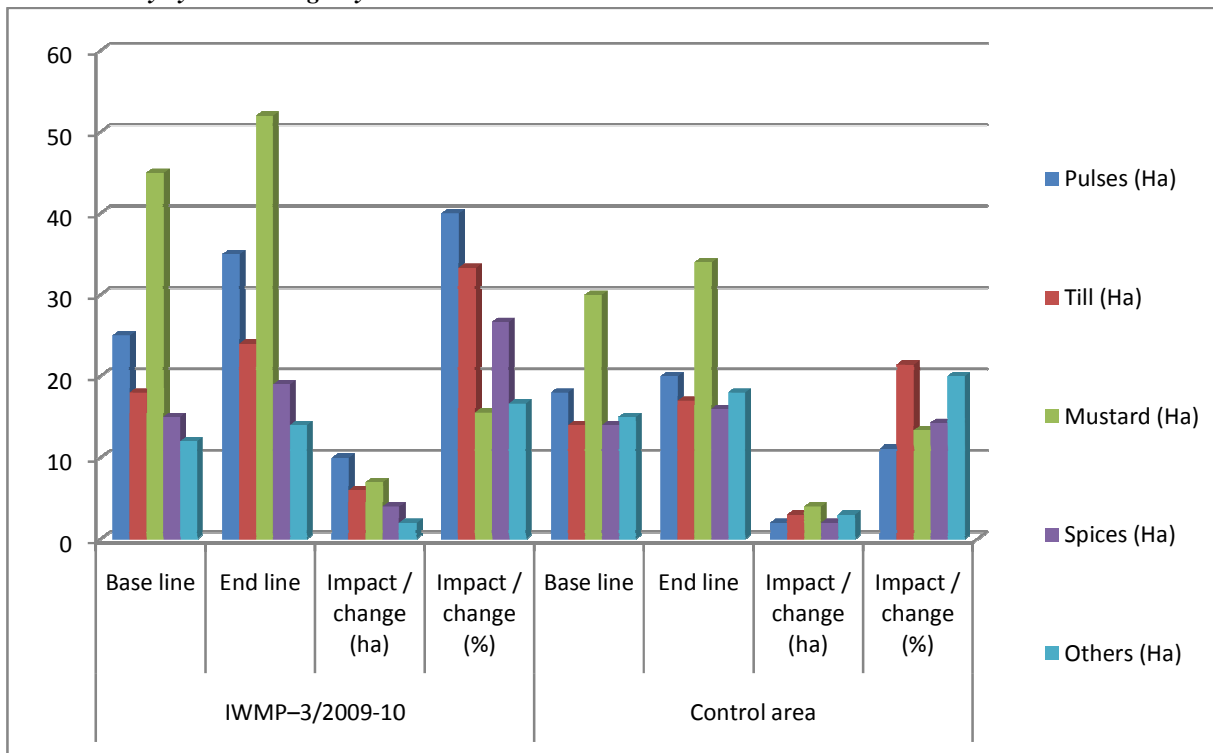
Changes in Commercial Crops in IWMP and Control Area:

Table: 8.14

IWMP/ Control Area	Time line	Pulses (Ha)	Till (Ha)	Mustard (Ha)	Spices (Ha)	Others (Ha)
1	2	3	4	5	6	7
IWMP-3 /2009-10	Base line	25	18	45	15	12
	End line	35	24	52	19	14
	Impact / change (ha)	10	6	7	4	2
	Impact / change (%)	40.00	33.33	15.56	26.67	16.67

IWMP/ Control Area	Time line	Pulses (Ha)	Till (Ha)	Mustard (Ha)	Spices (Ha)	Others (Ha)
1	2	3	4	5	6	7
Control area	Base line	18	14	30	14	15
	End line	20	17	34	16	18
	Impact / change (ha)	2	3	4	2	3
	Impact / change (%)	11.11	21.43	13.33	14.29	20.00

Source: Survey by MEL&D agency

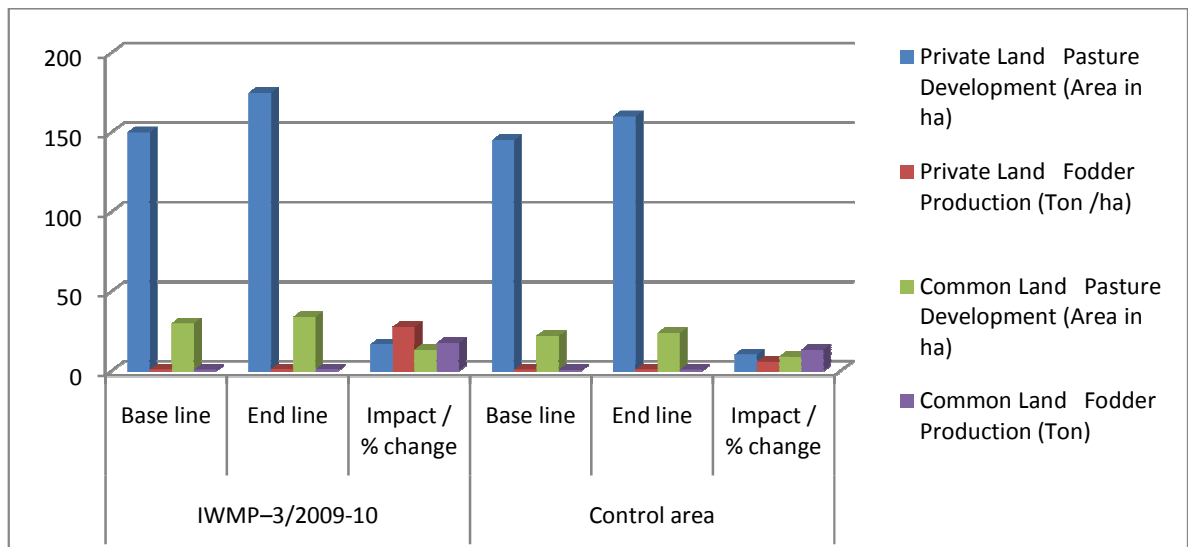


Changes in Fodder Production (Non-brow sable tree species and local grass) in IWMP and Control Area:

Table: 8.15

IWMP/ Control Area	Timeline	Private Land		Common Land	
		Pasture Development (Area in ha)	Fodder Production (Qtls /ha)	Pasture Development (Area in ha)	Fodder Production (Qtls)
1	2	3	4	5	6
IWMP-3 /2009-10	Base line	150	0.9	30	0.85
	End line	175	1.15	34	1
	Impact / change (%)	16.67	27.78	13.33	17.65
Control area	Base line	145	0.85	22	0.75
	End line	160	0.9	24	0.85
	Impact / change (%)	10.34	5.88	9.09	13.33

Source: Survey by MEL&D agency

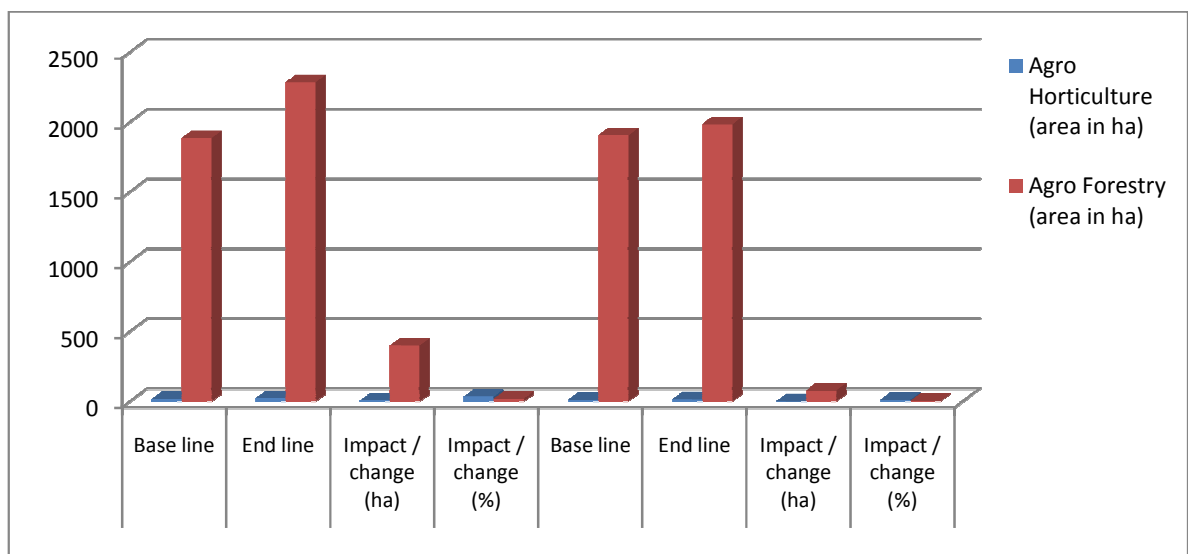


Changes in Agro-horticulture, Agro forestry in IWMP and Control Area:

Table: 8.16

IWMP/ Control Area	Time line	Agro Horticulture (area in ha)	Agro Forestry (area in ha)
1	2	3	4
IWMP-3 /2009-10	Base line	18	1885
	End line	24.5	2285
	Impact / change (ha)	6.5	400
	Impact / change (%)	36.11	21.22
Control area	Base line	13	1905
	End line	14.5	1985
	Impact / change (ha)	1.5	80
	Impact / change (%)	11.54	4.20

Source: Survey by MEL&D agency



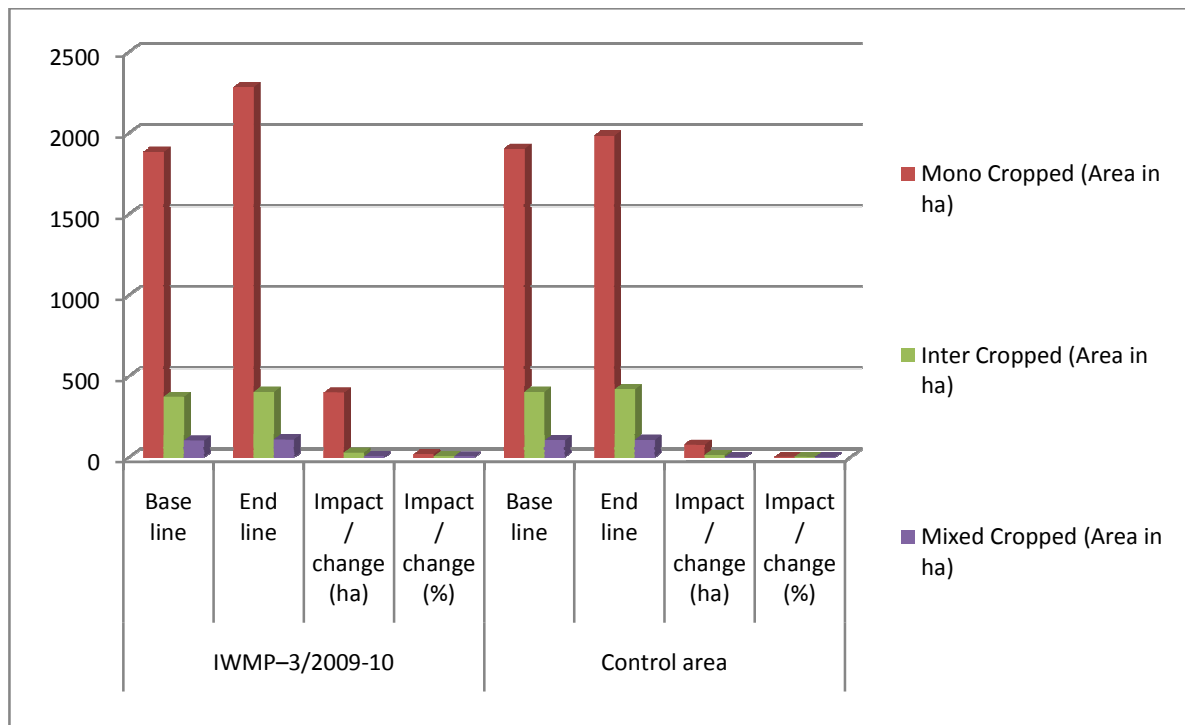
8.2.6 Shift from Mono cropping to Inter Cropping / Mixed Cropping:

Changes in Mono / Inter / Mixed cropping in IWMP Watersheds and Control Area:

Table: 8.17

IWMP/ Control Area	Time line	Mono Cropped (Area in ha)	Inter Cropped (Area in ha)	Mixed Cropped (Area in ha)
1	2	3	4	5
IWMP-3 /2009-10	Base line	1885	375	105
	End line	2285	405	112
	Impact / change (ha)	400	30	7
	Impact / change (%)	21.22	8.00	6.67
Control area	Base line	1905	405	107
	End line	1985	421	110
	Impact / change (ha)	80	16	3
	Impact / change (%)	4.20	3.95	2.80

Source: Survey by MEL&D agency



**8.2.8 Area under Degraded and Waste Lands:
Changes in Waste Lands observed as per remote sensing & GIS based findings:**

Table: 8.18

Land use Class	AreaPre (Ha)	AreaPost(Ha)	Difference (Ha)
Wastelands	276.982	152.833	-124.15

Source: Wasteland Area Distribution Computed as per Satellite Imagery LISSIV (Pre -Post Project, Rabi and Kharif Season)

**(A)Pre Classification of Wastelands
(March 2013 October 2012)**

Table: 8.19

1	2	3
Land use Class	Area (Ha)	Area (%)
Land With Scrub	210.414	75.966
Land Without Scrub	66.569	24.034

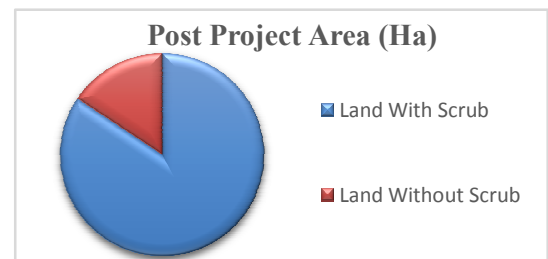
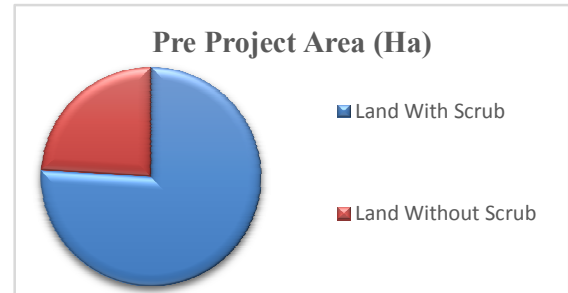
Source: GIS Report by MEL&D agency

**(B)Post Classification of Wastelands
(Sept 2016 Feb 2017)**

Table: 8.20

Landuse Class	Area (Ha)	Area (%)
Land With Scrub	128.923	84.355
Land Without Scrub	23.910	15.645

Source: GIS Report by MEL&D agency

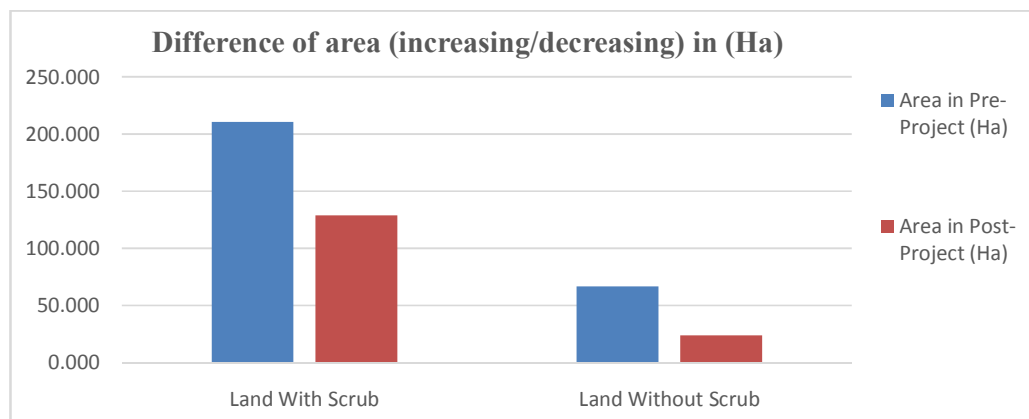


Difference of area (increasing /decreasing) in Hectare

Table: 8.21

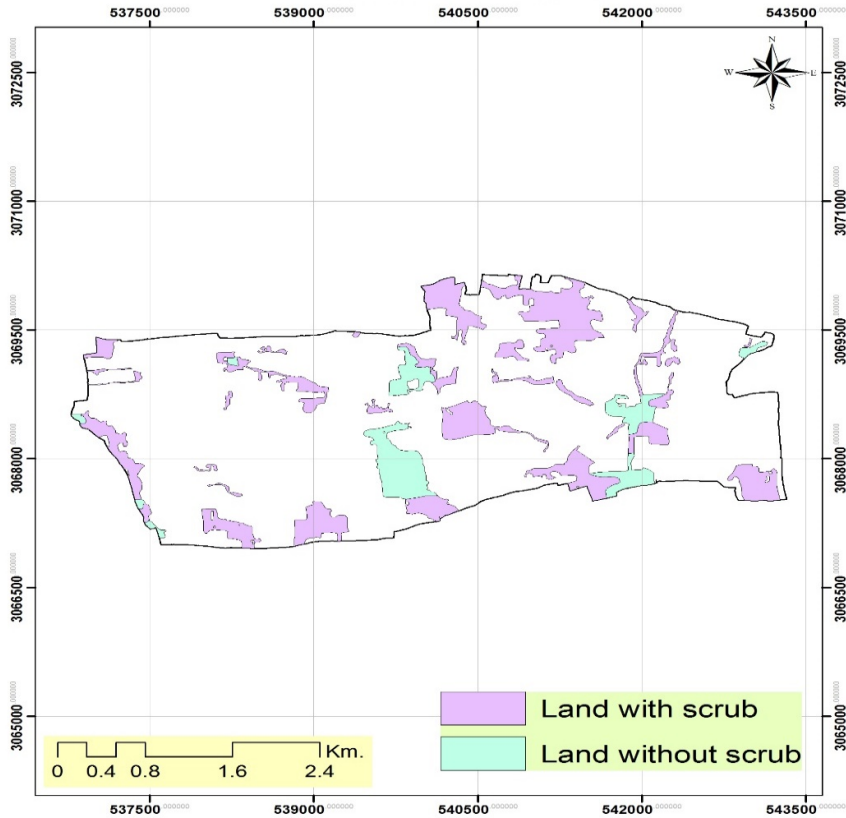
Land use Class	Area Pre (Ha)	Area Post (Ha)	Difference (Ha)
1	2	3	4
Land With Scrub	210.414	128.923	-81.490
Land Without Scrub	66.569	23.910	-42.658

Source: Difference of Wasteland Area Distribution Computed as per Satellite Imagery LISSIV (Pre -Post Project)



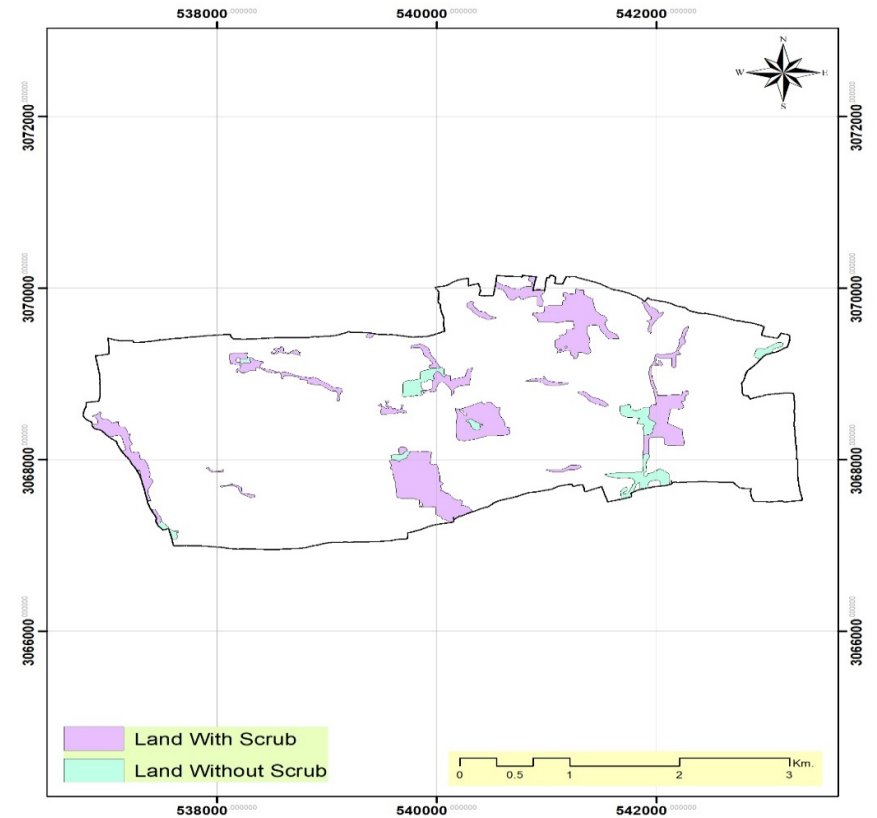
Wasteland Map

IWMP 3 (Jhunjhunu District) Rajasthan



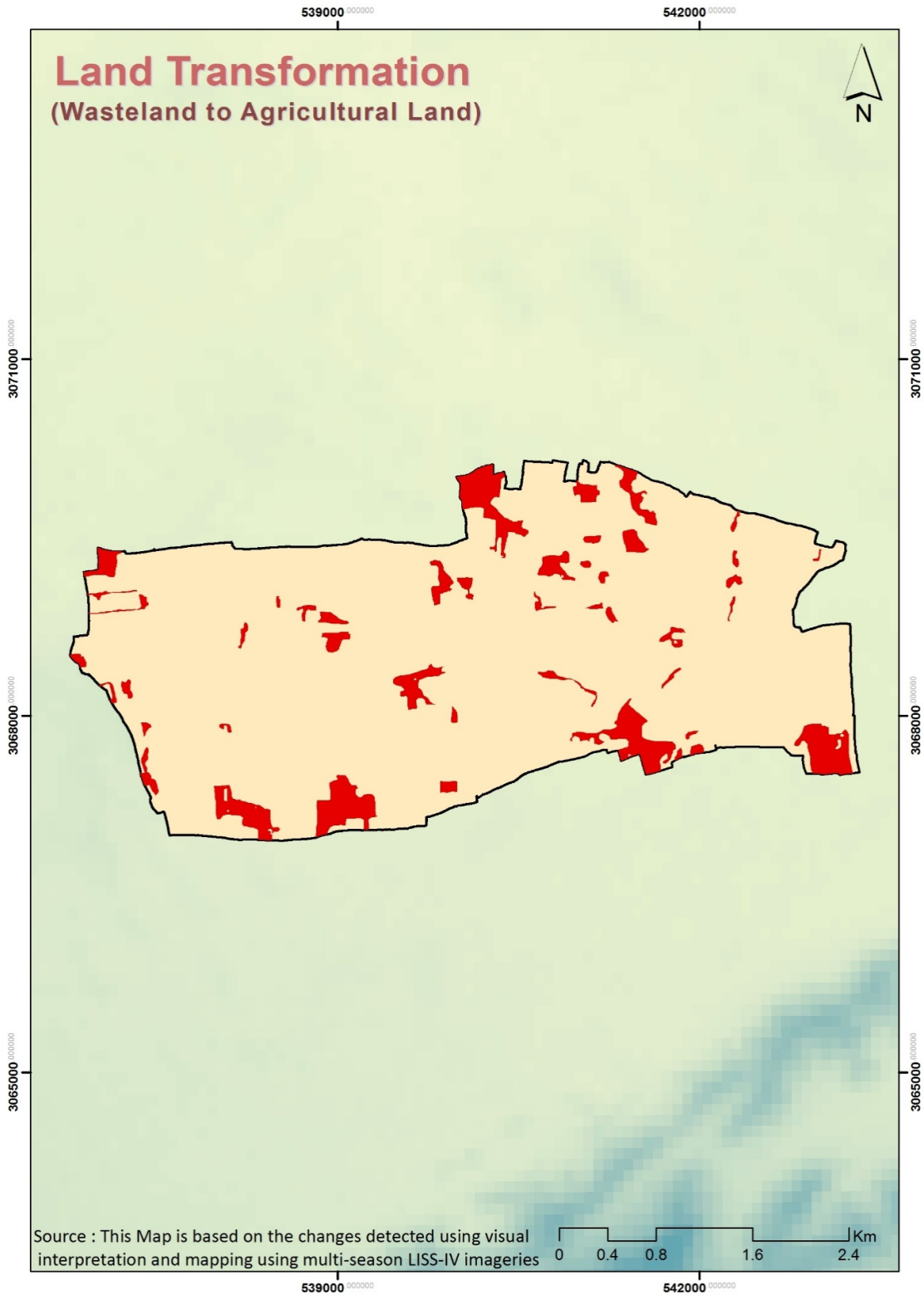
Wasteland Map

IWMP 3 (Jhunjhunu District) Rajasthan



Wasteland Distribution using Visual Interpretation (Pre Project Status)
computed LISS IV Imagery

Wasteland Distribution using Visual Interpretation (Post Project Status)
computed LISS IV Imagery

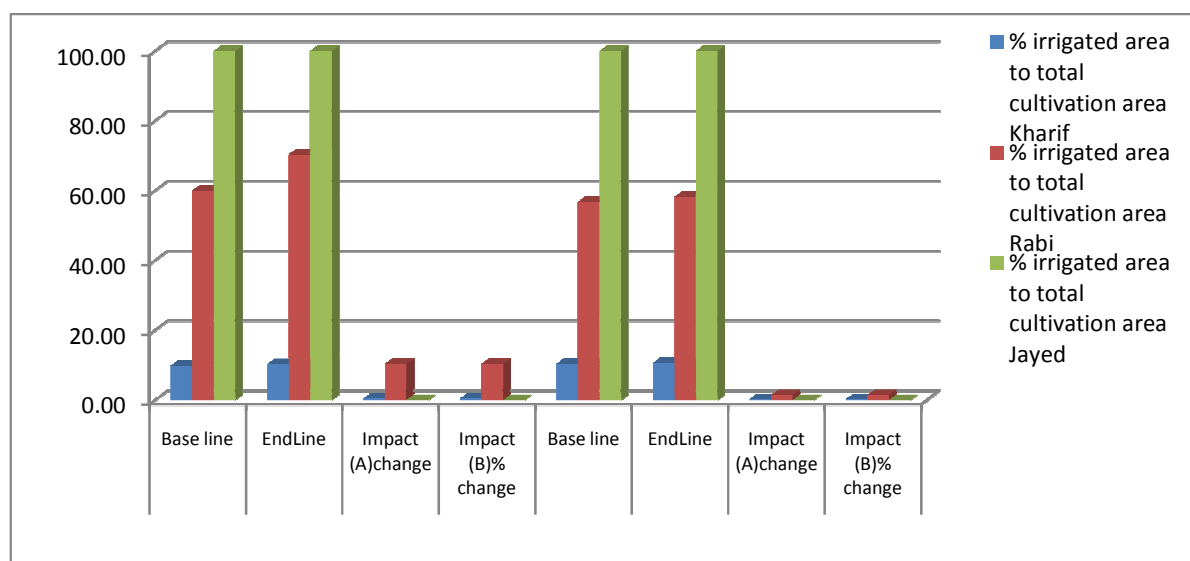


This Map is based on the land transformation (Waste Land to Agriculture) on the basis of change detection by Visual interpretation using multi Season LISS IV data

8.2.9 Area under Irrigation:

Table: 8.22

IWMP/ Control Area	Timeline	Kharif			Rabi			Jayad	% irrigated area to total cultivation area		
		Bajra	Others	Total	Wheat	Others	Total		Total	Kharif	Rabi
IWMP – 3/2009/1 0	Base line	1015	870	1885	275	100	375	105	9.81	60.0	100.0
	EndLine	1250	1035	2285	300	105	405	112	10.28	70.3	100.0
	Impact change	235	165	400	25	5	30	7	0.47	10.3	0.00
	Impact % change	23.15	18.97	21.22	9.09	5.00	8.00	6.67	0.47	10.3	0.00
Control area	Base line	1020	885	1905	285	120	405	107	10.39	56.7	100.0
	EndLine	1080	905	1985	298	123	421	110	10.63	58.1	100.0
	Impact change	60	20	80	13	3	16	3	0.24	1.40	0.00
	Impact % change	5.88	2.26	4.20	4.56	2.50	3.95	2.80	0.24	1.40	0.00



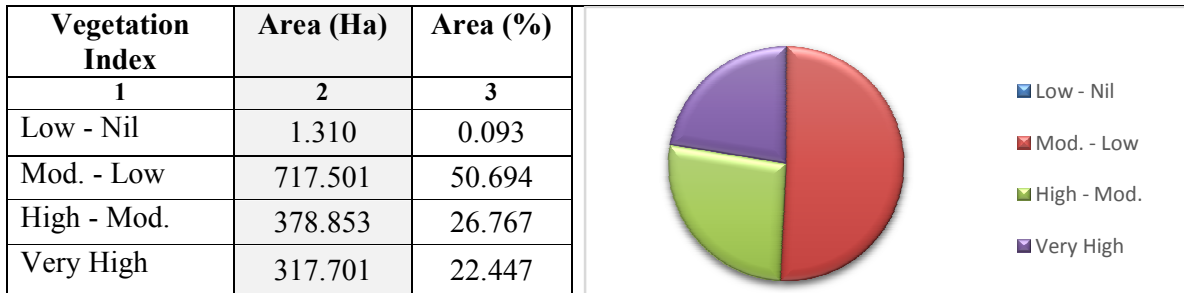
8.2.10 Vegetation Density:

LISS-IV imagery belonging to Rabi season of pre and post project times are used for computing NDVI and further classified using natural breaks in histogram. NDVI model is computed using two bands i.e. Near Infra-red and Red. The NIR band records good reflection of vegetated areas and is built mainly for vegetation studies. Fig. 8.5 shows a conceptual model of how NDVI is computed. Arc GIS gives the facility to plot NDVI values against pixel population and further to identify the natural breaks (Jerks) in the histogram. Therefore, the NDVI output was further classified into four categories viz. High – Very High, High – Moderate, Moderate – low, Low – very low. The very high - high vegetation class occupies very less area as the study area belongs to arid region. Therefore, very small patches exhibiting bunch of trees, young crop etc falls under this category. High to moderate class mainly represents mainly dense scrubland, mature crops whereas the moderate to low belongs to scattered and degraded scrublands. The low to

very low class represents fallow lands, rocky and mining areas, land without scrub and salt affected areas.

(A): Pre Classification of Vegetation Index

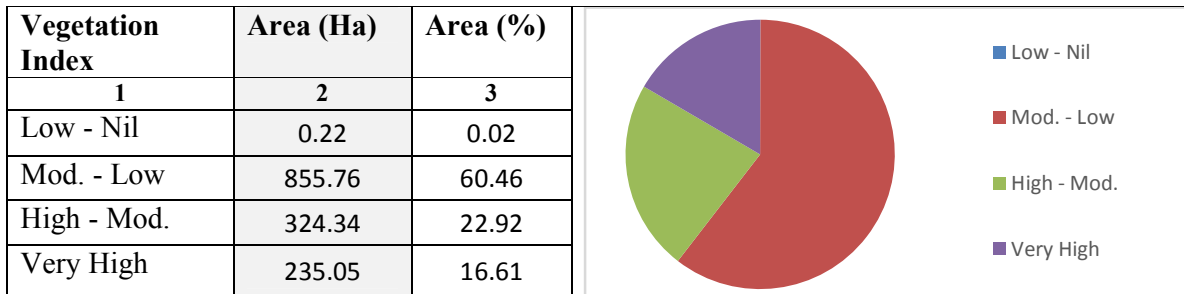
Table: 8.23



Source: Vegetation Density of Rabi season Computed as per satellite Imagery LISSIV(Pre-project Status)

(B): Post Classification of Vegetation Index

Table: 8.24



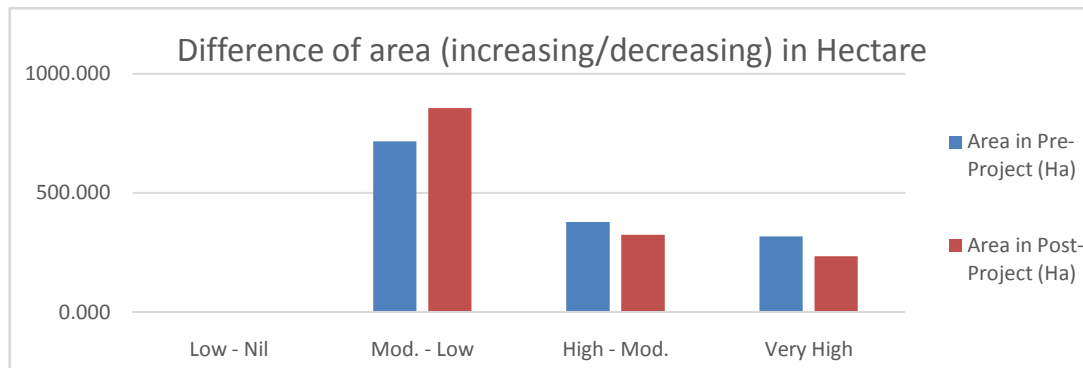
Source: Vegetation Density of Rabi season Computed as per satellite Imagery LISSIV(Post-project Status)

Difference of area (increasing /decreasing) in Hectare

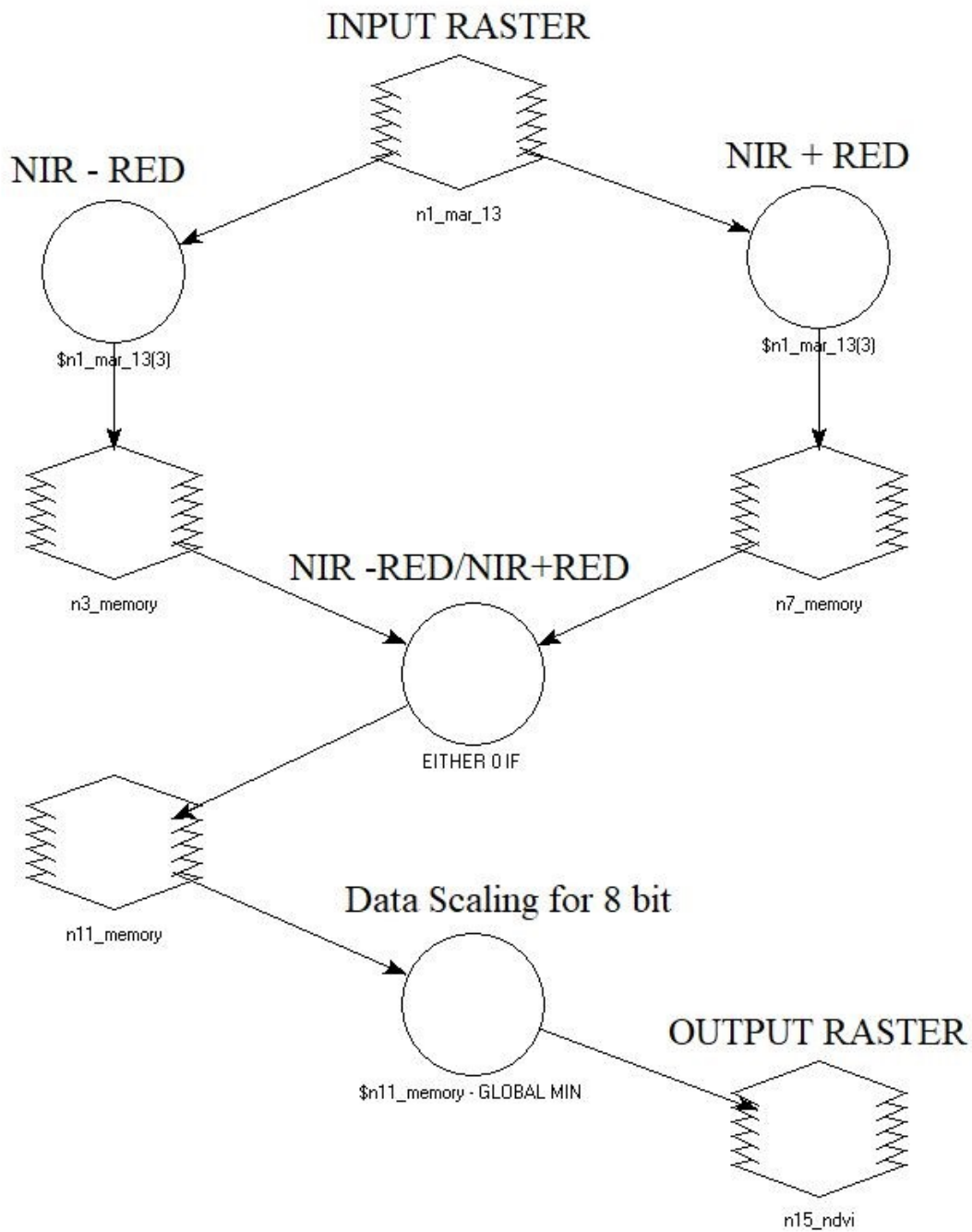
Table: 8.25

Vegetation Index	Area Pre (Ha)	Area Post Ha)	Difference
1	2	3	4
Low - Nil	1.310	0.22	-1.09
Mod. - Low	717.501	855.76	138.25
High - Mod.	378.853	324.34	-54.51
Very High	317.701	235.05	-82.65

Source: Difference of Area Vegetation Density Rabi season Computed as per satellite Imagery LISSIV(Pre-Post Project Status)

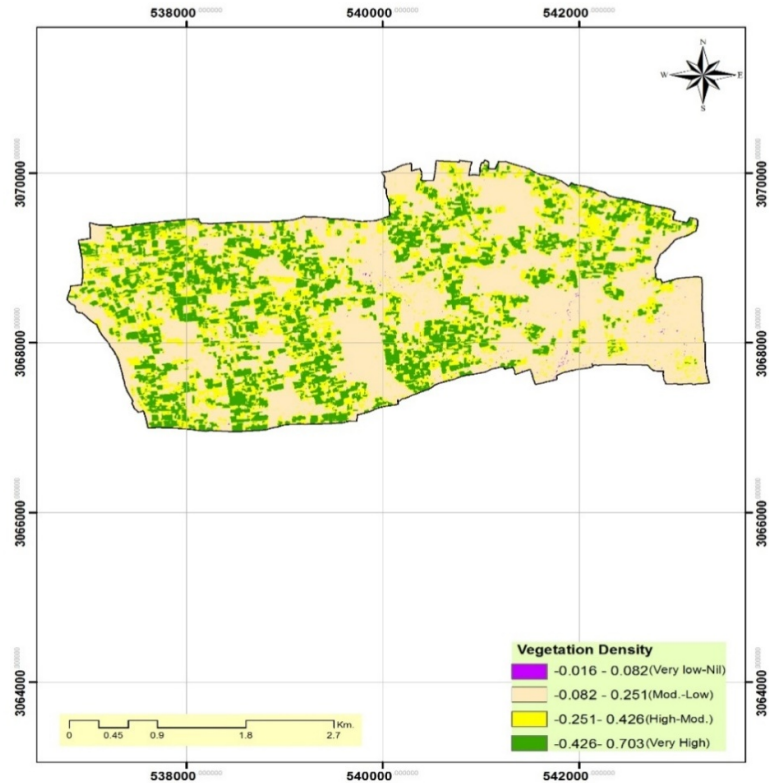


Normalized Difference Vegetation Index



Vegetation Index

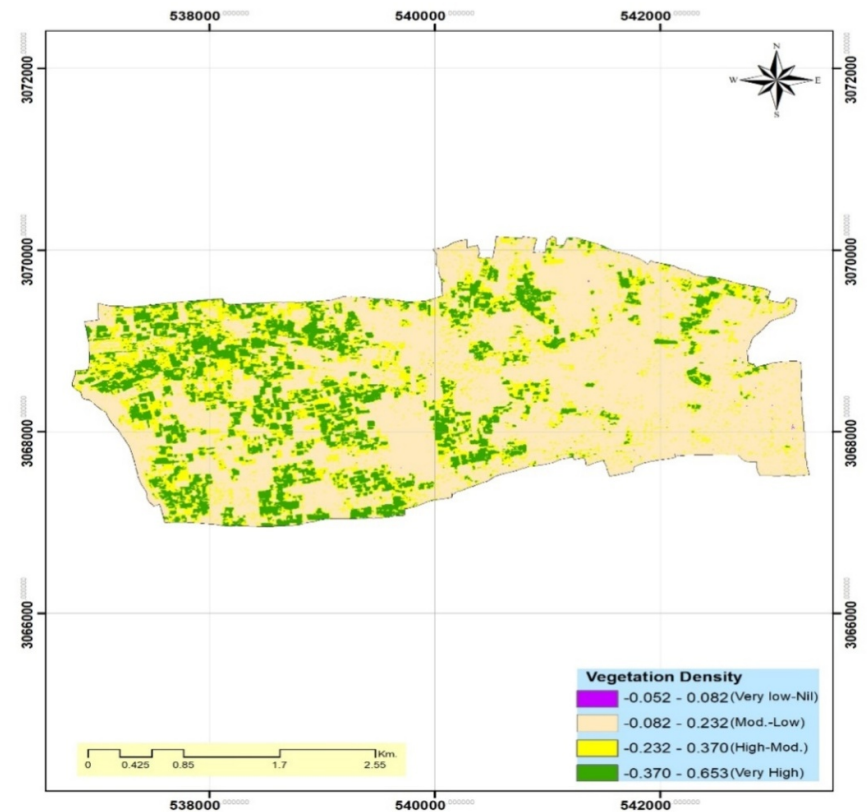
Jhunjhunu IWMP-3 (Mar, 2013)



Vegetation Density using NDVI in study area Rabi Season (Pre Project Status – March 2013) computed LISS IV Imagery

Vegetation Index

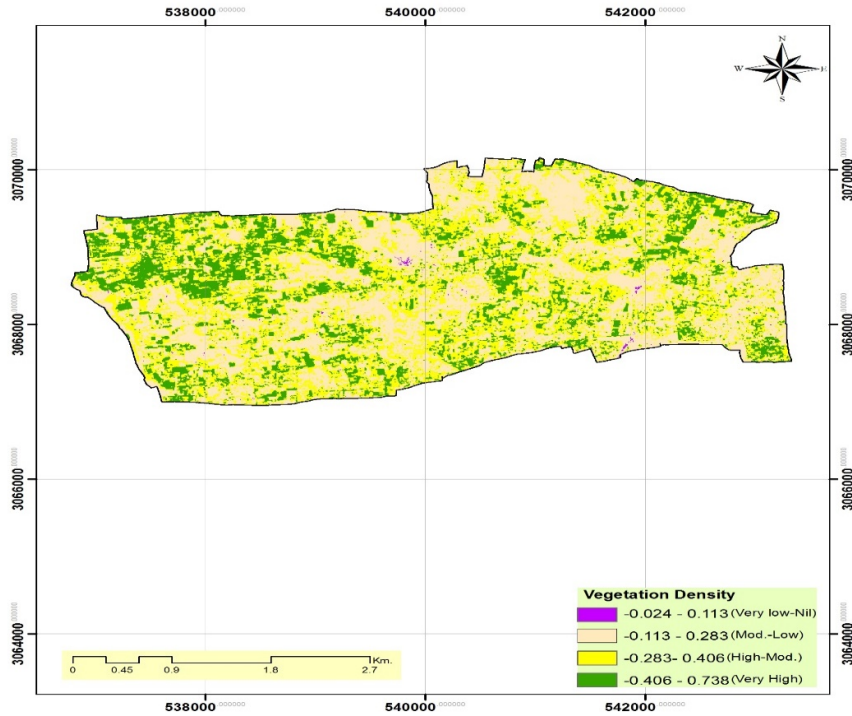
Jhunjhunu IWMP-3 (Jan., 2018)



Vegetation Density using NDVI in study area Rabi Season (Post Project Status Jan. 2018) computed LISS IV Imagery

Vegetation Index

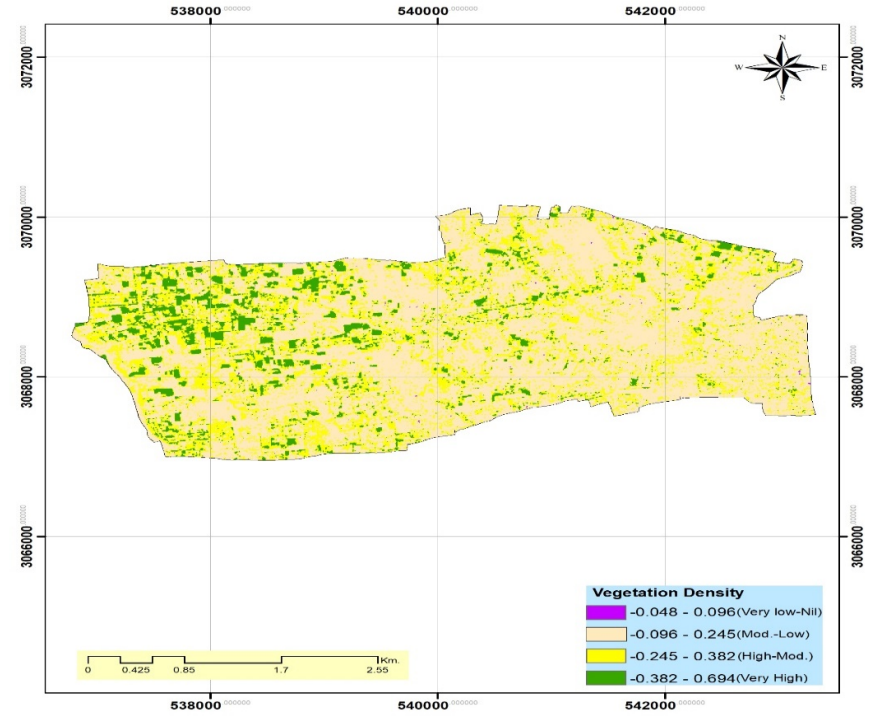
Jhunjhunu IWMP-3 (Oct, 2012)



Vegetation Density using NDVI in study area Kharif Season (Pre Project Status Oct. 2012) computed LISS IV Imagery

Vegetation Index

Jhunjhunu IWMP-3 (Oct., 2017)



Vegetation Density using NDVI in study area Kharif Season (Post Project Status Oct.2017) computed LISS IV Imagery

8.2.11 Shift from Annual Crops to Perennial Crops:

Nowadays, most of the agricultural land is used for intensive food production. Depending on agricultural practices the intensification often comes at the cost of land degradation. Nowadays, most of the agricultural land is used for intensive food production. Depending on agricultural practices the intensification often comes at the cost of land degradation.

The major crops used globally to feed people and livestock – wheat, rice, maize and soy – are based on an annual system, in which crop plants live one year, are harvested, and are replanted the following year. These systems are notorious, however, for stripping organic nutrients from soils over time.

Perennial systems, on the other hand, contain plants that live longer than one-year despite being harvested annually. Perennial Crops allocate more resources belowground, thus sustaining important ecosystem services. Hence, shifting from annual to perennial crops has been advocated towards a more sustainable agriculture. Many agricultural scientists, say that perennial crops are the key to creating more sustainable agricultural systems.

Agricultural areas are often fragmented and have a mosaic-like structure. They frequently comprise major and minor land cover types. The latter are often difficult to classify. Indeed, it is commonly recognized that unevenly distributed classes could deteriorate the performance of most standard classification methods. To derive more detailed LULC maps, time series data from the LISS IV images also be used because they allow to track seasonal variation of vegetation development. Several studies have shown that time series could better discriminate between different types of vegetation than single snapshot.

Here LISS-IV imagery belonging to entire pre and post project times series data are used for computing perennial crop area, annual crop area and plantation on the basis of visual interpretation shown in Fig no.8.7 & 8.8 and table no. 8.33.

Land use diversification

Table : 8.26

S. No	Changes		Area (In Ha)
	From (Pre)	To (Post)	
1	2	3	4
1	Annual Crops (84.27)	Perennial Crops	38.84
2	Waste lands (276.98)	Crop Lands	26.224
3	Agriculture	Built Up/Water bodies	1.81

Source: GIS Report by MEL&D agency

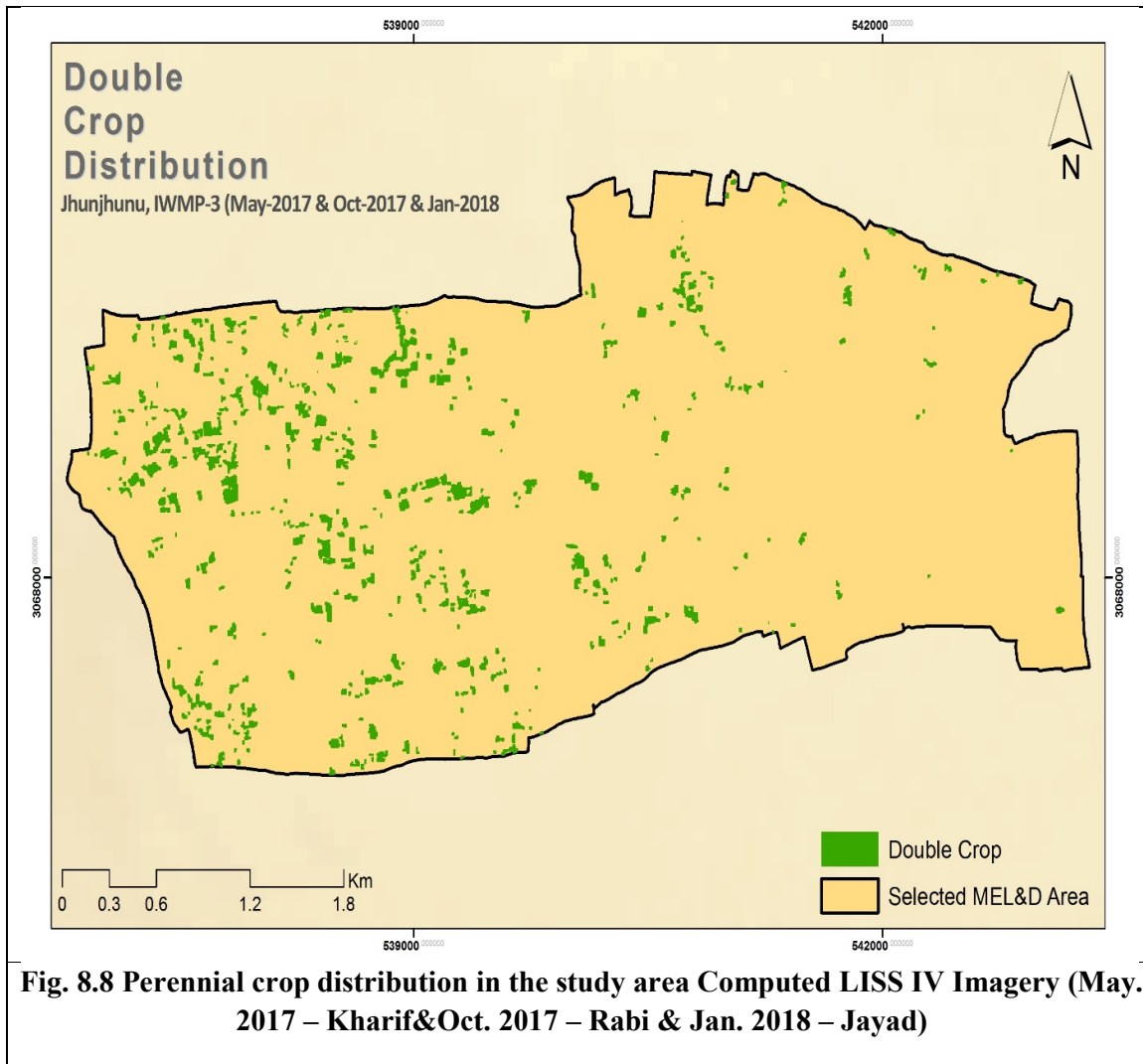


Fig. 8.8 Perennial crop distribution in the study area Computed LISS IV Imagery (May. 2017 – Kharif&Oct. 2017 – Rabi & Jan. 2018 – Jayad)

8.2.14 Moisture Density:

LISS-IV imagery belonging to Rabi season of pre and post project times are used for computing NDWI and further classified using natural breaks in histogram. The Normalized Difference Moisture Water Index (NDWI) is a satellite-derived index from the Near-Infrared (NIR) and Green channels. The NDWI output was further classified into four categories viz. High – Very High, High – Moderate, Moderate – low, Low – very low. The output image reflects changes in both the vegetation water content and soil moisture. This specialized band rationing algorithm improves the accuracy in analysing the water content and moisture distribution over a given area.

$$NDWI = (Green - IR) / (Green + IR)$$

Soil Moisture Content and Availability through Wetness Index

(A): Pre Classification of Soil Moisture

Table: 8.27

Soil Moisture	Area (Ha)	Area (%)
1	2	3
Low - Nil	286.78	20.26
Mod. - Low	387.08	27.35
High - Mod.	740.92	52.35
Very High	0.59	0.04

Source: Moisture Density Kharif season Computed as per satellite Imagery LISSIV(Pre project Status)

(B): Post Classification of Soil Moisture

Table: 8.28

Soil Moisture	Area (Ha)	Area (%)
1	2	3
Low - Nil	212.27	15.00
Mod. - Low	375.70	26.54
High - Mod.	826.16	58.37
Very High	1.23	0.09

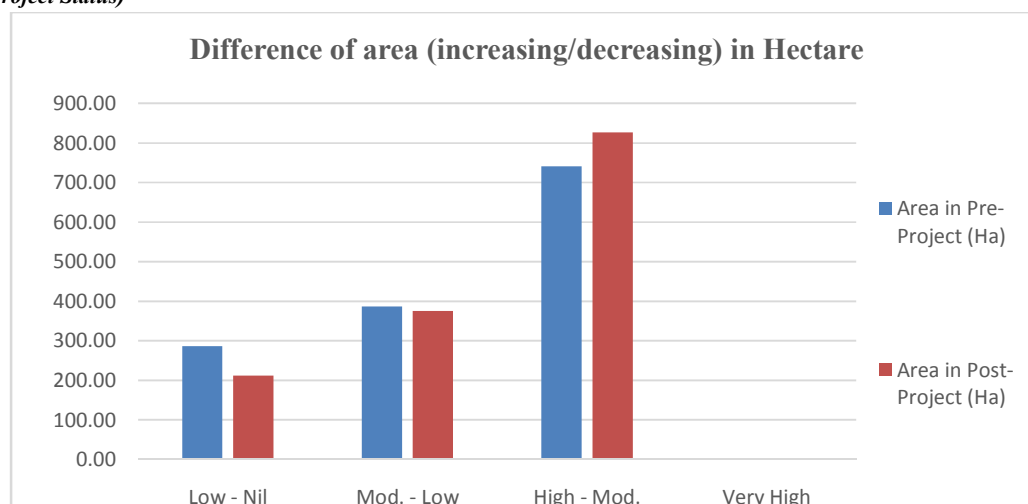
Source: Moisture Density Kharif season Computed as per satellite Imagery LISSIV(Post project Status)

Difference of area (increasing /decreasing) in Hectare

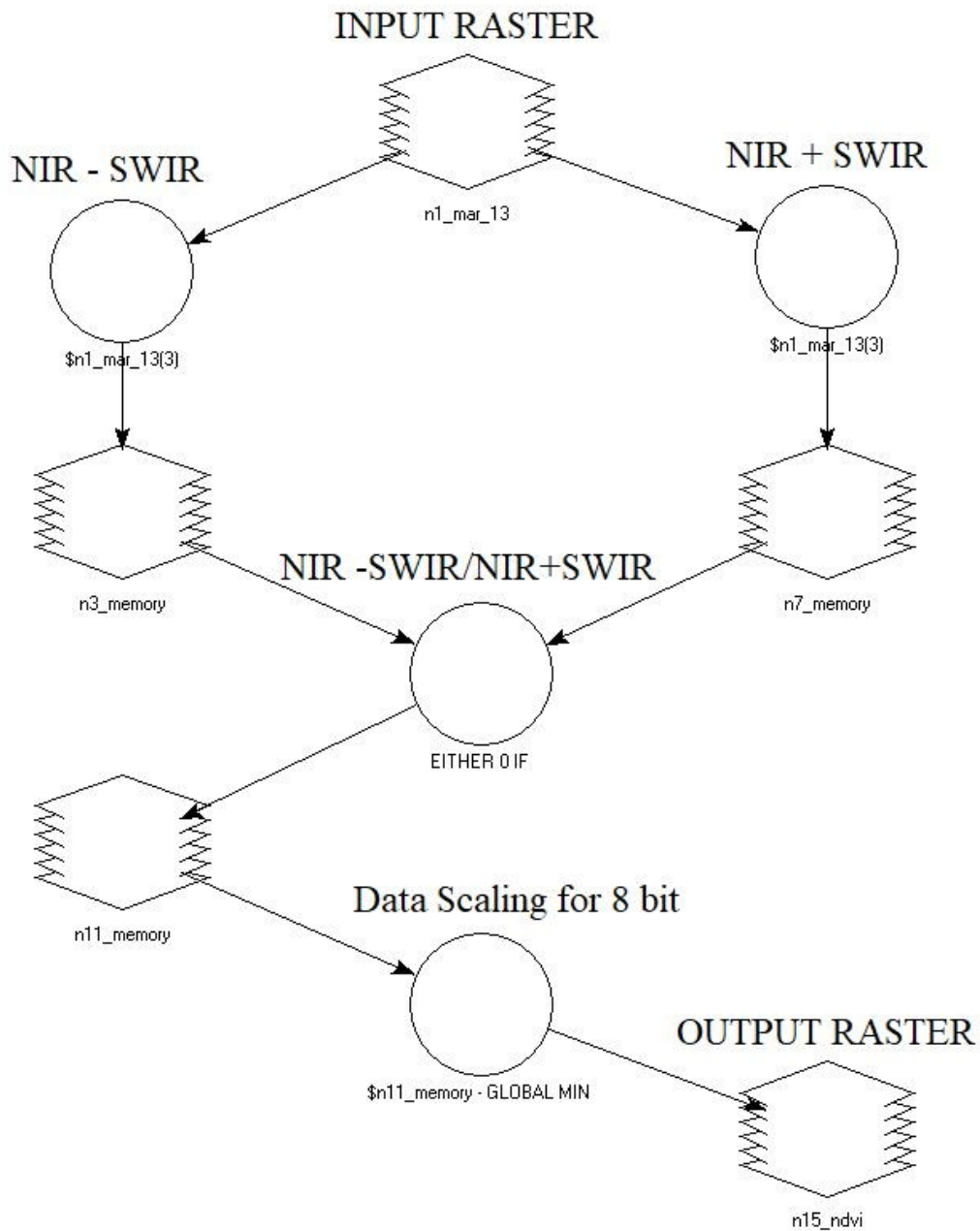
Table: 8.29

Soil Moisture	Area Pre (%)	Area Post (%)	Difference
1	2	3	4
Low - Nil	286.78	212.27	-74.507
Mod. - Low	387.08	375.70	-11.374
High - Mod.	740.92	826.16	85.237
Very High	0.59	1.23	0.644

Source: Difference of Area Moisture Density Kharif season Computed as per satellite Imagery LISSIV(Pre, Post-project Status)

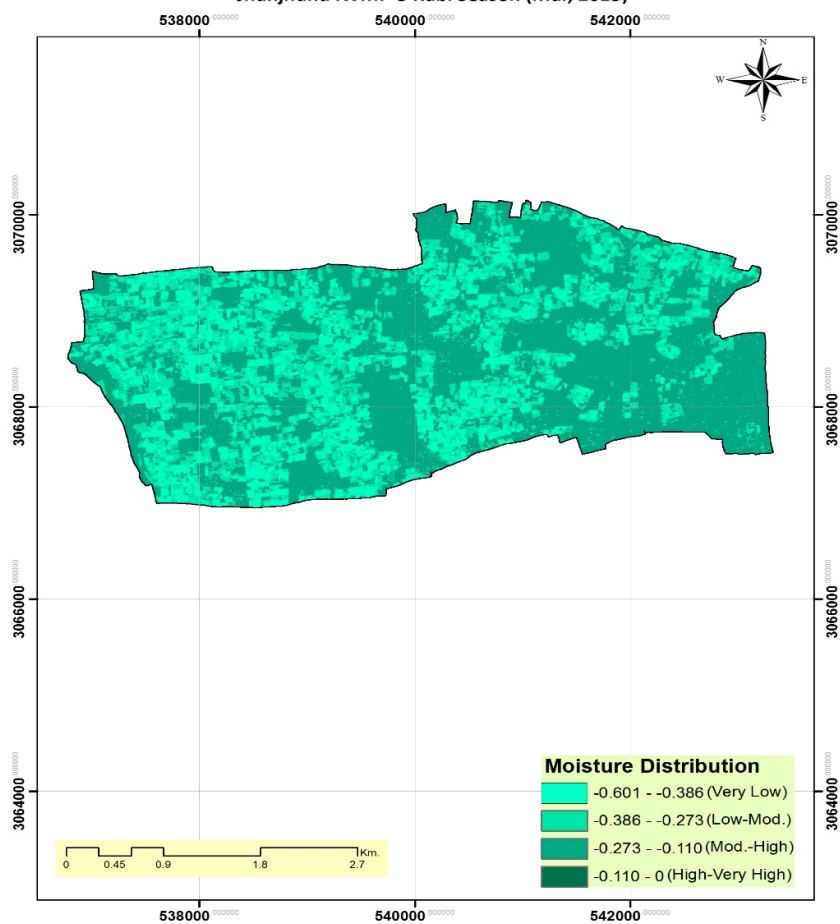


Normalized Difference Water Index



Moisture Content Distribution

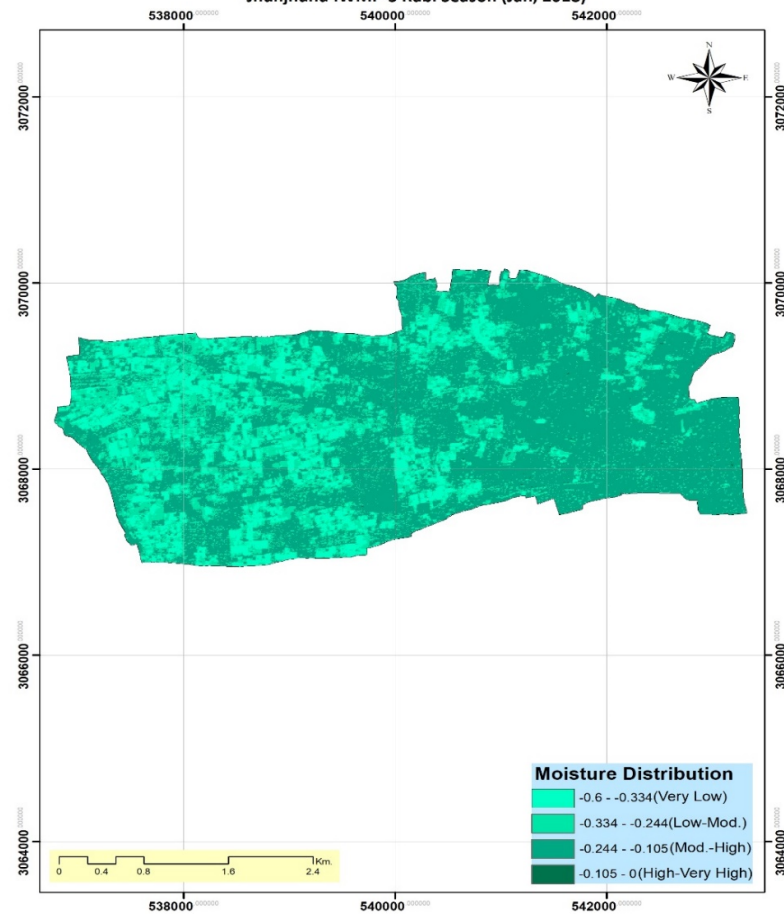
Jhunjhunu IWMP-3 Rabi Season (Mar, 2013)



Moisture Density using NDWI in study area Rabi Season(Pre Project Status- March 2013) computed LISS IV Imagery

Moisture Content Distribution

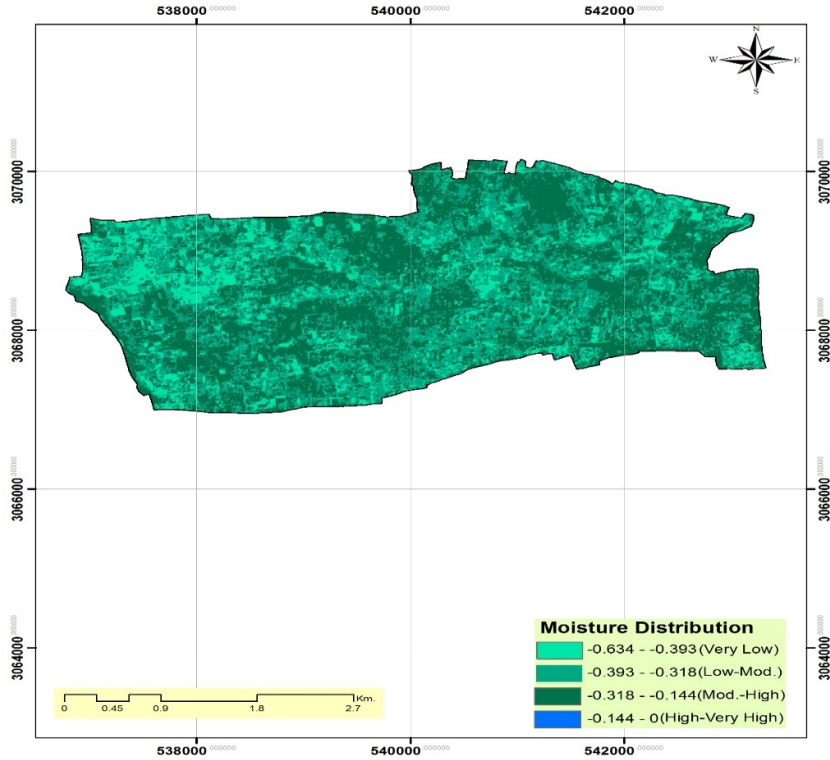
Jhunjhunu IWMP-3 Rabi Season (Jan, 2018)



Moisture Density using NDWI in study area Rabi Season(Post Project Status – Jan.2018) computed LISS IV Imagery

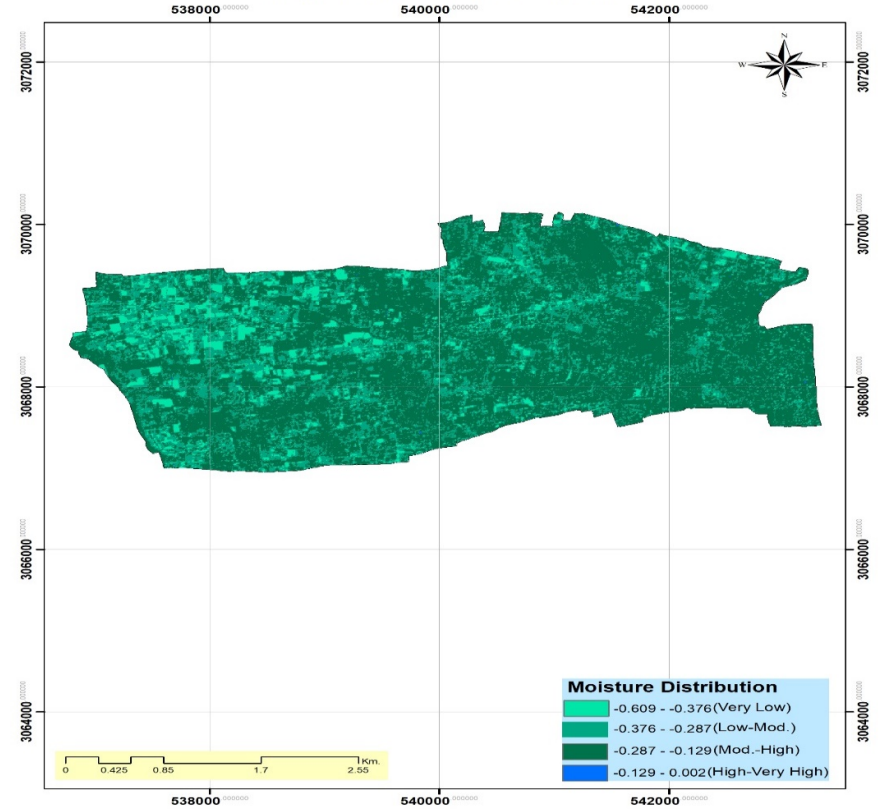
Moisture Content Distribution

Jhunjhunu IWMP-3 Kharif Season (Oct, 2012)



Moisture Content Distribution

Jhunjhunu IWMP-3 Kharif Season (Oct., 2017)



Moisture Density using NDWI in study area Kharif Season (Pre Project Status – Oct. 2012) computed LISS IV Imagery

Moisture Density using NDWI in study area Kharif Season (Post Project Status – Oct. 2017) computed LISS IV Imagery

CHAPTER –9

Watershed Development Fund (WDF)

9.1 WDF at a Glance in IWMP-3/2009-10 project, Jhunjhunu:

Watershed Development Fund in IWMP 3/2009-10:

Table: 9.1

S. No.	Particular	Status
1	2	3
1.	Assets transferred to	Gram Panchayat
2.	Condition/ Quality of assists	Very Good
3.	Amount of WDF (Total) amount available (Rs.) and with whom / what level.	Rs.20.33 Lacs
4.	Monitoring of Revolving fund by and total amount under circulation / available (Rs.)	4.50Lacs

Source: PIA and survey by MEL&D agency

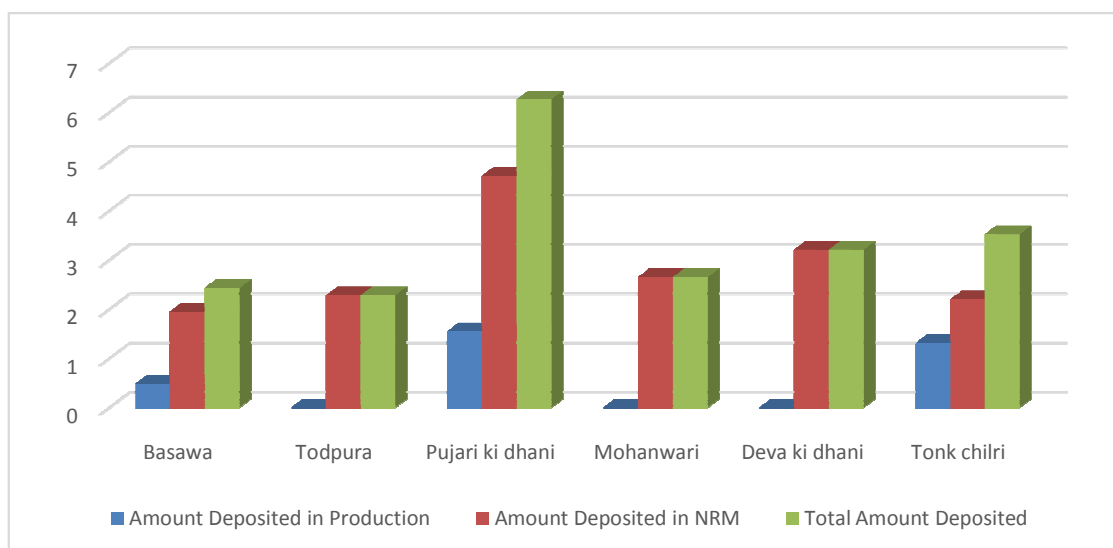
9.2 Details of Amount Deposited in WDF in IWMP-3/2009-10 project:

Details of Amount Deposited in WDF in IWMP-3/2009-10 project

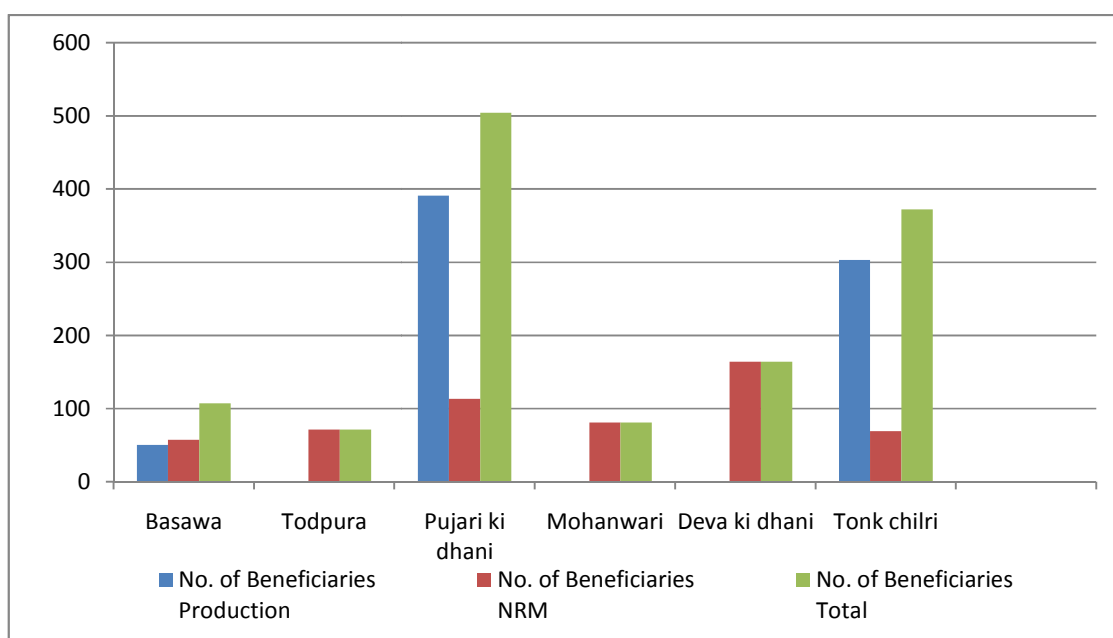
Table:9.2

Sno	Name of Watershed Committee	Name of Bank	Account No.	Amount Deposited (in lacs Rs.)			No. of Beneficiaries		
				Production	NRM	Total	Production	NRM	Total
1	2	3	4	5	6	7	8	9	10
1	Basawa	sbi basawa	61309903725	0.48	1.95	2.43	50	57	107
2	Todpura	sbi basawa	61210082742	0	2.28	2.28	0	71	71
3	Pujari ki dhani	Brkgb	43130100007250	1.55	4.71	6.26	391	113	504
4	Mohanwari	Sbi Basawa	61211868871	0	2.65	2.65	0	81	81
5	Deva ki dhani	OBC Nawalgarh	4481010003636	0	3.21	3.21	0	164	164
6	Tonk chilri	Sbi Basawa	61211907298	1.31	2.20	3.52	303	69	372
Total				3.34	16.99	20.33	744	555	1299

Source: PIA and survey by MEL&D agency



Details of Watershed Committee-wise Amount Deposited in WDF in Jhunjhunu, IWMP-3/2009-10



Details of Watershed Committee-wise no. of beneficiaries in Jhunjhunu, IWMP-3/2009-10

It is observed that a sum of **Rs. 3.34** is collected as Farmer's contribution out of Production activities and **Rs. 16.99 Lacs** out of NRM activities, thus total **Rs. 20.33 Lacs** is available in the WDF. Further, it is also reported that **744 Nos.** of beneficiaries have contributed in Production System and **555 Nos.** in NRM works, thus total beneficiaries contributed in WDF is **1299 Nos.**

CHAPTER –10

Outcomes of IWMP

During Final Stage Impact Evaluation, primary and secondary data is collected from the different sources both for watershed area and for the control area. These data is compared for witnessing the change with the base line values. For data collection, structured formats were prepared and standard procedures of MELD assignment were followed. In the subsequent paras of this chapter, the Outcomes observed in IWMP-3/2009-10, watershed project are enumerated in detail:

10.1 Human Resource Development - Capacity Building and Institutional

Development:

Development & Formation of village level institutions in IWMP Watershed and Control

Area (Nos./%):

In watershed project area, at the final impact evaluation stage, the status of formation of village level institution is monitored. It is observed that formation of no. of SHGs (25 to 130 No.) is increased by **420.00%** with an increase of **420.00%** number of members (250 to 1300 No.) and no. of UGs (5 to 29 No.) is increased by **480.00%** with an increase of **484.00%** number of members (50 to 292 No.).

In control area, at the final impact evaluation stage, the status of formation of village level institution is monitored. It is observed that formation of no. of SHGs (22 to 34 No.) is increased by **60.00%** with an increase of **54.54%** number of members (220 to 340 No.) and no. of UGs (4 to 9 No.) is increased by **125.00%** with an increase of **125.00%** no. of members (40 to 90 No.).

Formation of village level institutions in IWMP Watershed and Control Area (Nos./%):

Table: 10.1

IWMP/ Control Area	Timeline	SHGs (Nos.)		UGs (Nos.)	
		Total No. of SHGs	Total Members	Total No. of UGs	TOTAL Members
1	2	3	4	5	6
IWMP-3 /2009-10	Base line	25	250	5	50
	End line	130	1300	29	292
	Impact /change (No.)	105	1050	24	242
	Impact/change (%)	420.0	420.0	480.0	484.0
Control area	Base line	22	220	4	40
	Endline	34	340	9	90
	Impact /change (No.)	12	120	5	50
	Impact/change (%)	60.00	54.54	125.00	125.00

Source: PIA and survey by MEL&D agency

10.2 Social Aspects:

10.2.1 Family Profile in IWMP watershed and Control Area (%):

In watershed project area, at the final impact evaluation stage, Above Poverty Line (APL) population is increased by **0.10%** and Below Poverty Line (BPL) population is decreased by **0.10%**. As regards to farmer types-wise description, **less than 0.00%** change is noticed from Large category to Marginal and medium category that might be due to fragmentation of land holdings over the years.

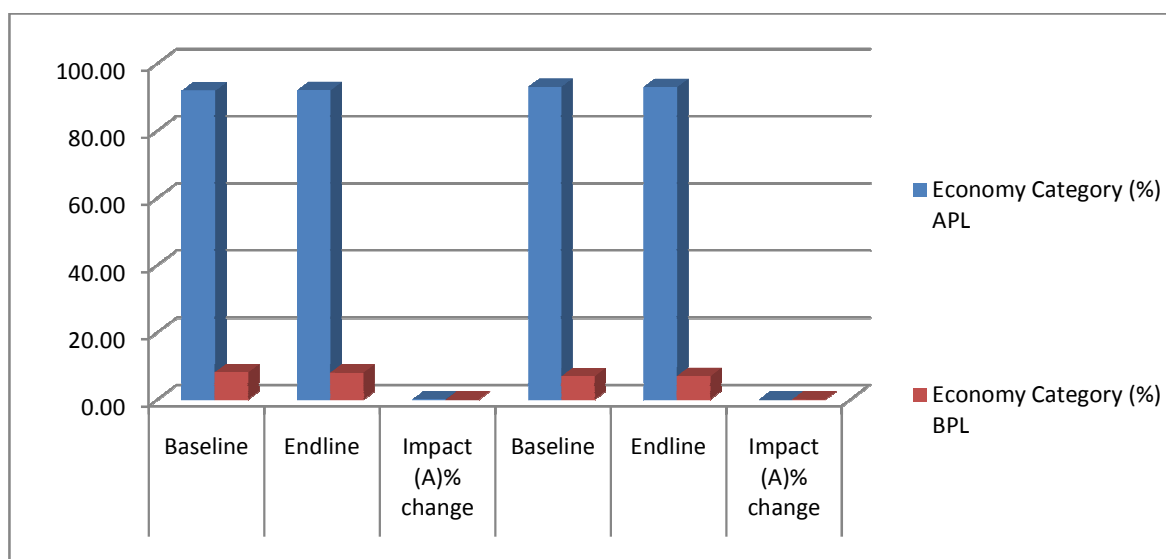
In Control area, at the final impact evaluation stage, Above Poverty Line (APL) population is decreased by **0.89%** and Below Poverty Line (BPL) population is increased by **0.11%**. As regards to farmer types-wise description, again **less than 1.02%** change is noticed from Large category to Marginal and medium category that might be due to fragmentation of land holdings over the years.

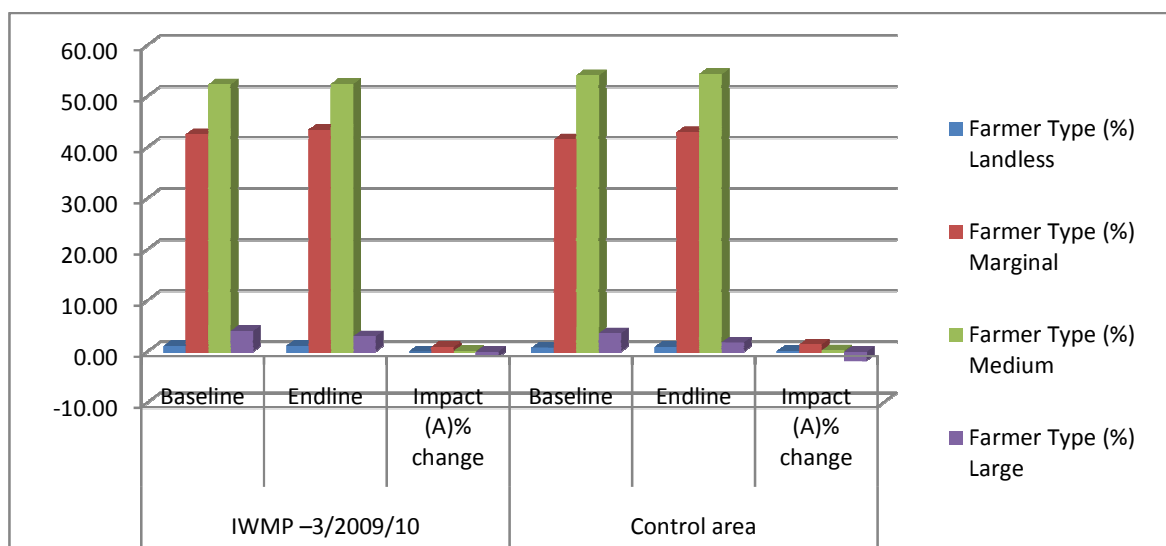
Family Profile:-Category of Households - Caste, Economy class and Type in IWMP watershed and Control Area (%):

Table: 10.2

Name of Area	Time line	Economy Category (%)		Farmer Type (%)			
		APL	BPL	Landless	Marginal	Medium	Large
1	2	3	4	5	6	7	8
IWMP-3 /2009-10	Baseline	91.91	8.09	1.11	42.55	52.31	4.03
	End line	92.01	7.99	1.13	43.44	52.42	3.01
	Impact change	0.10	-0.10	0.02	0.89	0.11	-1.02
Control area	Baseline	93.06	6.94	0.79	41.53	54.09	3.59
	Endline	93.01	6.99	0.89	42.98	54.33	1.80
	Impact change	-0.05	0.05	0.10	1.45	0.24	-1.79

Source: Census data & survey by MEL&D agency





10.2.2 Livestock details in IWMP Watershed and Control Area (unit/%):

In watershed project area, at the final impact evaluation stage, the livestock detail including milk productivity and self-sufficiency was monitored. It was observed that **improved breeds**; an increase of **29.73%** (from 4278 to 5550 Nos) in Cows, an increase of 78.46% (from 4623 to 8250 Nos.) in Buffaloes, an increase of 22.49% (from 5922 to 7254 Nos.) in Goats. The **average milk production** in Kg. per day was observed as an increase of 26.32% (from 9.5 to 12 Kg./Day) in Cows, an increase of 29.41% (from 8.5 to 11 Kg./Day) in Buffaloes, an increase of 20% (from 2.5 to 3.00 Kg/Day) in Goats.

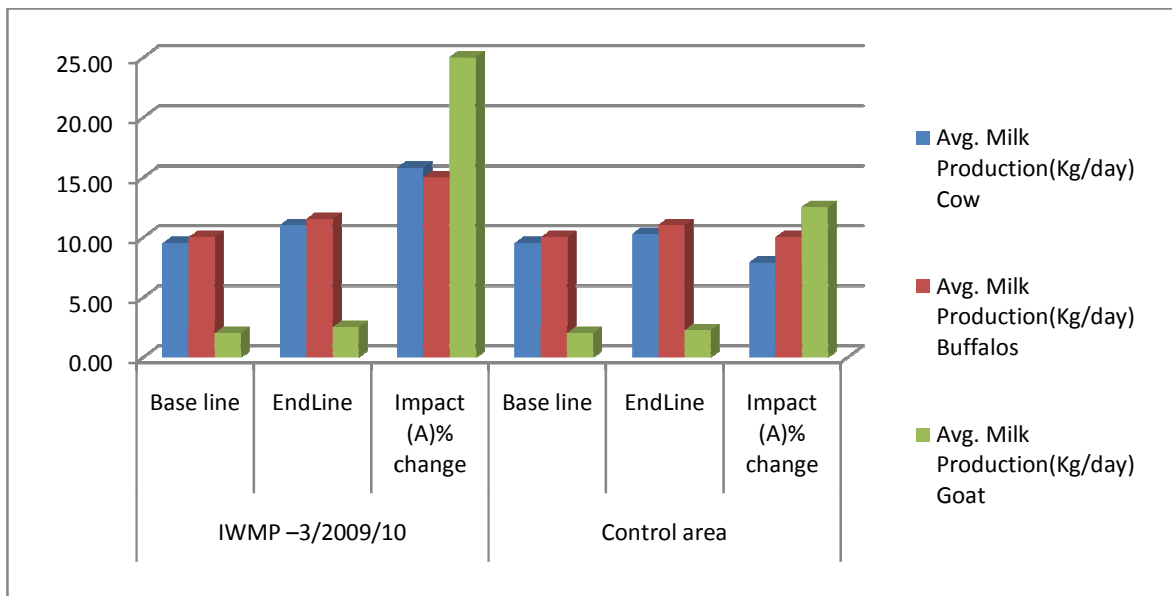
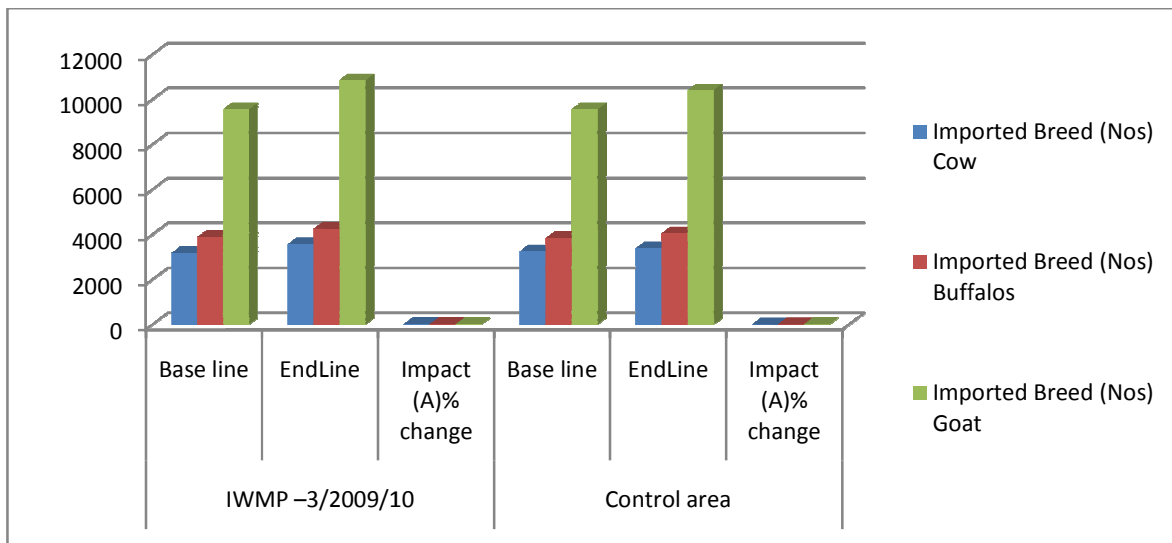
In control area, at the final impact evaluation stage, the livestock detail including milk productivity and self-sufficiency was monitored. It was observed that **improved breeds**; an increase of 8.6% (from 4314 to 4685Nos) in Cows, an increase of **22.07%** (from 4526 to 5525 Nos.) in Buffaloes, an increase of **8.5 %** (from 6009 to 6520 Nos.) in Goats. The **average milk production** in Kg. per day was observed as an increase of **15.79%** (from 9.5 to 11 Kg./Day) in Cows, an increase of **25.56%** (from 9 to 11.30 Kg./Day) in Buffaloes, an increase of 10% (from 2.5 to 2.75 Kg/Day) in Goats.

Livestock details in IWMP Watershed and Control Area (unit/%):

Table: 10.3

IWMP/ Control Area	Time line	Imported Breed (Nos)			Avg. Milk Production(Kg/day)		
		Cow	Buffaloes	Goat	Cow	Buffaloes	Goat
1	2	3	4	5	6	7	8
IWMP-3 /2009-10	Base line	3176	3885	9558	9.50	10.00	2.00
	End line	3562	4250	10850	11.00	11.50	2.50
	Impact / Change (%)	12.15	9.40	13.52	15.79	15.00	25.00
Control area	Base line	3247	3839	9559	9.50	10.00	2.00
	End line	3385	4050	10400	10.25	11.00	2.25
	Impact / Change (%)	4.25	5.50	8.80	7.89	10.00	12.50

Source: survey by MEL&D agency



10.2.3 Drinking Water Facilities in IWMP Watershed & Control Area (%):

In watershed project area, at the final impact evaluation stage, the changes in drinking water facilities were monitored. It was observed that there is an increase of **12.59%** in Government Supply, increase of **2.44%** in private supply, decrease of **1.94%** in hand pumps, decrease of **1.73%** in tanker supply.

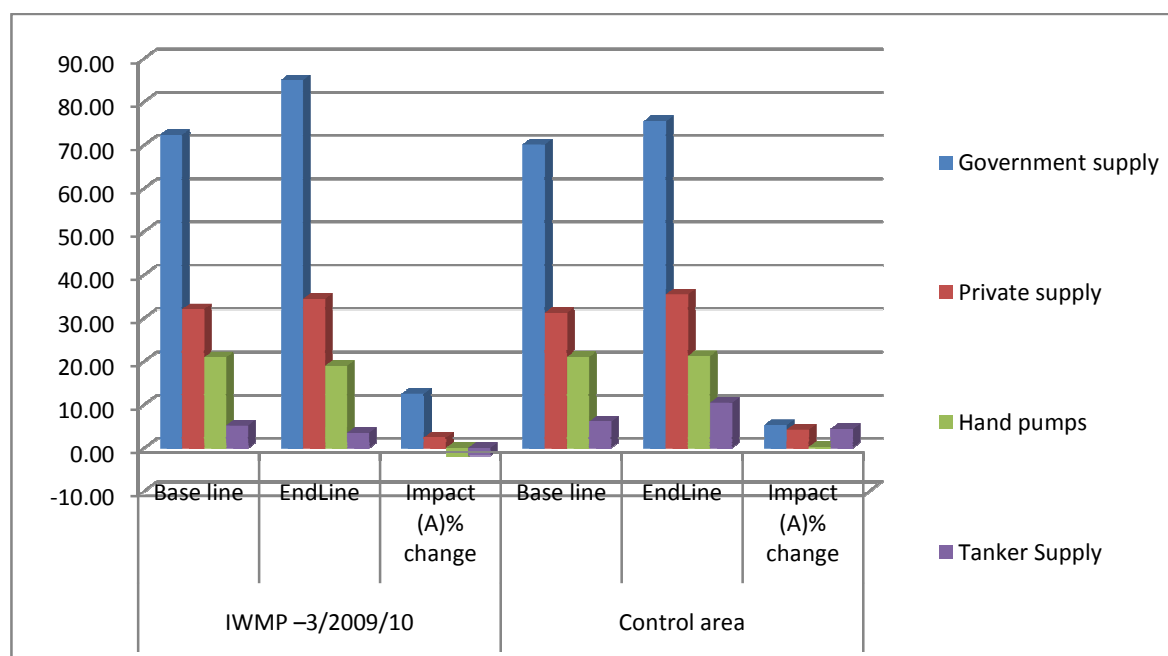
In control area, at the final impact evaluation stage, the changes in drinking water facilities were monitored. It was observed that there is an increase of **5.34%** in Government Supply, increase of **4.25%** in private supply, increase of **0.22%** in hand pumps, increase of **4.38%** in tanker supply.

Drinking water Facilities in IWMP Watershed and Control Area (%):

Table: 10.4

IWMP/ Control Area	Timeline	Government supply	Private supply	Hand pumps	Tanker Supply
1	2	4	5	5	6
IWMP-3 /2009-10	Base line	72.41	32.06	20.94	5.23
	End line	85.00	34.50	19.00	3.50
	Impact / change	12.59	2.44	-1.94	-1.73
Control area	Base line	70.16	31.25	21.03	6.12
	End line	75.50	35.50	21.25	10.50
	Impact / change	5.34	4.25	0.22	4.38

Source: survey by MEL&D agency



10.3 Soil and Water Conservation and Environmental aspects:

10.3.1 Soil and Water Conservation

It is observed that major expenditure in IWMP Jhunjhunu-3/2009-10 watersheds is done on field bunds on farmers' fields, Anicuts, Check Dams and Nallah Bunds. Field bund & Nallah bund **reduces water runoff and controls soil erosion**. It is evident from the table No. 5.3 in chapter 5 that total capacity of rain water harvesting of all NRM activities (soil & Water Conservation measures) in the IWMP watershed is **2001 Thousands CUM**. With the implementation of such watershed activities, total **3628** families have been benefitted through various activities.

10.3.2 Environmental aspects in IWMP Watershed and Control Area:

In watershed project area, at the final impact evaluation stage, **Hazardous Industry** was not found during Base line as well End line survey, **Flora & Fauna** were found during Baseline as well as End line survey & no **Wild Life sanctuary, Cultural Heritage& Archaeological Site** were found at both stage.

In control area, at the final impact evaluation stage, **Hazardous Industry** was not found during Base line as well End line survey, **Flora & Fauna** were found during Baseline as well as End line survey & no **Wild Life sanctuary, Cultural Heritage& Archaeological Site** were found at both stage..

Environmental aspects in IWMP Watershed and Control Area:

Table: 10.5

IWMP/ Control Area	Timeline	Environmental aspects				
		Hazardous Industry	Flora & Fauna	Wild Life sanctuary	Cultural Heritage	Archaeo- logical Site
1	2	3	4	5	6	7
IWMP-3 /2009-10	Base line	N	Y	N	N	N
	End line	N	Y	N	N	N
	Impact / change	0	0	0	0	0
Control area	Base line	N	Y	N	N	N
	End line	N	Y	N	N	N
	Impact / change	0	0	0	0	0

Source: survey by MEL&D agency

10.3.3Bio-diversity in IWMP Watershed and Control Area:

In watershed project area, at the final impact evaluation stage, **Non-brows able tree species, Minor Plants, Fruit Plants** were found available during Base line and End Line stages. **Medicinal Plants and Rejuvenation of local spices of trees** were not found during Base Line but found available in End Line stage.

In control area, at the final impact evaluation stage, **Non-brows able tree species, Minor Plants, Fruit Plants** were found available during Base line and End Line stages. No any **Medicinal Plants & Rejuvenation of local spices of trees** were found in Base Line & in End Line stage.

Bio-diversity in IWMP Watershed and Control Area:

Table: 10.6

IWMP/ Control Area	Timeline	Bio-diversity				
		Non- browsable tree species	Minor Plants	Fruit Plants	Medicinal Plants	Rejuvenation of local spices of trees
1	2	3	4	5	6	7
IWMP-3 /2009-10	Base line	Y	Y	Y	N	N
	End line	Y	Y	Y	Y	Y
	Impact / change	0	0	0	100	100
Control area	Base line	Y	Y	Y	N	N
	End line	Y	Y	Y	N	N
	Impact / change	0	0	0	0	0

Source: survey by MEL&D agency

10.3.4 Ground water source, yield and level in IWMP Watershed and Control

Area:

In watershed project area, at the final impact evaluation stage, the sources of ground water and level were monitored. There was **no change** in number of **dry wells**; **functional wells** were increased by **6.72%**. The **average water level** in meters was reported to be increased by **0.55%** in June, **0.50%** in October and **0.54%** in January.

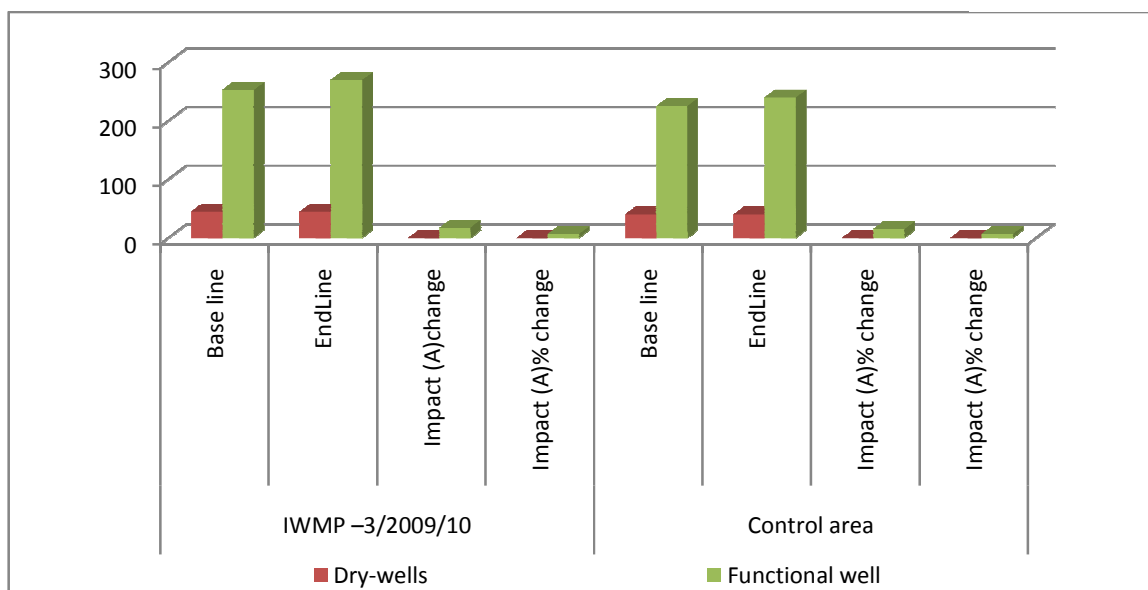
In control area, at the final impact evaluation stage, the sources of ground water and level were monitored. The **dry wells** numbers were not change, **functional wells** were increased by **6.67%**. The **average water level** in meters was reported to be increased by **1.46%** in June, **1.56%** in October and **1.48%** in January. The impact of intervention is visible as the water levels are decreased in IWMP area.

Ground water source, yield and level in IWMP Watershed and Control Area (%):

Table: 10.7

IWMP/ Control Area	Timeline	Dry-wells	Functional well	Avg. Water level in meters		
		No.	No.	June	October	January
1	2	3	4	8	9	10
IWMP-3 /2009-10	Base line	45	253	76.5	76.32	76.41
	EndLine	45	270	76.92	76.7	76.82
	Impact (A)change	0	17	0.42	0.38	0.41
	Impact (A)% change	0.00	6.72	0.55	0.50	0.54
Control area	Base line	40	225	75.25	75.05	75.2
	EndLine	40	240	76.35	76.22	76.31
	Impact (A)% change	0	15	1.1	1.17	1.11
	Impact (A)% change	0.00	6.67	1.46	1.56	1.48

Source: survey by MEL&D agency



10.4 Agriculture Aspects:

10.4.1 Cropping Pattern - Total Cultivation Land, Irrigated Area & Cropped area in IWMP Watershed and Control Area (ha/%):

In watershed project area, at the final impact evaluation stage, the **Total Cultivated Land** is increased by **21.22%** (from 1885 ha to 2285 ha) in Kharif, increased by **8.00%** (from 375 ha to 405 ha) in Rabi, increased by **6.67%** (from 105 ha to 112 ha) in Jayad, the **Total Irrigated Area** is increased by **27.03%** (from 185 ha to 235 ha) in Kharif, increased by **26.67%** (from 225 ha to 285 ha) in Rabi, increased by **6.67%** (from 105 ha to 112 ha) in Jayad. The **Total Cropped Area** for single crop is increased by **24.50%** (from 1510 Ha to 1880 Ha) while for double crop it is increased by **7.71%** (from 480 ha to 517ha), and for multiple crop, it is increased by **44.44%** (from 450 ha to 650 ha).

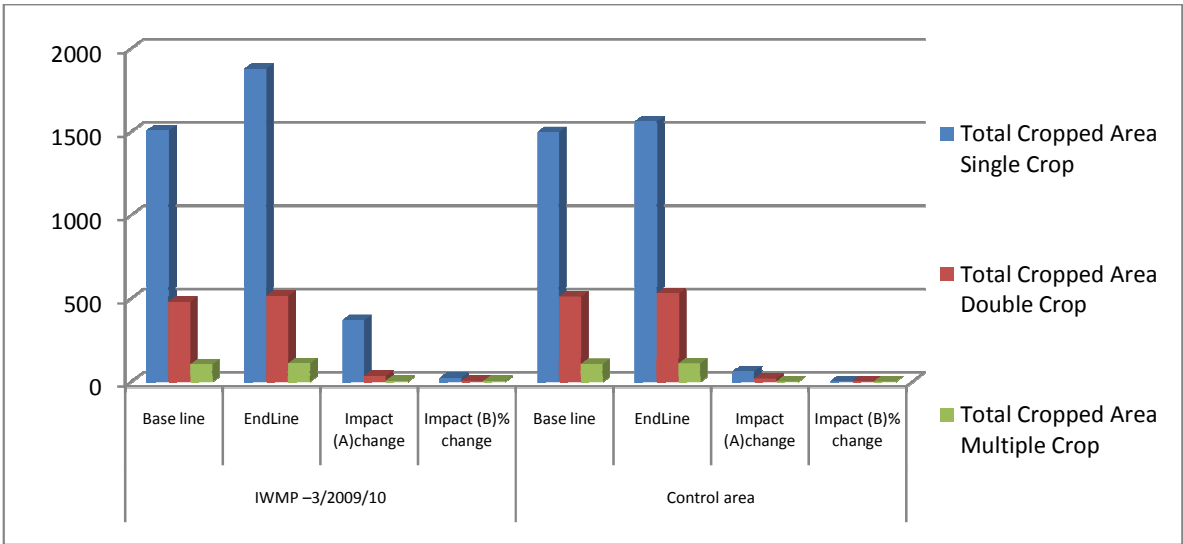
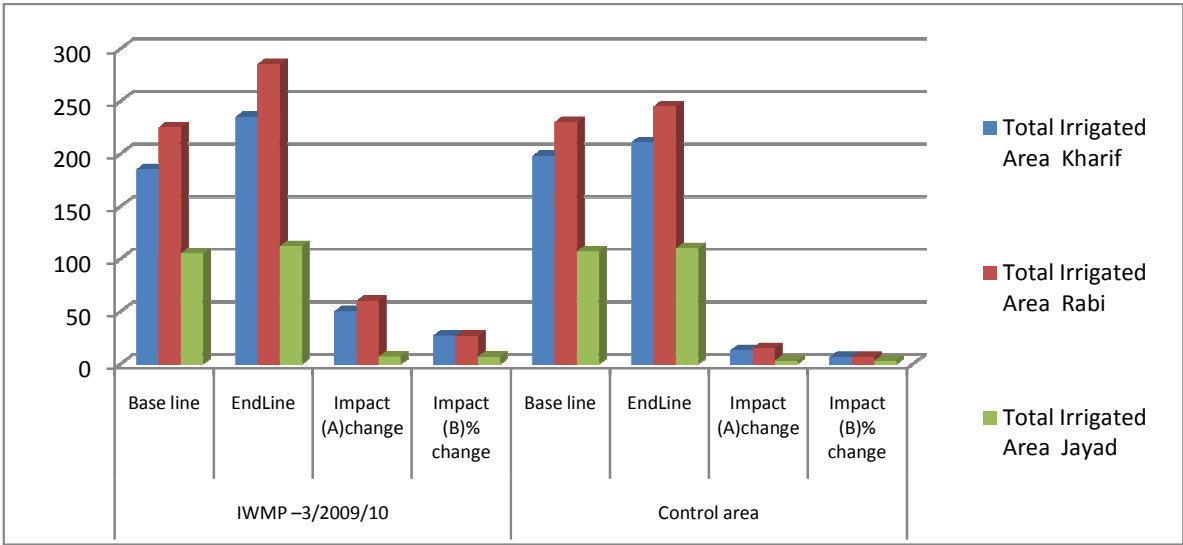
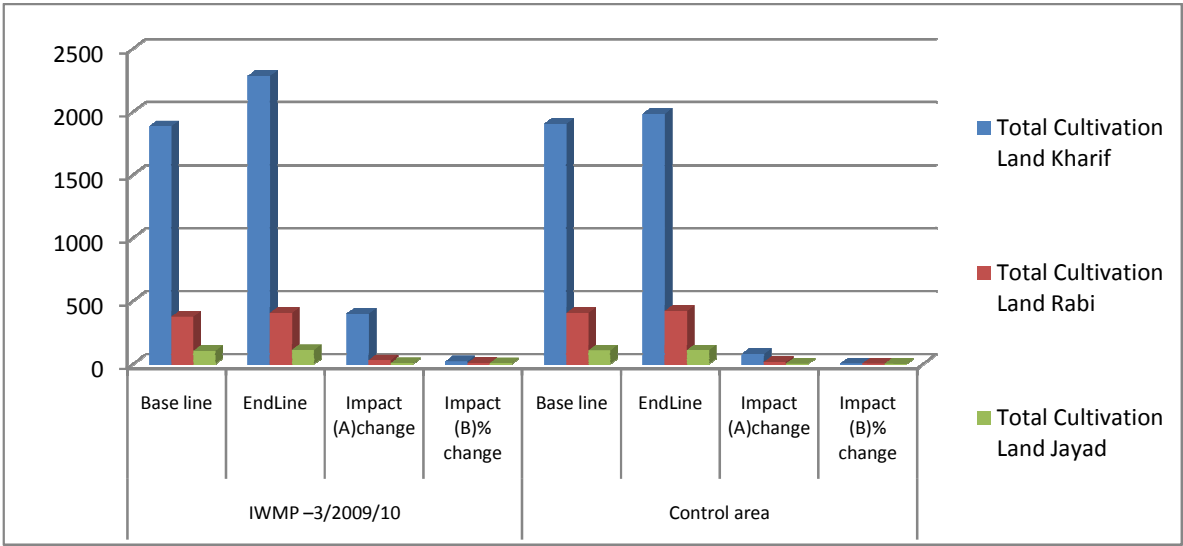
In control area, at the final impact evaluation stage, the **Total Cultivated Land** is increased by **4.20%** (from 1905 ha to 1985 ha) in Kharif, increased by **3.95%** (from 405 ha to 421 ha) in Rabi, increased by **2.80%** (from 107 ha to 110 ha) in Jayad, the **Total Irrigated Area** is increased by **6.57%** (from 198ha to 211 ha) in Kharif, increased by **6.52%** (from 198 ha to 211 ha) in Rabi, increased by **2.80%** (from 107 ha to 110 ha) in Jayad, the **Total Cropped Area** for single crop is increased by **4.27%** (from 1500 Ha to 1564 Ha) while for double crop it is increased by **3.71%** (from 512 ha to 531ha), and for multiple crop, it is increased by **2.80%** (from 107 ha to 110 ha) in Jayad.

Cropping Pattern - Total Cultivation Land, Irrigated Area & Cropped area in IWMP Watershed and Control Area (ha/%)

Table: 10.8

IWMP/ Control Area	Timeline	Total Cultivation Land			Total Irrigated Area			Total Cropped Area		
		Kharif	Rabi	Jayad	Kharif	Rabi	Jayad	Single Crop	Double Crop	Multiple Crop
1	2	3	4	5	6	7	8	9	10	11
IWMP- 3/2009-10	Base line	1885	375	105	185	225	105	1510	480	105
	End line	2285	405	112	235	285	112	1880	517	112
	Impact / change (ha)	400	30	7	50	60	7	370	37	7
	Impact / % change	21.22	8.00	6.67	27.03	26.67	6.67	24.50	7.71	6.67
Control area	Base line	1905	405	107	198	230	107	1500	512	107
	End line	1985	421	110	211	245	110	1564	531	110
	Impact / change (ha)	80	16	3	13	15	3	64	19	3
	Impact / % change	4.20	3.95	2.80	6.57	6.52	2.80	4.27	3.71	2.80

Source: survey by MEL&D agency



10.4.2 Season-wise & Crop-wise area in IWMP Watershed & Control Area

(ha/%):

In watershed project area, at the final impact evaluation stage, the **Season-wise & Crop-wise area in Kharif**, is increased by **23.15%** (from 1015 ha to 1250 ha) for Bajra, increased by **18.97%** (from 870 ha to 1035 ha) for others, increased by **21.22%** (from 1885 ha to 2285 ha) as total, **in Rabi**, increased by **9.09%** (from 275 ha to 300 ha) for wheat, increased by **5.00%** (from 100 ha to 105 ha) for others & increased by **8.00%** (from 375 ha to 405 ha) as total, **in Jayad**, area increased by **6.67%** (from 105 ha- 112 ha) .

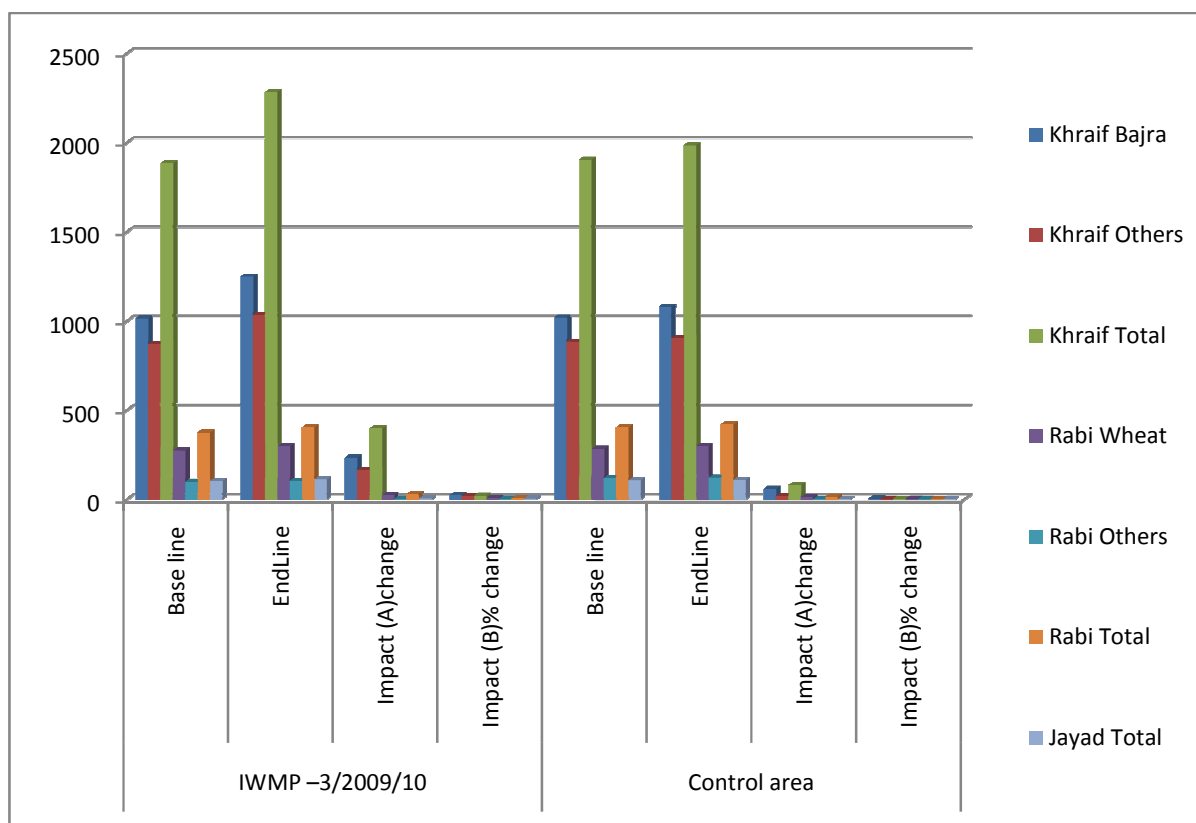
In control area, at the final impact evaluation stage, the **Season-wise and Crop-wise area in Kharif**, is increased **5.88%** (from 1020 ha to 1080 ha) for Bajra, increased by **2.26%** (from 885 ha to 905 ha) for others, increased by **4.20%** (from 1905 ha to 1985 ha) as total, **in Rabi**, is increased by **4.56%** (from 285 ha to 298 ha) for Wheat, increased by **2.50%** (from 120 ha to 123 ha) for others and increased by **3.95%** (from 405 ha to 421 ha) as total, **in Jayad**, area increased by **2.80%** (from 107 ha to 110 ha) .

Season-wise & Crop-wise area in IWMP Watershed and Control Area (ha/%):

Table: 10.9

IWMP/ Control Area	Timeline	Kharif			Rabi			Jayad
		Bajra	Others	Total	Wheat	Others	Total	Total
IWMP – 3/2009/10	Base line	1015	870	1885	275	100	375	105
	EndLine	1250	1035	2285	300	105	405	112
	Impact change	235	165	400	25	5	30	7
	Impact % change	23.15	18.97	21.22	9.09	5.00	8.00	6.67
Control area	Base line	1020	885	1905	285	120	405	107
	EndLine	1080	905	1985	298	123	421	110
	Impact change	60	20	80	13	3	16	3
	Impact % change	5.88	2.26	4.20	4.56	2.50	3.95	2.80

Source: survey by MEL&D agency



10.4.3 Adoption of new package of practices in IWMP Watershed & Control

Area (%):

In watershed project area, at the final impact evaluation stage, the impact on percentage households on adoption of new packages of practices is found as increase of **7%** on use of certified seeds, increase of **10%** on use of hybrid seeds, increase of **19%** on use of culture, decrease of **7%** on use of pesticides, decrease of **4%** on use of insecticides, decrease of **5%** on use of fertilizers, **no change** on use of manures, increase of **7.50%** on use of vermi compost, increase of **3%** on use of compost.

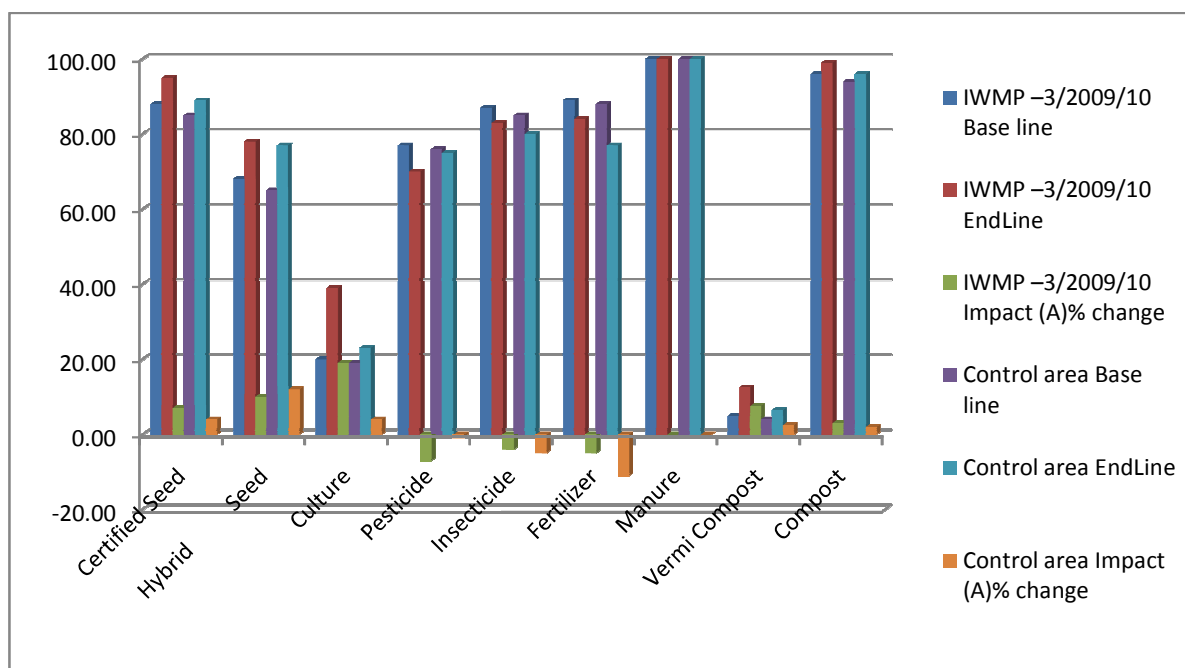
In control area, at the final impact evaluation stage, the impact on percentage households on adoption of new packages of practices is found as increase of **4%** on use of certified seeds, increase of **12%** on use of hybrid seeds, increase of **4%** on use of culture, decrease of **1%** on use of pesticides, decrease of **5%** on use of insecticides, decrease of **11%** on use of fertilizers, **no change** on use of manures, increase of **2.50%** on use of vermi compost, increase of **2%** on use of compost.

Adoption of new package of practices in IWMP Watershed and Control Area (%):

Table: 10.10

IWMP/ Control Area	Timeline	Certi- fied Seed	Hybrid Seed	Culture	Pesticide	Insecticide	Fertilizer	Manure	Vermi Compost	Compost
1	2	3	4	5	6	7	8	9	10	11
IWMP- 3/2009- 10	Base line	88.00	68.00	20.00	77.00	87.00	89.00	100.00	5	96
	End line	95.00	78.00	39.00	70.00	83.00	84.00	100.00	12.50	99.00
	Impact / change	7.00	10.00	19.00	-7.00	-4.00	-5.00	0.00	7.50	3.00
Control area	Base line	85.00	65.00	19.00	76.00	85.00	88.00	100.00	4	94
	End line	89.00	77.00	23.00	75.00	80.00	77.00	100.00	6.50	96.00
	Impact / change	4.00	12.00	4.00	-1.00	-5.00	-11.00	0.00	2.50	2.00

Source: survey by MEL&D agency



10.4.4 Average Crop Yield / Productivity in IWMP Watershed & Control Area (unit/%):

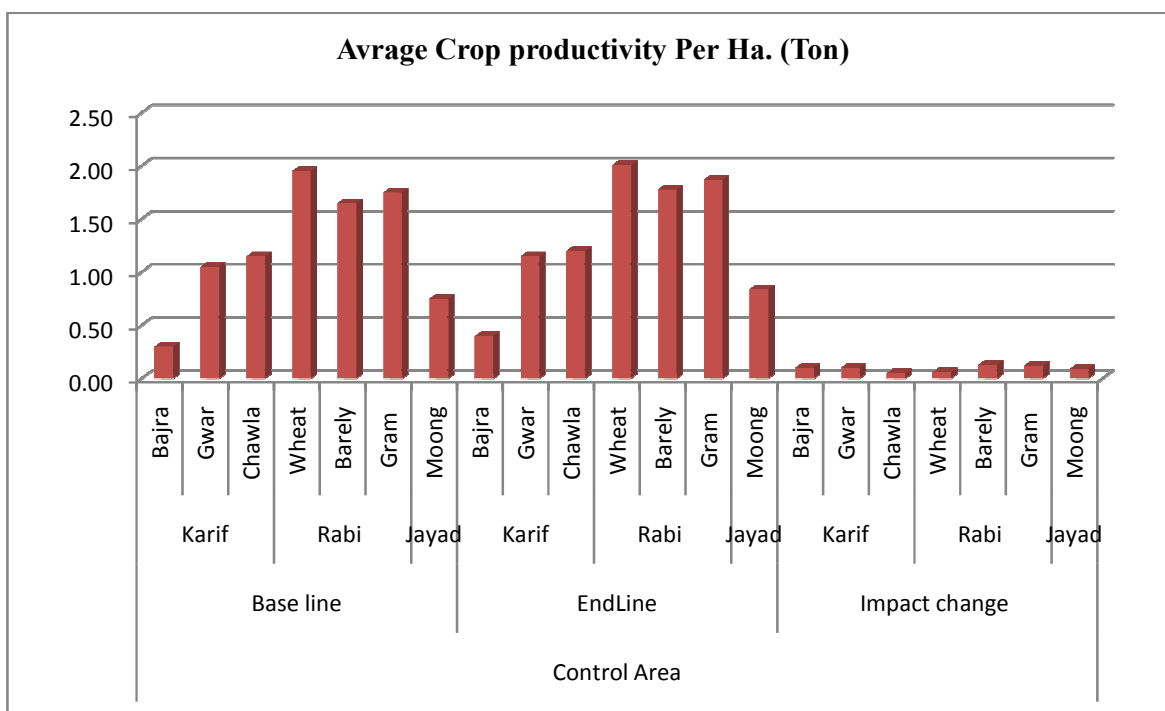
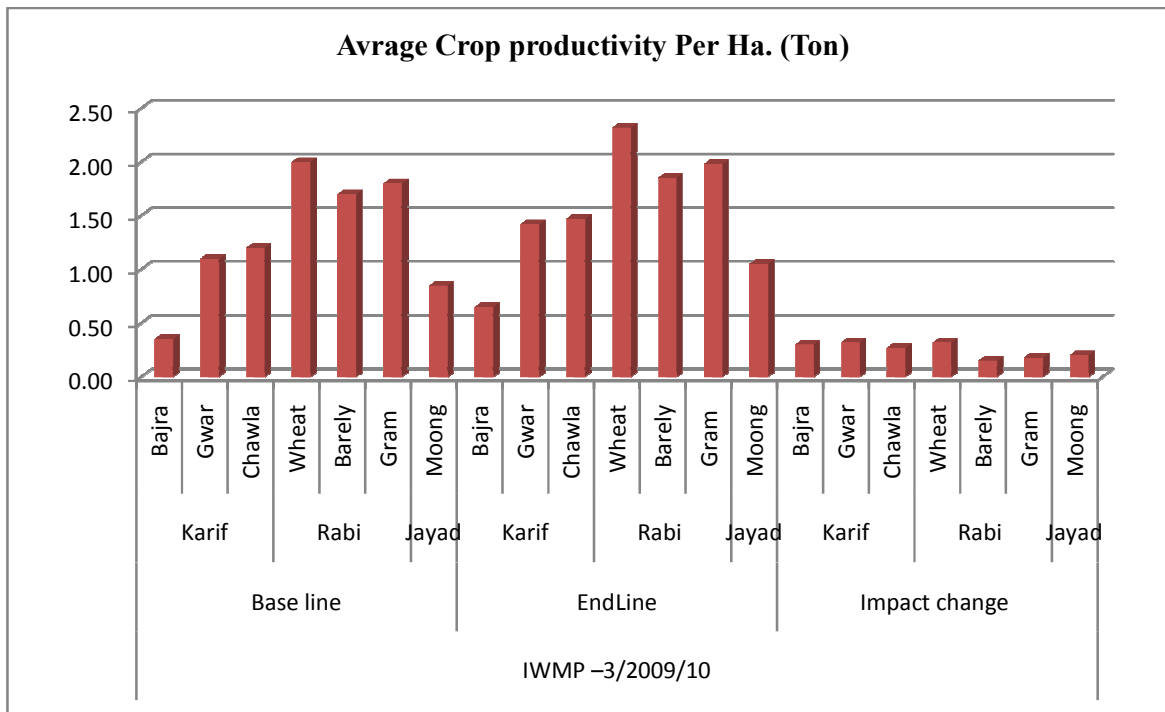
In watershed project area, at the final impact evaluation stage, the impact on a) **Crop-wise Average Crop Yield / Productivity and b)** is described in table given below.

**Average Crop Yield / Productivity in IWMP Watershed & Control Area
(unit/%):**

Table: 10.11

IWMP/ Control Area	Timeline	Season	Crop Type	Average Crop productivity Ton Per Ha.	
IWMP – 3/2009-10	Base Line	Kharif	Bajra	0.35	
			Gwar	1.10	
			Chawla	1.20	
		Rabi	Wheat	2.00	
			Barely	1.70	
			Gram	1.80	
		Jayad	Moong	0.85	
		EndLine	Kharif	Bajra	0.65
				Gwar	1.42
	Chawla			1.47	
	Rabi		Wheat	2.32	
			Barely	1.85	
			Gram	1.98	
	Jayad		Moong	1.05	
	Impact (A)% change		Kharif	Bajra	0.30
				Gwar	0.32
		Chawla		0.27	
		Rabi	Wheat	0.32	
			Barely	0.15	
			Gram	0.18	
		Jayad	Moong	0.20	
Control Area		Base Line	Kharif	Bajra	0.30
				Gwar	1.05
	Chawla			1.15	
	Rabi		Wheat	1.95	
			Barely	1.65	
			Gram	1.75	
	Jayad		Moong	0.75	
	EndLine		Kharif	Bajra	0.40
				Gwar	1.15
		Chawla		1.20	
		Rabi	Wheat	2.01	
			Barely	1.78	
			Gram	1.87	
		Jayad	Moong	0.84	
		Impact (A)% change	Kharif	Bajra	0.10
				Gwar	0.10
	Chawla			0.05	
	Rabi		Wheat	0.06	
			Barely	0.13	
			Gram	0.12	
	Jayad		Moong	0.09	

Source: survey by MEL&D agency



10.5 Economic Aspects:

10.5.1 Average Annual Income by source in IWMP Watershed and Control Area (Rs./%)

In watershed project area, at the final impact evaluation stage, the average annual income in Agriculture and Livestock sector was increased by **26.64%** (from Rs. 23890/- to 30254/-) per household, as wage employment, it is increased by **23.63%** (from 23850/- to 29487/-), as migration it is increased by **14.94%**(35080/- to 40321/-), in small enterprises, increased by **14.22%** (153950/- to 175842/-) and from services increased by **14.18%**(259100/- to 295841/-).

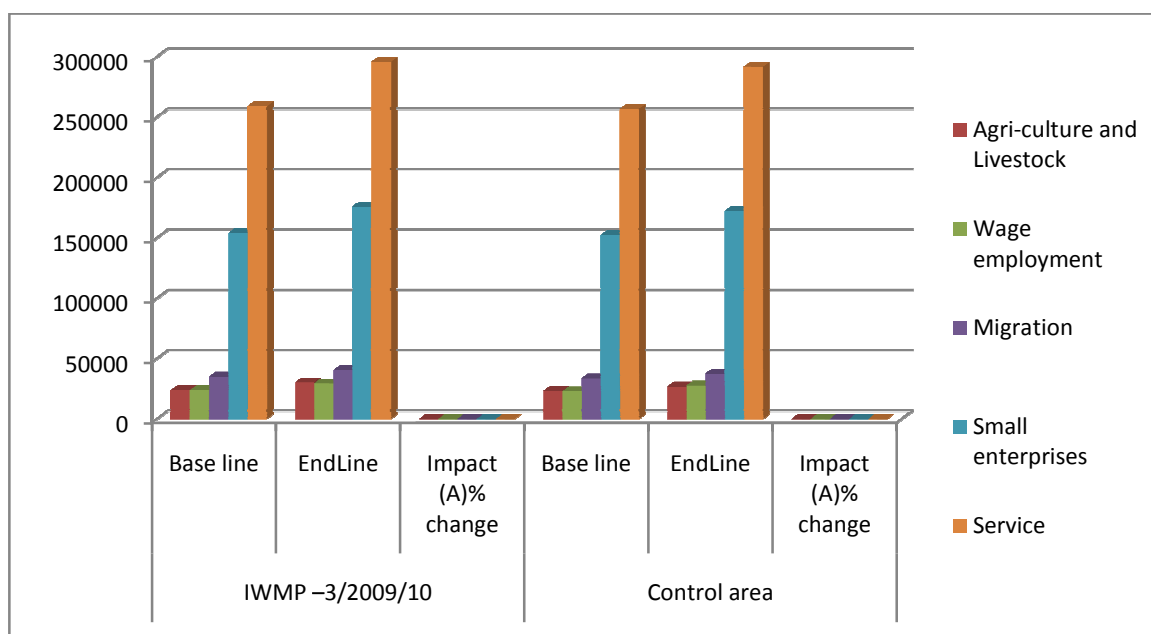
In control area, at the final impact evaluation stage, the average annual income in Agriculture and Livestock sector was increased by **15.97%** (from Rs. 23150/- to 16847/-) per household, as wage employment, it is increased by **20.60%** (from 22930/- to 27654/-), as migration it is increased by **11.58%**(33670/- to 37569/-), in small enterprises, increased by **13.03%** (152400/- to 172254/-) and from services increased by **13.65%**(256700/- to 291745/-).

Average Annual Income by source in IWMP Watershed and Control Area (Rs./%):

Table: 10.12

IWMP/ Control Area	Timeline	Agriculture and Livestock	Wage employment	Migration	Small enterprises	Service
1	2	3	4	5	6	7
IWMP- 3/2009-10	Base line	23890	23850	35080	153950	259100
	End line	30254	29487	40321	175842	295841
	Impact / % change	26.64	23.63	14.94	14.22	14.18
Control area	Base line	23150	22930	33670	152400	256700
	End line	26847	27654	37569	172254	291745
	Impact / % change	15.97	20.60	11.58	13.03	13.65

Source: survey by MEL&D agency



10.5.2 Average Annual Expenditure on items in IWMP Watershed and Control Area (%):

In watershed project area, at the final impact evaluation stage, the average annual expenditure on different items was reported on Food; an increase of **4.17%** (34100/- to 35523/-), on Cloths; an increase of **8.05%** (19620/- to 21200/-), on Education; an increase of **30.76%**(6730/- to 8800/), on Health, an decrease of **8.33%** (3000/- to 2750/-), on Agriculture, an increase of **5.07%** (22080/- to 23200/-), on Household asserts, an increase of **12.18%**(3120/- to 3500/-), on Livestock; an increase of **7.46%** (21270/- to 23200/-), on Conveyance; an increase of **10.73%** (2890/- to 3200/-) and on others; an increase of **11.49%** (2960/- to 3300/-).

In control area, at the final impact evaluation stage, the average annual expenditure on different

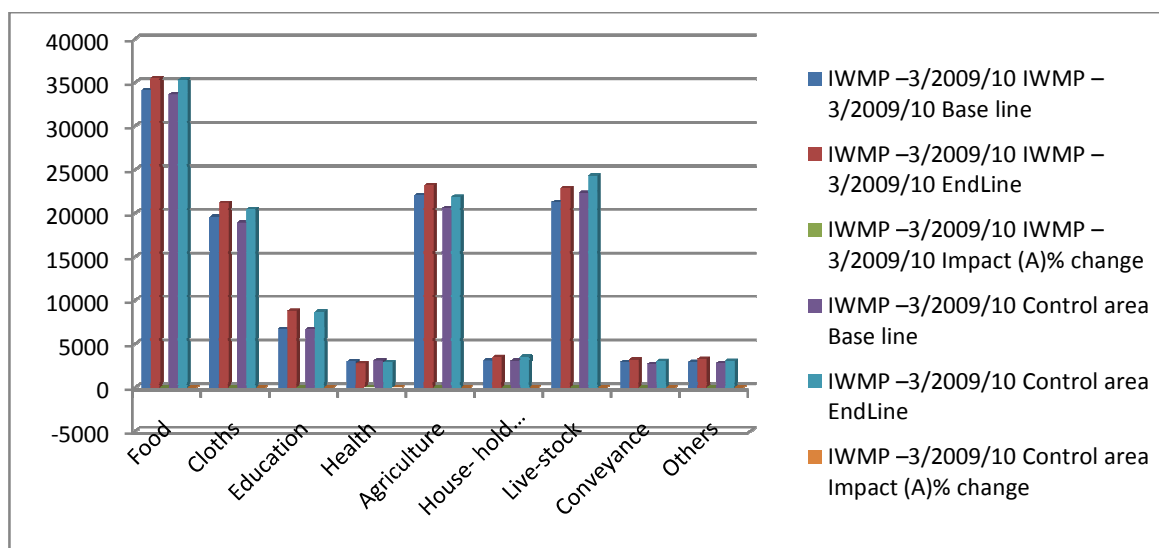
items was reported on Food; an increase of **4.97%** (33640/- to 35312/-), on Cloths; an increase of **8.35%** (18920/- to 20500/-), on Education; an increase of **29.27%** (6730/- to 8700/-), on Health, an decrease of **7.69%** (3120/- to 2880/-), on Agriculture, an increase of **6.17%** (20610/- to 21882/-), on Household asserts, an increase of **15.26%**(3080/- to 3550/-), on Livestock; an increase of **8.73%** (22360/- to 24312/-), on Conveyance; an increase of **12.96%** (2700/- to 3050/-) and on others; an increase of **10.47%** (2770/- to 3060/-).

Average Annual Expenditure on items in IWMP Watershed and Control Area (%):

Table: 10.13

IWMP/ Control Area	Timeline	Food	Cloths	Educa-tion	Health	Agriculture	House-hold Assets	Live-stock	Convey-ance	Others
1	2	3	4	5	6	7	8	9	10	11
IWMP-3/2009-10	Base line	34100	19620	6730	3000	22080	3120	21270	2890	2960
	End line	35523	21200	8800	2750	23200	3500	22856	3200	3300
	Impact / % change	4.17	8.05	30.76	-8.33	5.07	12.18	7.46	10.73	11.49
Control area	Base line	33640	18920	6730	3120	20610	3080	22360	2700	2770
	End line	35312	20500	8700	2880	21882	3550	24312	3050	3060
	Impact / % change	4.97	8.35	29.27	-7.69	6.17	15.26	8.73	12.96	10.47

Source: survey by MEL&D agency



10.5.3 Input and Source in IWMP Watershed and Control Area (%):

In watershed project area, at the final impact evaluation stage, the percentage households taking fertilizer as input are decreased by **8%**(89% to 81%), Pesticides as input increased by **8%**(77% to 85%),Insecticides as input decreased by **4%**(87% to 83%). Market as source for the input decreased by **3.46%** households (53.36% to 49.9%), Cooperatives as source for the input decreased by **7.81%** households (43.03% to 35.22%),Self-Produced as source for the input increased by **5.07%** households (29.03% to 34.10%) and Neighbourer as source for the input increased by **5.60%** households (10.00% to 15.60%). In control area, at the final impact evaluation stage, the percentage households taking fertilizer as input are increased by **1.50%**

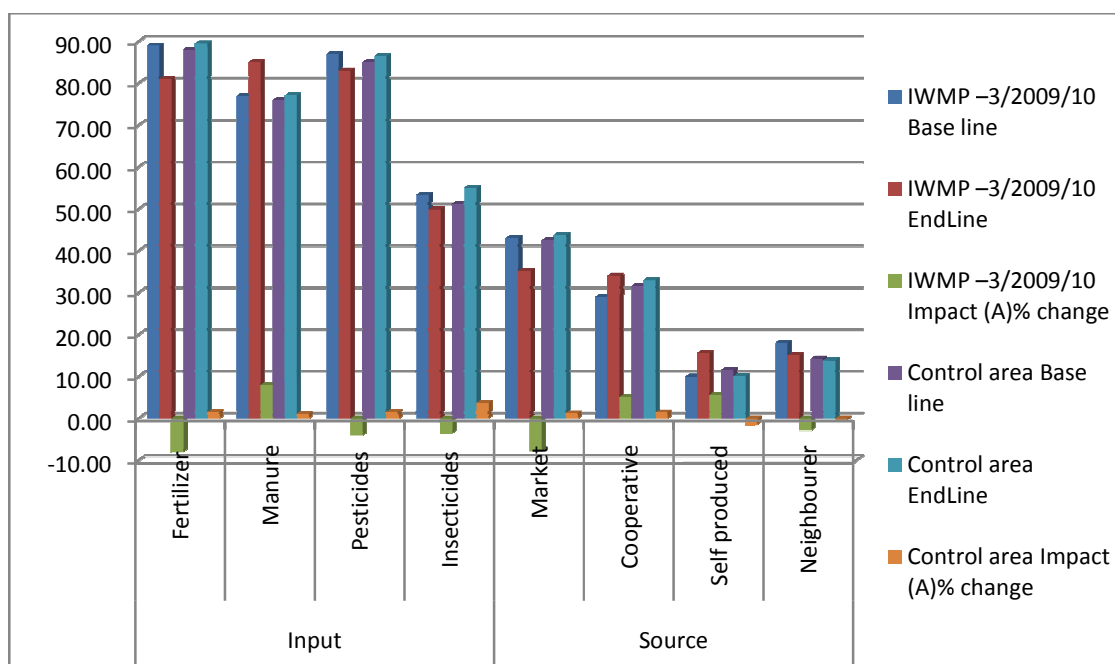
(88.00% to 89.50%), Pesticides as input increased by **1.10%** (76.00% to 77.10%), Insecticides as input increased by **1.50%** (85.00% to 86.50%). Market as source for the input increased by **3.77%** households (51.23% to 55.00%), Cooperatives as source for the input increased by **1.22%** households (42.58% to 43.80%), Self-Produced as source for the input increased by **1.42%** households (31.58% to 33.00%) and Neighbourer as source for the input decreased by **1.46%** households (11.56% to 10.10%).

Input and Source in IWMP Watershed and Control Area (%):

Table: 10.14

IWMP/ Control Area	Time line	Input			Source			
		Fertilizer	Pesticides	Insecticides	Market	Cooperative	Self Produced	Neighbourer
1	2	3	4	5	6	7	8	9
IWMP- 3/2009-10	Base line	89.00	77.00	87.00	53.36	43.03	29.03	10.00
	End line	81.00	85.00	83.00	49.90	35.22	34.10	15.60
	Impact / change	-8.00	8.00	-4.00	-3.46	-7.81	5.07	5.60
Control area	Base line	88.00	76.00	85.00	51.23	42.58	31.58	11.56
	End line	89.50	77.10	86.50	55.00	43.80	33.00	10.10
	Impact / change	1.50	1.10	1.50	3.77	1.22	1.42	-1.46

Source: survey by MEL&D agency



10.5.5 Employment Opportunities in IWMP Watershed & Control Area(%):

In watershed project area, at the final impact evaluation stage, the employment opportunities for the percentage households under different sectors were monitored. It was observed that as Agriculture and Livestock, there is an increase of **4.87%**, as Wage employment, an increase of

2.55%, as migration, a decrease of 1.19%, as small enterprises, an increase of 0.25%, as services, an increase of 0.38%.

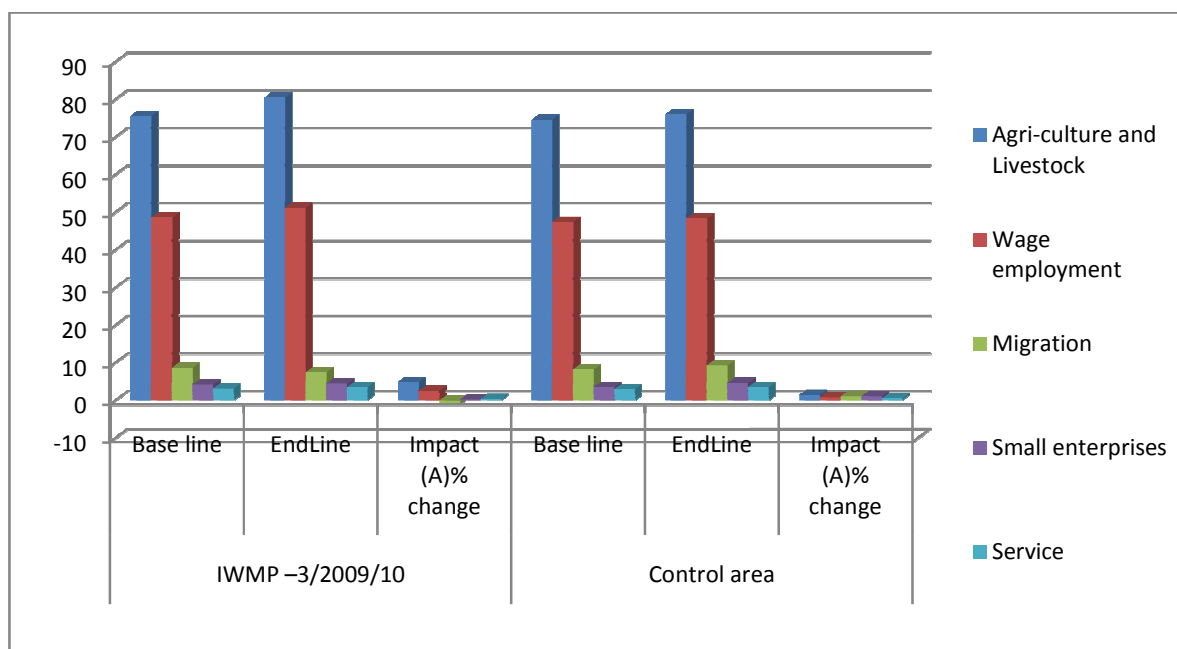
In control area, at the final impact evaluation stage, the employment opportunities for the percentage households under different sectors were monitored. It was observed that as Agriculture and Livestock, there is an increase of 1.48%, as Wage employment, an increase of 0.82%, as migration, a decrease of 1.07%, as small enterprises, an increase of 1.08%, as services, an increase of 0.54%.

Employment Opportunities in IWMP Watershed and Control Area (%)

Table: 10.15

IWMP/ Control Area	Timeline	Agriculture & Livestock	Wage employment	Migration	Small enterprises	Service
1	2	3	4	5	6	7
IWMP- 3/2009-10	Base line	75.63	48.65	8.69	4.25	3.12
	End line	80.5	51.2	7.50	4.5	3.5
	Impact / change	4.87	2.55	-1.19	0.25	0.38
Control area	Base line	74.63	47.52	8.23	3.56	2.96
	End line	76.11	48.34	9.3	4.64	3.5
	Impact / change	1.48	0.82	1.07	1.08	0.54

Source: survey by MEL&D agency



10.5.6 Migration details in IWMP Watershed & Control Area(%):

In watershed project area, at the final impact evaluation stage, the migration of the communities for different purposes was monitored. It was found that for private sector employment, there is an increase of 2.98% households, as daily casual labour, decrease of 2.14%, as Agriculture Labour, and decrease of 0.91% and for business purposes, increase of 0.07%.

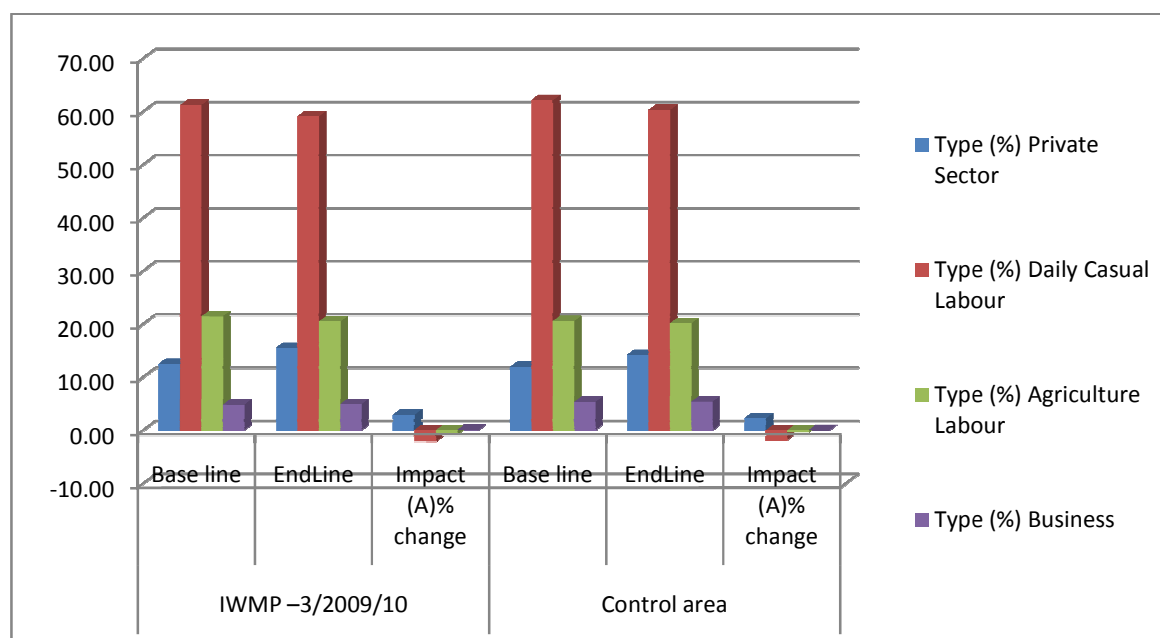
In control area, at the final impact evaluation stage, the migration of the communities for different purposes was monitored. It was found that for private sector employment, there is an increase of **2.24%** households, as daily casual labour, decrease of **1.84%**, as Agriculture Labour, and decrease of **0.43%** and for business purposes, increase of **0.03%**.

Migration details in IWMP Watershed and Control Area (%):

Table: 10.16

IWMP/ Control Area	Timeline	Type (%)			
		Private Sector	Daily Casual Labor	Agriculture Labor	Business
1	2	3	4	5	6
IWMP- 3/2009-10	Base line	12.52	61.22	21.41	4.85
	End line	15.50	59.08	20.50	4.92
	Impact / change	2.98	-2.14	-0.91	0.07
Control area	Base line	11.96	62.14	20.56	5.34
	End line	14.20	60.30	20.13	5.37
	Impact / change	2.24	-1.84	-0.43	0.03

Source: survey by MEL&D agency



10.6 Other Outcomes:

In addition to above, as per the requirement of the department of WD&SC, the outcome of some of the important indicators were also monitored during the Final Impact Evaluation stage in IWMP watershed area and compared with the base line data. The changes noticed are described as under.

In watershed project area, at the final impact evaluation stage, i) the Employment in Agriculture related activities among beneficiaries was increased by **4.1%** (from 72.4% to 76.5%) of total population, ii) Employment in Non- Agriculture Sector was increased by **2.7%** (from 42.5% to

45.2%) of total population, iii) Fuel wood Production was increased by **0.2 tons / hectare per year** (from 1.1% to 1.3%), iv) No. of Milch Cattle was increased by **386 Nos.** (from 3176 to 3562 numbers) and increase in milk production by **1.5 liter per animal per day (LPD)** (from 9.5 LPD to 11 LPD), v) There were no streams in the project area so Duration of flow of water in the streams not monitored, vi) No. of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship were increased by **7 nos.** (from 10 to 17 Nos), vii) Reduction in migration from rural to urban area in the project area is reduced by **1.19%** (from 8.69% to 7.50%) of total population, viii) Annual Mean Household Income increased by **Rs. 6364/-** (from Rs 23890/- to Rs. 30254/-) and ix) No. of children enrolled in schools in the project area **3%** (from 97% to 100%) of total child population.

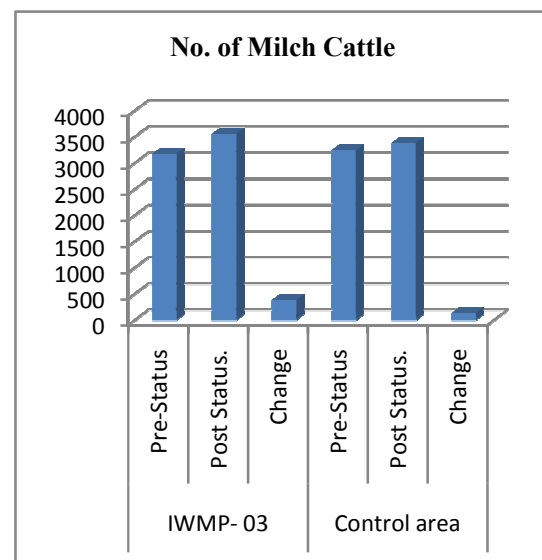
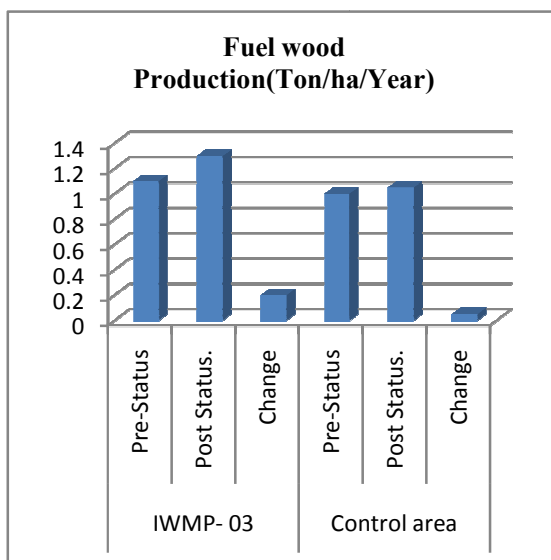
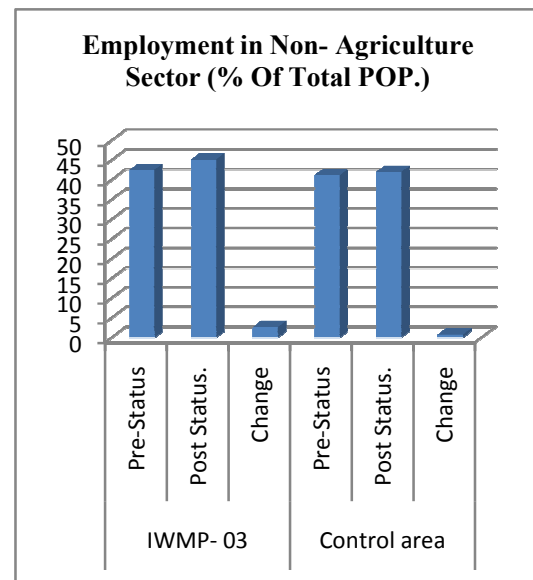
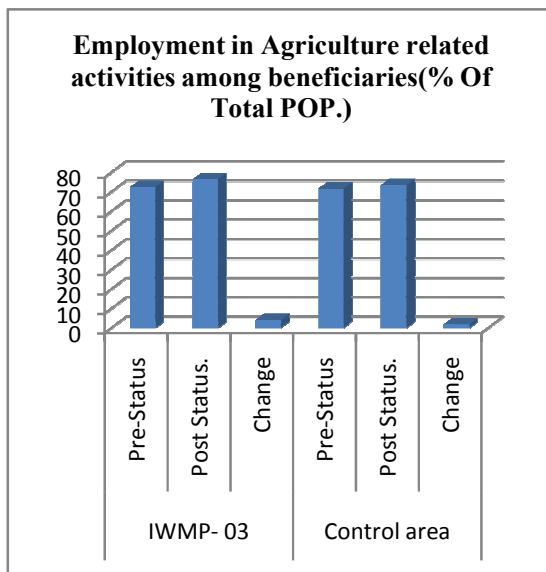
Outcome of important indicators:

Table: 10.17

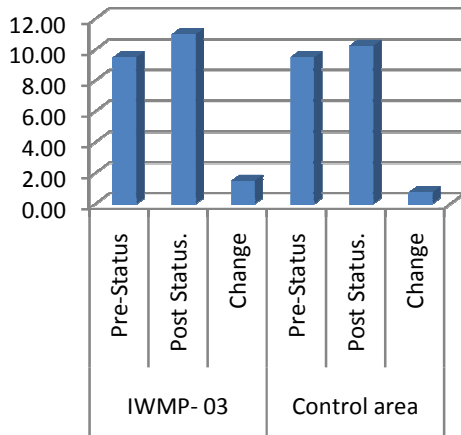
S.no	Items	IWMP- 03			Control area		
		Pre-Status	Post Status.	Change	Pre-Status	Post Status.	Change
1	2	3	4	5	6	7	8
1	Employment in Agriculture related activities among beneficiaries (% Of Total POP.)	72.4	76.5	4.1	71.6	73.5	1.9
2	Employment in Non- Agriculture Sector (% Of Total POP.)	42.5	45.2	2.7	41.2	42	0.8
3	Fuel wood Production(Ton/ha/Year)	1.1	1.3	0.2	1	1.05	0.05
	No. of Milch Cattle	3176	3562	386	3247	3385	138
4	Milk Production Of Milch Cattle (Lit.Per.Animal)	9.50	11.00	1.5	9.50	10.25	0.75
5	Duation of flow of water in the streams(Month)	0	0	0	0	0	0
6	No.of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship (Nos.)	10	17	7	11	14	3
7	Reduction in migration from rural to urban area in the project area (% Of Total POP.)	8.69	7.50	-1.19	8.23	9.3	1.07
8	Annual Mean Household Income (RS.)	23890	30254	6364	23150	26847	3697
9	No. of children enrolled in schools in the project area.(% Of Total Child. POP.)	97	100	3	98	100	2

Source: survey by MEL&D agency

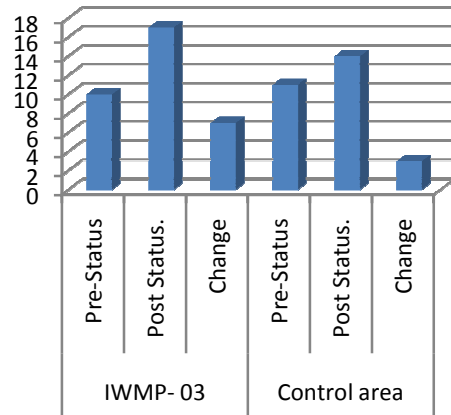
Graphical comparison of these outcomes is as under:



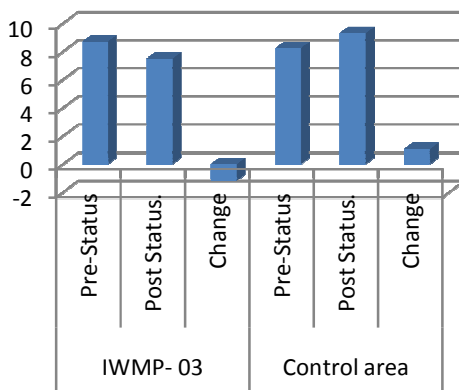
**Milk Production Of Milch Cattle
(Lit.Per.Animal)**



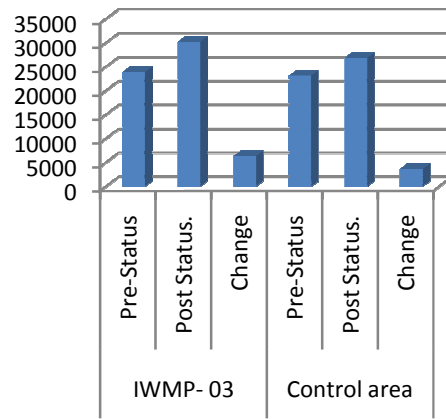
**No.of persons engaged in ancillary
activities like Fisheries, Poultry
and Rural craftmanship (Nos.)**



**Reduction in migration from rural
to urban area in the project area(%
Of Total POP.)**



**Annual Mean Household
Income(RS.)**



**No. of children enrolled in schools
in the project area.(% Of Total
Child. POP.)**

