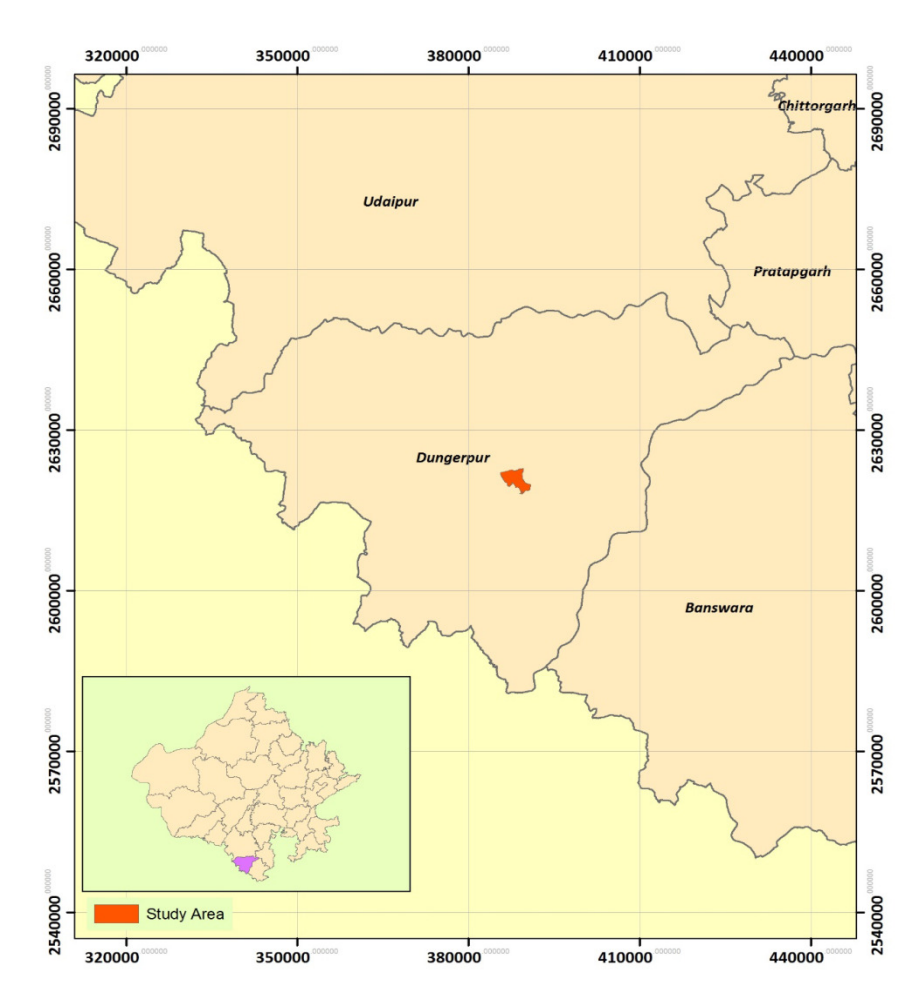
FINAL IMPACT EVALUATION REPORT

(ENDLINE)

DUNGARPUR(IWMP) 4/2010-11

Block-Sagwara, District Dungarpur



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 – 4 2010-11 Dungarpur					
2	Area in Ha.:						4591					
3	Cost (Rs. in Lakhs):						550.92					
4	Total No. of Household in project area:						4590					
5	No. of Household for benchmark study (20%):						918					
6	Control Area in Ha for (Non-project):						4377					
7	Total No. of Household in Control area:						3109					
8	No. of Household for benchmark study (20%) in control area:						622					
9	Area in Ha. for satellite imagery (25%):						1262.96					
	Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	Avg. Annual Rain Fall (mm)	477	810	668	1015	1112	907	629	601	830	952	647

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1	**NRM (Natural Resource Management)**											
1.1	***Increase in under cultivation crop area in Ha.***											
1.1.1	Kharif	1194	1950	756	63.4	1253	1320	67	5.3	646.220	77.104	-569.116

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.1.2	Rabi	824	1275	451	54.8	865	905	40	4.6	422.220	50.377	-371.843
1.1.3	Ziad	80	95	15	18.8	84	88	4	4.8	386.818	46.153	-340.665
1.2	***Area under Irrigation (Ha)***											
1.2.1	Kharif	568	986	418	73.6	596	630	34	5.7	NA		
1.2.2	Rabi	785	1270	485	61.8	825	867	42	5.1			
1.2.3	Ziad	80	95	15	18.8	80	113	33	41.3			
1.3	***Total Cropped Area (Ha)***											
1.3.1	Single Crop	370	675	305.0	82.4	388	415	27	7.0	646.220	77.104	-569.116
1.3.2	Double Crop	904	1370	466.4	51.6	949	993	44	4.6	422.220	50.377	-371.843
1.3.3	Multiple Crop	80	95	15.0	18.8	80	113	33	41.3	386.818	46.153	-340.665
1.4	***Productivity of Crop (Ton/Ha)***											
1.4.1	Kharif	1.85	2.12	0.27	14.6	1.84	1.99	0.15	8.2	NA		
1.4.2	Rabi	2.29	2.55	0.26	11.4	2.27	2.45	0.18	7.9			
1.4.3	Ziad	1.01	1.29	0.28	27.7	0.98	1.12	0.14	14.3			
1.5	***New package of practices %***											
1.5.1	Certified Seed	79.00	94.28	NA	15.3	76.00	83.00	NA	7.0	NA		
1.5.2	Hybrid Seed	72.00	84.25	NA	12.3	71.00	76.15	NA	5.2			
1.5.3	Culture	27.00	45.00	NA	18.0	25.00	35.24	NA	10.2			
1.5.4	Pesticide	68.00	59.75	NA	-8.3	66.00	68.38	NA	2.4			
1.5.5	Insecticide	62.00	56.35	NA	-5.7	59.00	61.10	NA	2.1			

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.5.6	Fertilizer	77.00	73.25	NA	-3.8	75.00	77.12	NA	2.1			
1.5.7	Manure	100.00	100.00	NA	0.0	100.00	100.00	NA	0.0			
1.5.8	Vermi Compost	17.55	27.20	NA	9.7	16.56	22.15	NA	5.6			
1.5.9	Compost	87.45	93.75	NA	6.3	86.86	89.27	NA	2.4			
1.6	***Change in cropping pattern***											
1.6.1	Barani cropped Area (Ha)	824	1275	451	54.8	865	905	40	4.6	NA		
1.6.2	Irrigated cropped Area (Ha)	865	1365	500	57.8	905	980	75	8.3			
1.6.3	Single cropped Area (Ha)	370	675	305	82.4	388	415	27	7.0	646.220	77.104	-569.116
1.6.4	Double cropped Area (Ha)	904	1370	466	51.6	949	993	44	4.6	422.220	50.377	-371.843
1.6.5	Multiple cropped Area (Ha)	80	95	15	18.8	80	113	33	41.3	386.818	46.153	-340.665
1.6.6	Fellow cropped area (Ha.)	110	135	25	22.7	95	107	12	12.6	140.424	16.755	-123.669
1.7	***Improvement* of Bio- mass**											
1.7.1	Agro Horticulture in Ha.	37	50	13	35.1	23	30	7	30.4	NA		
1.7.2	Agro Forestry in Ha.	1194	1950	756.34	63.4	1253	1320	67	5.3			
1.8	***Change in diversification into crop Ha.***											
1.8.1	Mono Cropped in Ha.	370	675	305	82.4	388	415	27	7.0	NA		
1.8.2	Inter Cropped in Ha.	904	1370	466	51.6	949	993	44	4.6			
1.8.3	Mixed Cropped in Ha.	80	95	15	18.8	80	113	33	41.3			
1.9	***Change in commercial crops in Ha.***											

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.9.1	**Pulses (Ha)**	53	81	28	52.8	40	55	15	37.5	NA		
1.9.2	**Till (Ha)**	24	35	11	45.8	19	28	9	47.4			
1.9.3	**Mustard (Ha)**	452	682	230	50.9	462	478	16	3.5			
1.9.4	**Spices (Ha)**	31	50	19	61.3	23	33	10	43.5			
1.9.5	**Others (Ha)**	238	373	135	56.7	215	287	72	33.5			
1.10	**Increase in cropping intensity in %**											
1.10.1	Kharif	47.58	95.31	NA	47.7	47.57	95.38	NA	47.8	NA		
1.10.2	Rabi	50.56	99.61	NA	49.0	47.73	95.80	NA	48.1			
1.11	**Land use Land Cover distribution and its changes (Ha.)**											
1.11.1	Agricultural	NA								808.26	822.05	13.79
1.11.2	Built Up									37.67	40.09	2.42
1.11.3	Forest									0.00	0.00	0.00
1.11.4	Wastelands									262.09	245.11	-16.99
1.11.5	Wetland									0.00	0.00	0.00
1.11.6	Water Bodies									154.94	155.72	0.78

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.11.7	**Total**									1262.96	1262.96	0.00
1.12	**Change in Forest/green cover in Ha.**											
1.12.1	Forest Blanks	NA								0.0	0.0	0.0
1.12.2	Crop Land in Forest									0.0	0.0	0.0
1.12.3	Scrub Forest									0.0	0.0	0.0
1.12.4	**Total**									0.0	0.0	0.00
1.13	**Change in Waste Lands in Ha.**											
1.13.1	Barren Rocky/Stony waste/Sheet Rock	NA								0.0	0.0	0.0
1.13.2	Gullied/Ravenous Land									0.0	0.0	0.0
1.13.3	Land with scrub									100.0	167.9	67.9
1.13.4	Land without scrub									162.1	77.2	-84.9
1.13.5	Salt Affected Land									0.0	0.0	0.0
1.12.4	Total									262.1	245.1	-17.0
1.14	**Difference of Area Vegetation Index**											

S. No.	Particulars	As per Benchmark Study (Unit/%)								As per satellite imagery		
		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
1.14.1	Nil - Low	NA								30.7	55.7	24.9
1.14.2	Low - Mod.									664.8	582.4	-82.5
1.14.3	Mod.- High									353.6	279.5	-74.0
1.14.4	Very High									213.8	345.4	131.6
1.15	**Soil Moisture Content and Availability through Wetness Index/ Moisture Index**											
1.15.1	Nil - Low	NA								309.8	439.3	129.5
1.15.2	Low - Mod.									895.7	754.1	-141.6
1.15.3	Mod.- High									32.9	23.7	-9.2
1.15.4	Very High									24.5	45.9	21.3
1.16	**Transformation from seasonal to perennial crops in Ha.(Land use diversification)**	NA								Annual Crops (202.41)	Perennial Crops	26.32
										Waste lands (262.09)	Agricultural	16.95

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
										Agricultural	Built Up/Waterbodies	3.16
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										
1.2	**Reduction in silt deposition**	NA										
2	**Water Resources**											
2.1	**Improvement in groundwater level in mtrs.**	33.42	32.75	0.67	2.00	33.13	33.62	-0.49	-1.48	NA		
2.2	**Increase in no. of water bodies**	45	1751	1706	3791.11	NA				NA		
2.3	**Increase in surface water Storage in TCM**	35.21	586.21	551	1564.90					NA		
2.4	**Increase Drinking Water Facilities (% HHs)**									NA		
2.4.1	Government supply	44.58	47.65	NA	3.07	46.42	48.32	NA	1.90	NA		
2.4.2	Private supply	41.28	43.39	NA	2.11	42.68	44.29	NA	1.61			
2.4.3	Hand pumps	30.58	28.75	NA	-1.83	31.68	33.12	NA	1.44			
2.4.4	Tanker Supply	9.48	8.21	NA	-1.27	10.25	11.27	NA	1.02			
2.5	**Water availability:**									NA		
2.5.1	Availability of Drinking Water (Month)	11	12	0	NA	11	12	0	NA	NA		

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
2.5.2	Percentage of no. of families that move to different distances to fetch water (%)	3.7	3.1	-0.6	NA	3.79	4.26	0.47	NA			
2.5.3	No. of dead hand pumps (Hand Pump Rejuvenated)	26	26	0	NA	20	26	6	NA			
3	**Livestock**											
3.1	**Increase in no. of improved breeds**											
3.1.1	Cow	2249	2912	663	29.48	2267	2615	348	15.35	NA		
3.1.2	Buffalos	3108	3995	887	28.54	3103	3502	399	12.85			
3.1.3	Goat	4116	4557	441	10.72	4126	4454	328	7.95			
3.2	**Increase in milk production/ DairyActivities (Kg/day)**											
3.2.1	Cow	6.25	8.25	2	32.00	5.25	6.75	1.5	28.57	NA		
3.2.2	Buffalos	8.5	10.50	2	23.53	7.5	8.50	1	13.33			
3.2.3	Goat	2	3.00	1	50.00	2	2.50	0.5	25.00			
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		
3.5	**Rare/Endangered species of flora and fauna**	NA										
3.6	**Indigenous knowledge, artefacts, traditional values**	NA										

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
3.7	**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	18	37	19	105.56	10	16	6	60.00	NA		
4.1.2	No. of members	180	396	216	120.00	100	155	55	55.00			
4.1.3	Formation of UG	8	45	37	462.50	3	5	2	66.67			
4.1.4	No. of members	80	265	185	231.25	30	45	15	50.00			
5	**Economic Aspect**											
5.1	**Average Annual Income (Rs)**											
5.1.1	Agriculture and Livestock	54690	66968	12278	22.45	53870	60598	6728	12.49	NA		
5.1.2	Wage employment	44770	54597	9827	21.95	43560	49136	5576	12.80			
5.1.3	Migration	70220	81357	11137	15.86	69650	77785	8135	11.68			
5.1.4	Small enterprises	164000	180597	16597	10.12	170000	185028	15028	8.84			
5.1.5	Service	175500	196630	21130	12.04	170500	184038	13538	7.94			
5.2	**Average Annual Expenditure (Rs):**											
5.2.1	Food	25000	26345	1345	5.38	24200	25011	811	3.35	NA		
5.2.2	Cloths	12200	13153	953	7.81	11500	12133	633	5.50			
5.2.3	Education	5600	7058	1458	26.04	5400	6234	834	15.45			
5.2.4	Health	1700	1602	-98	-5.76	1800	1691	-109	-6.07			
5.2.5	Agriculture	18000	19379	1379	7.66	19000	20005	1005	5.29			

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
5.2.6	Household Assets	1700	1945	245	14.42	1650	1957	307	18.61			
5.2.7	Live-stock	19200	21262	2062	10.74	18600	20255	1655	8.90			
5.2.8	Conveyance	2200	2547	347	15.76	2100	2463	363	17.30			
5.2.9	Others	2200	2431	231	10.48	2000	2149	149	7.45			
6	**Migration: (% HH)**									NA		
6.1	**Employment Opportunities (%):**											
6.1.1	Agriculture and Livestock	72.62	80.15	NA	7.53	73.14	76.32	NA	3.18			
6.1.2	Wage employment	45.78	52.12	NA	6.34	46.88	48.90	NA	2.02			
6.1.3	Migration	7.82	5.15	NA	-2.67	7.14	7.92	NA	0.78	NA		
6.1.4	Small enterprises	1.14	1.45	NA	0.31	2.09	2.70	NA	0.61			
6.1.5	Service	0.98	1.13	NA	0.15	1.14	1.16	NA	0.02			
7	**Outcome of important indicators**											
7.1	Employment in Agriculture related activities among beneficiaries	72.62	80.15	NA	7.53	73.14	76.32	NA	3.18			
7.2	Employment in Non- Agriculture Sector	45.78	52.12	NA	6.34	46.88	48.9	NA	2.02			
7.3	Fuel wood Production	1.54	1.95	0.41	26.62	1.35	1.48	0.13	9.63	NA		
7.4	No. of Milch Cattle	2249	2912	663.0052	29.48	2267	2615	347.9845	15.35			
7.5	Milk Production of Milch Cattle	6.25	8.25	2	32.00	5.25	6.75	1.5	28.57			
7.6	Duration of flow of water in the streams	3	6	3		3	4	1				

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		Project Area 4591Ha.				Control Area 4377Ha.				Project Area 1262.96 Ha.		
		Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change (Unit)	Change (%)	Pre	Post	Change
7.7	No. of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship	12	19	7	58.33	9	14	5	55.56			
7.8	Reduction in migration from rural to urban area in the project area	7.82	5.15	NA	-2.67	7.14	7.92	NA	0.78			
7.9	Annual Mean Household Income	54690	66968	12277.91	22.45	53870	60598	6728.363	12.49			
7.10	No. of children enrolled in schools in the project area.	93.75	100	6.25	6.67	94.5	100	5.5	5.82			

CHAPTER –1

Introduction - Basic information about the Project Area

1.1Location:

IWMP Dungarpur -IV Project is located in Sagwara Block. ofDungarpur District. The Project area is between the latitudes 23°25'' N to 23°35'' N & longitudes.73°55'' E to 74°00'' E It is at a distance of 20 Km from its Block head quarters and 35 Kms from the district head quarters. There are .18 no. of habitations in theproject area and other details are given below.

1.2 Basic details of the Project:

Sagwara the Dungarpur IWMP-IV (2010-11)Project is in Sagwara Block of Dungarpur district. The project area is located between the 73°55' to 74°00' North / 23°25' to 23°35'East. The distance of the watershed area from Panchayat Samiti, Sagwara head quarter is 20 Km while from the district headquarters, it is 35 Km. There are 18 Villages (Habitations) covering 8 Gram Panchayats in the Project area.

Basic details of the Project:

Table: 1.1

Name of Watershed	Sagwara
Project ID : Dungarpur IWMP IV/2010 - 2011	**IWMP-IV**
Panchayat Samiti	**Sagwara**
District	**Dungarpur**
Name of PIA	**A. En., WD&SC, P.S. Sagwara, District -Dungarpur**
Number of Gram Panchayats	**8**
Number of Villages	**18**
Location	**73°55' to 74°00' North / 23°25' to 23°35'East**
Agro-Climatic Zone	**III-A**
Year of Sanction and Start	**2010-11**
Year of Project Completion	**2017**
Project Area	**4591 Ha**
Project Cost (Rs. In Lacs)	**Rs. 550.92Lacs**
Major Stream	**Moran River**
Slope range (%)	**5-9%**
Name of MEL&D Agency	**ArpanSevaSansthan, Udaipur**
Actual expenditure (Rs. in Lacs)	**Rs. 382.79Lacs**

Source: DPR & data received from PIA

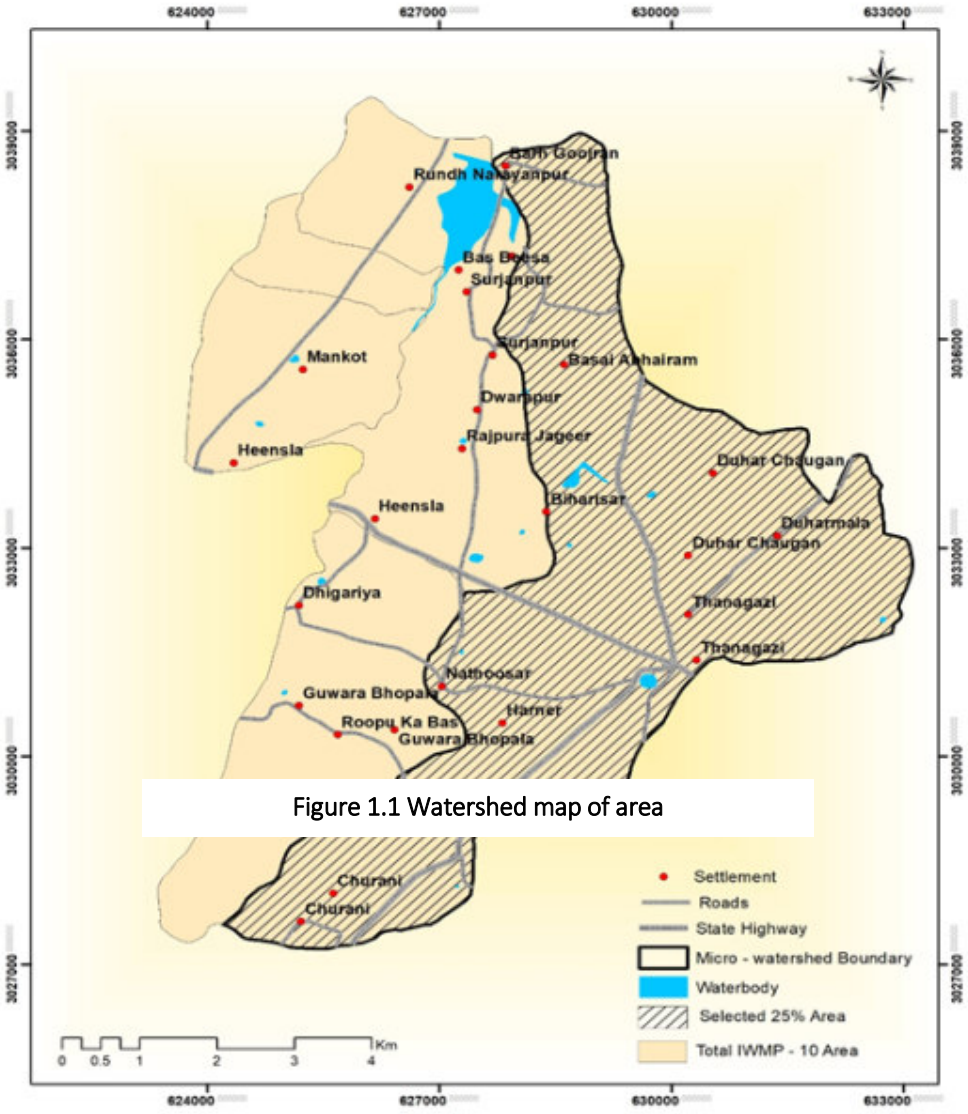


Figure 1.1 Watershed map of area

1.3 Comparison of General details of the project:

1.3.1IWMP Watershed and Control Area details of IWMP–IV/2010-11:

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 **18 villages** were covered in **8 Gram Panchayats** with **4591 hectare** watershed project area, **4590** total number of households and **918**household in surveyed area **(20%).** In Control area as like baseline values, **12** villages were covered in **3** Gram Panchayats with **4377** hectare control area, **3109** total number of households and **622** household in surveyed area **(20%)** during end line.

Details of Selected IWMP Watershed and Control Area of IWMP–IV/2010-11 watershed of Panchayat SamitiSagwara, District Dungarpur:

Table: 1.2

Timeline	Project Area of Water-shed	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 IWMP water-sheds	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	4591	BaliyaBadgama, Obri, Piplagunj, Barbodniya, Virat, Kahela, Mandav, GhataKa Gaon,	Biliya, Badgama, Obri, Favta, Piplagunj, Barbodniya, Chani, Virat, Jakhda, Matuvate, Nalwara, Benn, Bhairavpura, Pratappura, Panchwal, Kantri, GhataKaGaon, Jadela	Varda, Ranoli ,Tamtiya,	Dhaniupli,Dhani Nichli,Varda,Malvi,Padampura,Ranoli,Nogama,Mowai,Bhoolawara,Bhachariya,Tamtiya, Beejawara,	4377	4590	918	3109	622
Endline	4591	BaliyaBadgama, Obri, Piplagunj, Barbodniya, Virat, Kahela, Mandav, GhataKa Gaon,	Biliya, Badgama, Obri, Favta, Piplagunj, Barbodniya, Chani, Virat, Jakhda, Matuvate, Nalwara, Benn, Bhairavpura, Pratappura, Panchwal, Kantri, GhataKaGaon, Jadela	Varda, Ranoli ,Tamtiya,	Dhaniupli,Dhani Nichli,Varda,Malvi,Padampura,Ranoli,Nogama,Mowai,Bhoolawara,Bhachariya,Tamtiya, Beejawara,	4377	4590	918	3109	622

Source: DPR, Census data& data received from PIA

1.3.2 Fund Utilization in Dungarpur, IWMP-IV/2010-11 project:

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

Fund Utilization in Dungarpur, IWMP-IV/2010-11 project

Table: 1.3

S. No.	Name of Head/ Component	Total Financial Target / Provisions As per DPR (Rs in Lacs)	Expenditure against at PIA level (Rs in Lacs)	Percentage Utilization (%) (Col. 7/3)
1	2	3	5	6
1	Administration	55.09	35.19	63.87
2	Monitoring	5.51	3.70	67.16
3	Evaluation	5.51	0.00	0.00
4	EPA	22.04	21.00	95.30
5	I.&C.B.	27.55	18.66	67.74
6	D.P.R.	5.51	3.98	72.24
7	N.R.M. Works	308.52	271.07	87.86
8	Livelihood	49.58	4.75	9.58
9	Production & Micro Enterprise	55.09	24.44	44.36
10	Consolidation & Flaxy	16.53	0.00	0.00
	Grand Total	**550.92**	**382.79**	**69.48**

Source: Data received from PIA

The above progress reveals that **69.48%** of funds have utilized at the Final Impact evaluation stage, which is **Good**progress level. Under EPA head, the progress is **above 90%,** which is**Excellent**.

Details of PIA level Account as per data provided by PIA – Dungarpur IWMP-IV (2010-11):

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.	61115941401 SBI	42.00	42.00	42.00

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. **Hand Pump** were executed/constructed.

2.2 Proposal in DPR for EPA Work:

EPA works are a part of approved DPR, which are duly approve 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.	Proposal as per DPR	No	Financial provisions in Rs.Laces
1	Hand pump installation	52	22.04
	Total	**52**	22.04

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 ArpanSevaSansthan 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	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
1	HandpumpNirmaan	23.59436	73.89896	Padliya	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	42
2	HandpumpNirmaan	23.59538	73.90001	Padliya	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
3	HandpumpNirmaan	23.59486	73.90218	Padliya	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
4	HandpumpNirmaan	23.57514	73.90475	Jadela	GhataKaGav	2011-12	0.45	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	45

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
5	HandpumpNirmaan	23.57201	73.89805	Jadela	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
6	HandpumpNirmaan	23.58798	73.91125	GhataKaGav	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
7	HandpumpNirmaan	23.58988	73.91587	GhataKaGav	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
8	HandpumpNirmaan	23.70153	73.91017	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	55
9	HandpumpNirmaan	23.70198	73.90083	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	44

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
10	HandpumpNirmaan	23.6983	73.8989	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
11	HandpumpNirmaan	23.69755	73.90277	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	65
12	HandpumpNirmaan	23.69338	73.90326	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
13	HandpumpNirmaan	23.69707	73.89935	Chani	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	80
14	HandpumpNirmaan	23.6812	73.90954	Barbodniya	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
15	HandpumpNirmaan	23.68609	73.91106	Barbodniya	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
16	HandpumpNirmaan	23.68327	73.91241	Barbodniya	Barbodniya	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	45
17	HandpumpNirmaan	23.67736	73.91155	Matuvet	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	53
18	HandpumpNirmaan	23.67882	73.91225	Matuvet	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	49
19	HandpumpNirmaan	23.66647	73.90521	Lodeshwar	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	52

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
20	HandpumpNirmaan	23.66496	73.91121	Lodeshwar	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
21	HandpumpNirmaan	23.70807	73.9158	Jakhda	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	45
22	HandpumpNirmaan	23.70125	73.91013	Jakhda	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
23	HandpumpNirmaan	23.71107	73.91225	Jakhda	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	55
24	HandpumpNirmaan	23.71465	73.91082	Jakhda	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	45

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
25	HandpumpNirmaan	23.69706	73.87332	Biliya	BiliyaBadgama	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	44
26	HandpumpNirmaan	23.69741	73.86968	Biliya	BiliyaBadgama	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
27	HandpumpNirmaan	23.78579	73.89965	Ben	Kahela	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
28	HandpumpNirmaan	23.78512	73.89654	Ben	Kahela	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
29	HandpumpNirmaan	23.78183	73.89514	Ben	Kahela	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
30	HandpumpNirmaan	23.77642	73.89151	Naalwara	Kahela	2011-12	0.45	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	50
31	HandpumpNirmaan	23.78004	73.90312	Bhairavpura	Kahela	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	55
32	HandpumpNirmaan	23.78106	73.90923	Pratappura	Kahela	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	45
33	HandpumpNirmaan	23.78387	73.90465	Panchaval	Mandav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	68
34	HandpumpNirmaan	23.63962	73.88631	Tobri	Tobri	2011-12	0.45	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
35	HandpumpNirmaan	23.63669	73.88256	Tobri	Tobri	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
36	HandpumpNirmaan	23.6375	73.88156	Tobri	Tobri	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
37	HandpumpNirmaan	23.6394	73.87836	Tobri	Tobri	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
38	HandpumpNirmaan	23.64827	73.86726	Favta	Peeplagunj	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
39	HandpumpNirmaan	23.64827	73.86726	Favta	Peeplagunj	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	85

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			9	10	11
40	HandpumpNirmaan	23.65081	73.90235	Peeplagunj	Peeplagunj	2011-12	0.45	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	48
41	HandpumpNirmaan	23.65772	73.90476	Peeplagunj	Peeplagunj	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	60
42	HandpumpNirmaan	23.66595	73.90854	Lodeshwar	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	62
43	HandpumpNirmaan	23.67146	73.89843	Virat	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	74
44	HandpumpNirmaan	23.66808	73.90368	Lodeshwar	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70

S. No.	Name of Activity	Location		Place		Year of execution	Sanction Cost	Fund Utilized (in Rs.)	Status of utilization of activity		Benefitted Family (Nos.)
		Lat.	Long.	Village	GP		(in Rs.)		Expected	Actual	
1	2	3		4	5	6			9	10	11
45	HandpumpNirmaan	23.71285	73.9112	Jakhda	Virat	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	68
46	HandpumpNirmaan	23.65525	73.90179	Tobri	Tobri	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	72
47	HandpumpNirmaan	23.70122	73.87332	Biliya	BiliyaBadgama	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	65
48	HandpumpNirmaan	23.59664	73.90984	GhataKaGav	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	70
49	HandpumpNirmaan	23.56958	73.89562	Jadela	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	56

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			9	10	11
50	HandpumpNirmaan	23.57211	73.90214	Jadela	GhataKaGav	2011-12	0.44	0.42	Drinking Water use for human & live stock in village	useful for human &live stock Drinking water in village	58
	Total						**22.04**	**21.00**			**2946**

Source: Data received from PIA

Accordingly, a provision of **Rs. 22.04 lacs** was kept in the DPR for EPA works in this project and at the Final evaluation stage of the project **Rs. 21.00 Lacs** were utilized under EPA, which is **95.30%** financial achievement.

2.4 Utility:

In all, total **50 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 Utilized (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.	Handpump	50	22.04	21.00	2935	0	50
	TOTAL	50	22.04	21.00	2935	0	50

Source: Survey results of MEL&D agency Arpan

As most of the EPA works being executed in the watershed area, were not executed by any other government schemes along with the demand of the local community is very well recognized during the planning of DPR. It is also 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 and the human and livestock are being benefitted.

The important area to look into is the regular operation and maintenance of asset created like Handpump and supply / feeding of water to the resource created by the villagers themselves. Repair and maintenance of executed work will be needed in due course of time to keep them useful sustainably.

2.5 Impact of Intervention:

As far as purpose or objective of these EPA is concern, it already described above that both the EPA activities were targeted for providing drinking water access to the human and for livestock. Drinking water for human beings and cattle was very crucial before the IWMP Project but after Construction of Handpump at the selected places, availability of drinking water for human, cattle and other house hold necessity has ensured. Earlier, women were fetching water from the long distance in the project area to fulfill the requirement but now the resources has the availability of water nearby their houses, so that the time is being saved and they are able to utilize the saved time in other productive works.

It is reported that by and large the quality of all**50 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.)	Status of utilization of activity (Nos.)	
				Useful for Human / Livestock Drinking water& Lighting in village	Water Not available & Not Working at time
1	**2**	**3**	**4**	**5**	**6**
1.	Hand pumpNirmaan	50	2935	50	0
	TOTAL	**50**	**2935**	**50**	**0**

Source: Survey results of MEL&D agency Arpan

Above table reveals that most of the EPA works are not fulfilling the desired benefits as most of the works are not in working condition at time due to lack of maintenance. Out of 50 hand pumps, all 50handpumps are benefitting the community as it has water available at time. For proper maintenance of such work, it was recommended in Concurrent Process Monitoring that such assets could be handed over to the Gram Panchayat and makes sure the O&M of such assets.

Further, with an investment of **Rs. 21.00lacs** incurred in **50 Hand Pumps asset**installation inEPA work, **2935** families are being benefitted.

2.6 Photo Gallery:

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

Handpump nirmaan

Handpump nirmaan

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:S**ocial 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, activitiesetc. 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 **7 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, **73 Nara Lekhan Wall Painting activities** was carried out in all 11 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. 0.39/-** was utilized benefitting all the families of the project area directly or in-directly.

Details of IEC activities at all 20 villages of 7 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
	Nara Lekhan Wall Painting,	Nara Lekhan Wall Painting (73) Cultural	0.39Lacs	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 panchayatsamiti, 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 arecarried 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 Outstate Exposure tour was conducted by the PIA. In this activity, total **50 beneficiaries** belonging to **50 families** were participated/benefitted. Out of 50 participants, **39 were male and 11 were female**. A sum of **Rs. 1.36Lacs** 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) Dungarpur, PIA, Sagwara, 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.

3.3Training 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	Training of SHGs	9	60	300	0.90	360
2	WC/ Gram Panchayat personnel training	5	100	7	1.85	107
3	Skill Development Training	12	155	80	9.55	235
4	Training of UGs	8	260	40	1.3	300
5	Training of Farm Production measures	9	300	70	1.8	370
6	Training of Animal Husbandry	14	310	420	1.51	730
	Total for Training	**57**	**1185**	**917**	**16.91**	**2102**
7	Outstate Exposure tour conducted & Places	1	39	11	1.36	50
	Total	**58**	**1224**	**928**	**18.27**	**2152**

Source: Data received from PIA

In this watershed, total**58**different trainings and exposure visit activities were organized; out of which **95**were different types of trainings and **1**was exposure visit outside the State. Total **2152 persons** were benefitted in the training and exposure visit activity; of which **2102** were under training activity and **50**under exposure visit activity.

Further, total **1224 male** person were benefitted; of which **1185** were under training and **39** were under exposure visit and total **928** female members were benefitted; of which **917** were under training and **11** under exposure visit activity.

3.4 Financial Achievements:

As per DPR, a provision of **Rs. 27.55Lacs** was kept under **Institution and Capacity Building Activity head** of the project against the total provision of **Rs. 550.92 lakh**. Out of which a sum of **Rs.18.66Lacs** was utilized during the project period, which is**67.74%** of approved provisions.

The expenditure of **Rs. 18.66Lacs**comprises of **Rs. 16.91Lacs** on Training activities, **Rs. 1.36 Lacs**on exposure visit and **Rs. 0.39 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 Dungarpur IWMP- IV 2010-11.

4.2People'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.

4.3Institutional Arrangements under IWMP:

The institutional arrangements for the project execution at community level followed in the District DUNGARPUR, Panchayat Sagwara 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 IWMP DUNGARPUR IWMP -4-2010-11:

In case of **Dungarpur IWMP -4/2010-11Sagwara** watershed project, the details are as under:

WCDC and PIA in Dungarpur IWMP -4-20010-11

Table: 4.1

Name of Project Manager, Watershed Cell cum Data Centre (PM WCDC)	**Sh. Ganesh LalRoat (S.E.)**
Name of Project Implementing Agency (PIA) and supporting technical staff	ShriD.K. Jain (XEN) ShriD.K. Jain(AEN) Shri…Yogesh Joshi &JagmalsinghArya.. (JEN)

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

4.3.2 Watershed Development Team in Dungarpur IWMP -4-2010-11: Watershed Development Team in Dungarpur IWMP -4-2010-11

Table: 4.2

Name of Watershed Development Team (last Position)	Name of WDT
Engineering expert	Rajesh Patidar
Agriculture expert	PiyushChoubisa
Veterinary expert	DayalalRoat
Social science expert	PayalBhagat

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

4.3.3Self 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 19 **SHGs** were formed in this cluster with**216 members**.

Details of Self Help Groups in Dungarpur IWMP- IV 2010-11:

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**
Piplagunj	3	34	34	34
Virat	2	25	25	25
Orbri	3	32	32	32
Nalwara (kahela)	6	63	63	63
Barbudniya	3	39	39	39
Ghatakagaon	2	23	23	23
Total	**19**	**216**	**216**	**216**

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

4.3.5User 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**37 UGs** were formed in this cluster with **185 members**.

4.3.5.1 Details of User Groups in Dungarpur IWMP- IV 2010-11:

Table: 4.4

Name of GP	Total No. of UG formed	Total No. of UG members	No. of SC/ST members
1	**2**	**3**	**4**
GhatakaGaon	4	20	17
Barbudniya	6	30	26
Nalwara (kahela)	5	25	23
Biliyabadgama	4	20	18
Virat	5	25	22
Obri	7	35	31

Name of GP	Total No. of UG formed	Total No. of UG members	No. of SC/ST members
Piplagunj	6	30	28
TOTAL	**37**	**185**	**165**

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

4.3.6Watershed Committee (WC):

Total **7 WCs** were formed in this cluster with **109 members**.

4.3.6.1 Details of Watershed Committee (WC) in Dungarpur IWMP -4/2010-11:

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	GhataKa Gaon	NirmlaHadat	Jaggannath	9	7	3	16.8.2011	BRGB SAGWARA 42590100006667
2	Barbodaniya	KailashRoat	Hemendra Kumar	9	9	4	18.9.2010	BRGB SAGWARA 42590100006663
3	Nalwada	Bhai Shankar Roat	Suresh Parmar	9	9	3	17.8.2011	BRGB SAGWARA 42590100007161
4	Biliya	Gavri Devi	VimalPrakash	9	9	4	17.9.2011	BRGB SAGWARA 42590100006666
5	Virat	BhanJi	Rameshwar	10	10	3	20.8.2010	BRGB SAGWARA 42590100006664
6	Obri	Bheela Devi	Pahad Singh	10	10	4	17-08-2011	BRGB SAGWARA 42590100006665
7	Piplagung	Harihar Parma	RatanLal	10	10	3	18-08-2011	BRGB SAGWARA 42590100006669
	Total			**66**	**64**	**24**		

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 Dungarpur IWMP -4/2010-11watersheds 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

5.1Soil 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.	145	26.54	-	-	-	-
	(b) Pasture Development*	Ha.	-	-	3	1.66	-	-
(ii)	**Soil and Moisture Conservation**							
	(a)Field Bunds	Meter	1008	140.86	1008	119.51	100	84.84
(iii)	**Vegetative & Engineering Structure**							
	(a) Earthen Bund	Nos.	-	-	6	4.16	-	-
	(b) CCT & DCCT	Nos.	-	-	660	1.98	-	-
	(c) SGT	Nos.	8	6.4	907	4.99	11337	77.97
(iv)	**Water Harvesting Structure (New created)**							
	(a) Earthen Check Dam	Nos.	196	27.51	27	35.78	13.78	130.06
	(b) MPT	Nos.	-	-	98	50.81	-	-
	(c) Others (Talai& WHS) PakkaChek dam	Nos.	61	91.47	14	56.34	22.95	61.59
	Total			**308.52**		**271.07**		**87.86**

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 DUNGARPUR IWMP-4			
S.No.	**Particulars**	**Sanction Amount**	**Financial Expenditure (in lacs)**
A	**Forest Department**		
	Conservation		
B	**Rural Development**	NIL	NIL
	Grand Total	NIL	NIL

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. **271.07**lacs (**87.86**%) are more than planned as per DPR. Apart from such expenditure incurred in soil and water conservation measures through IWMP, about Rs**. 0.0**lacs more incurred through convergence of different government department in Dungarpur IWMP_4. As result of it, the financial achievement of **87.86%** against the targeted amount is in actually achieved more than **0.00 % through convergence**.

5.2 Impact of interventions:

It is observed that major expenditure in Dungarpur IWMP -4/2010-11watersheds is done on field bunds on farmers' fields, Anicuts, CCT, DCCT, MPT, SGT Earthen Check Dams and PakkaChekdam. Field bund**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**			
1.	CCT & DCCT	Nos.	660	2.23	15
2.	MPT	Nos.	98	440	294
3.	SGT	Nos.	907	4.25	43
4.	Earthen Check Dams	Nos.	27	20.52	27
5.	Others (Talai& WHS) PakkaChekdam	Nos.	14	84	280
	Total		**1706**	**551**	**659**

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 **551 Thousands CUM.** With the implementation of watershed activities, total **659**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 Sagwara, Dungarpur 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 DungarpurIWMP-4 (2010-11) 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	Nos.	-	-	700	**5.90**	-	-
2	Dry Land Horticulture	Nos.	-	-	6300	**4.01**	-	-
3	Kitchen Garden Kit	Nos.	-	-	1057	**9.91**	-	-
4	Fodder Demonstration	Nos.	-	-	819	**4.18**	-	-
5	Vermi compost	Nos.	-	-	7	**0.44**	-	-
	Total			**55.09**	**8883**	**24.44**		**44.36**

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

STATUS OF COMPLETED AGRICULTURE & HORTICULTURE DEVELOPMENT ACTIVITIES THROUGH CONVERGENCE IN DUNGARPUR IWMP-4			
S.No.	**Particulars**	**Sanction Amt.**	**Financial Expenditure (in lacs)**
A	**Agriculture Department**	**NIL**	
	Micro Irrigation System	**NIL**	**NIL**
B	**Horticulture**	**NIL**	**NIL**
	Production Activity	**NIL**	**NIL**
	Grand Total		

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

As against the total project cost of IWMP Dungarpur -IV/2010-11 watershed, of **Rs. 55.09 Lacs**, provision for Production System and Micro-enterprises component (Agriculture & Horticulture Development)was kept as **Rs. 24.44Lacs**. During the project period total expenditure on Production System and Micro-enterprises component activities was reported **Rs24.44Lacs**, which is **44.36%**against the targeted amount. While considering the funds being utilized through convergence is Rs.**0.00**lacs in IWMP -4 and as a result of it total Rs. **0.00**lacs has been incurred in IWMP 4.

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	Production	569	8129	185	0	8883	0.00	0.00	0.00	0.00	0.00	24.44
	Total	**569**	**8129**	**185**	**0**	**8883**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**24.44**

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

Total benefitted beneficiaries under **Production System and Micro-enterprises component** were 8883 Nos. Out of which **819** were benefitted under Kitchen garden kit and remaining **6300** under Dry Land Horticulture activity, **700** under Crop Demonstration, **7** under Vermin Composting and **819** Fodder Demonstration.

The beneficiaries have contributed a sum of **Rs. 0.00Lacs** 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 Dungarpur IWMP-4 (2010-11) 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–4/2010-11	Base line	1194	824	80	568	785	80	370	904	80
	End line	1950	1275	95	986	1270	95	675	1370	95
	Impact / change (ha)	**756**	**451**	**15**	**418**	**485**	**15**	**305**	**466**	**15**
	Impact / % change	**63.36**	**54.80**	**18.75**	**73.59**	**61.78**	**18.75**	**82.42**	**51.61**	**18.75**
Control area	Base line	1253	865	84	596	825	84	388	949	84
	End line	1320	905	88	630	867	88	415	993	88
	Impact / change (ha)	**67**	**40**	**4**	**34**	**42**	**4**	**27**	**44**	**4**

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
	Impact / % change	**5.35**	**4.62**	**4.76**	**5.70**	**5.09**	**4.76**	**6.96**	**4.64**	**4.76**

Source: Survey results of MEL&D agency Arpan

It is observed during the end line survey that**63.36**% Kharif, **54.80**% Rabi and **18.75**% Jayadcultivation area is increased in watershed area as compared to **5.35**% Kharif, **4.62**% Rabi and **7.76**% Jayad in Control area. The Single crop area is increased in watershed and control area respectively**82.42** %and **6.96**%, increase in Double and multiple crop area is**51.61**% and **18.75**% respectively in watershed area as compared to **4.64**% and **4.76**% 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		
		Maize	Others	Total	Mustard	Wheat	Others	Total	Total	Kharif	Rabi	Zaid
1	2	3	4	5	6	7	8	9	10	11	12	13
IWMP – 4/2010 -11	Base line	811	383	1194	452	201	171	824	80	47.58	95.31	100.00
	End line	1370	580	1950	682	325	268	1275	95	50.56	99.61	100.00
	Impact / change (ha)	**559**	**197**	**756**	**230**	**124**	**97**	**451**	**15**	**2.98**	**4.30**	**0.00**
	Impact / % change	**68.9**	**51.6**	**63.4**	**50.9**	**61.7**	**57.1**	**54.8**	**18.8**	**2.98**	**4.30**	**0.00**
Control area	Base line	835	418	1253	462	223	180	865	84	47.57	95.38	100.00
	End line	875	445	1320	478	237	190	905	88	47.73	95.80	100.00
	Impact / change (ha)	**40**	**27**	**67**	**16**	**14**	**10**	**40**	**4**	**0.16**	**0.43**	**0.00**
	Impact / % change	**4.8**	**6.5**	**5.3**	**3.5**	**6.3**	**5.6**	**4.6**	**4.8**	**0.16**	**0.43**	**0.00**

Source: Survey results of MEL&D agency Arpan

It is observed that cropped area in Maize is increased by **68.9**%, Mustard by **50.9**% and Wheat by **61.7**% in watershed area as compared to **4.8**% in Maize, **3.5**% in Mustard &**6.3**% in Wheat in control area. Likewise % irrigated area to total cultivation area is also increased by **2.98**% in Kharif and**4.30**% in Rabi in watershed area as compare to control area where Kharif increased by **0.16**% and Rabi decreased by **0.43**%.

6.2.3Average 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	Timeline	Season	Crop Type	Average Crop productivity Per Ha. (Kg.)	Use of Organic manures (%)	
					Compost	Vermi Compost
IWMP Dungarpur_4 2010/11	Base line	Kharif	Maize	1.35	95.00	26.00
			Paddy	3.35	97.00	22.00
			Black Gram	0.85	91.00	20.00
		Rabi	Wheat	3.55	94.00	28.00
			Gram	1.03	92.00	25.00
		Jayad	Moong	1.01	87.00	21.00
	EndLine	Kharif	Maize	1.65	97.50	28.50
			Paddy	3.58	97.50	22.00
			Black Gram	1.12	94.50	23.00
		Rabi	Wheat	3.86	97.00	31.00
			Gram	1.23	96.00	28.50
		Jayad	Moong	1.29	92.00	25.00
	Impact change	Kharif	Maize	**0.30**	**2.50**	**2.50**
			Paddy	**0.23**	**0.50**	**0.00**
			Black Gram	**0.27**	**3.50**	**3.00**
		Rabi	Wheat	**0.31**	**3.00**	**3.00**
			Gram	**0.20**	**4.00**	**3.50**
		Jayad	Moong	**0.28**	**5.00**	**4.00**
Control Area	Base line	Kharif	Maize	1.34	94.00	24.00
			Paddy	3.33	96.00	20.00
			Black Gram	0.84	90.00	18.00
		Rabi	Wheat	3.52	93.00	25.00
			Gram	1.01	91.00	21.00
		Jayad	Moong	0.98	85.00	18.00
	EndLine	Kharif	Maize	1.49	95.75	25.50
			Paddy	3.45	97.00	20.25
			Black Gram	1.02	92.00	20.00
		Rabi	Wheat	3.72	95.00	27.50
			Gram	1.18	94.00	24.00
		Jayad	Moong	1.12	89.00	22.00
	Impact (A)% change	Kharif	Maize	**0.15**	**1.75**	**1.50**
			Paddy	**0.12**	**1.00**	**0.25**
			Black Gram	**0.18**	**2.00**	**2.00**
		Rabi	Wheat	**0.20**	**2.00**	**2.50**
			Gram	**0.17**	**3.00**	**3.00**
		Jayad	Moong	**0.14**	**4.00**	**4.00**

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, Gwaretc 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 income of farmers has 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 **19 SHGs (19 SHGs and 0 Individual beneficiary)** were benefitted with total amount of **Rs. 4.75 Lac**.

7.2 Adopted Livelihood activities:

Livelihood Support System: The total cost of Project is **Rs. 550.92Lacs**. The financial provision for the Livelihood Support System was kept as **Rs49.58Lacs.** Out of that, at the Final evaluation stage, a sum of **Rs. 4.75Lacs**has been utilized as reported by the PIA, which is **9.58%** of **Rs49.58Lacs** total sanctioned amount. Out of Rs. **4.75Lacs,Rs. 4.75Lacs**is utilized by providing revolving fund to **10 SHGs** and **Rs. 0.0Lacs** has been utilized to benefit **0 individualbeneficiaries** 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	Shree Laxmi	Piplagunj	11	25000	Y
2	Milan	Piplagunj	12	25000	Y
3	Shree Durga	Piplagunj	11	25000	Y
4	Krishna	Virat	13	25000	Y
5	Laxmi	Virat	12	25000	Y
6	Ramdevji	Obri	10	25000	Y
7	Jay Santoshi	Obri	10	25000	Y
8	Shiv Sakti	Obri	12	25000	Y
9	Santoshi Mata	Nalwara	10	25000	Y
10	Bajrangbali	Nalwara	11	25000	Y
11	Bal Hanuman	Nalwara	10	25000	Y
12	Priyanka	Nalwara	10	25000	Y
13	Saraswati	Nalwara	10	25000	Y
14	Anjana	Nalwara	12	25000	Y
15	Bhuri	Barbudniya	13	25000	Y
16	Shree Ram	Barbudniya	13	25000	Y
17	Ganima	Barbudniya	12	25000	Y
18	Nishkalank	GhatakaGaon	11	25000	Y
19	Jay Laxmi	Ghatakagaon	213	25000	Y
		Total		**475000**	

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**		**6**
1	NIL	NIL	NIL	NIL	NIL
Total					

Source: From concerning PIA

7.3 Impact of Intervention:

The revolving fund @ Rs. 25,000/- was provided to the **19 SHGs (19 SHGs and 0 Individual beneficiaries)** for carrying out their own selected income generating activities to support their livelihoods. These activities are grocery shop, stitching, goat rearing, diary etc.

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:

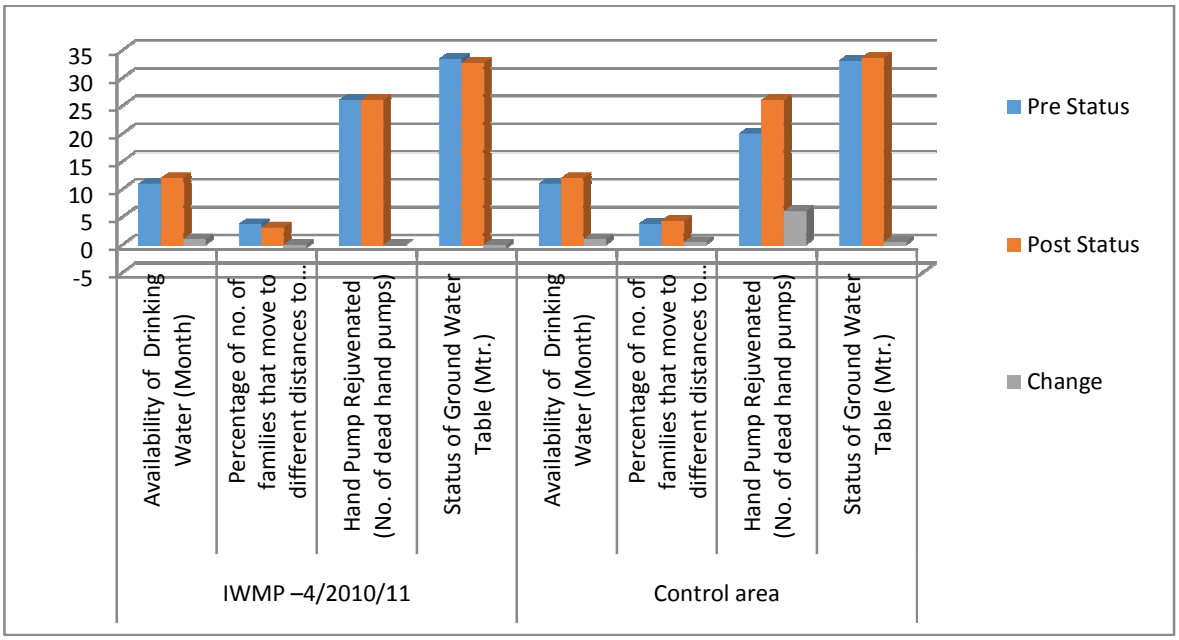
8.1.1 Availability of drinking water for human being and cattle:

Status of Drinking Water:

Table:8.1

S. No.	Area	Indicator	Pre Status	Post Status	Change	Reason
1	2	3	4	5	6	7
1	IWMP–4/2010-11	Availability of Drinking Water (Month)	11	12	**1**	Water conservation, recharge works and new improved technology interventions in Agriculture
2		Percentage of no. of families that move to different distances to fetch water (%)	3.7	3.1	**-0.6**	
3		Hand Pump Rejuvenated (No. of dead hand pumps)	26	26	**0**	
4		Status of Ground Water Table (Mtr.)	33.42	32.75	**-0.67**	
1	Control area	Availability of Drinking Water (Month)	11	12	**1**	
2		Percentage of no. of families that move to different distances to fetch water (%)	3.79	4.26	**0.47**	
3		Hand Pump Rejuvenated (No. of dead hand pumps)	20	26	**6**	
4		Status of Ground Water Table (Mtr.)	33.13	33.62	**0.49**	

Source: Survey results of MEL&D agency Arpan



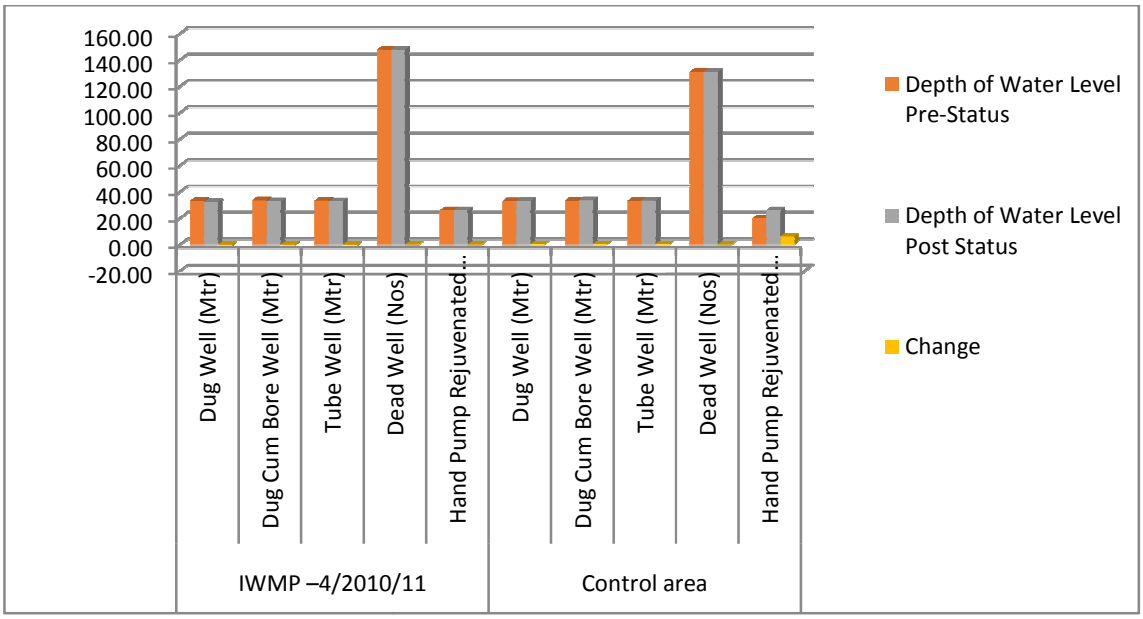
8.1.2 Status of Ground Water Table:

Status of Ground Water Table (Watershed Level)

Table:8.2

S. No.	IWMP/ Control Area	Type (Wells)	Depth of Water Level		Change	Reason
			Pre-Status	Post Status		
1	2	3	4	5	6	7
1	IWMP–4/2010-11	Dug Well (Mtr)	33.15	32.45	**-0.70**	Water conservation, recharge works and new improved technology interventions in Agriculture
2		Dug Cum Bore Well (Mtr)	33.59	32.92	**-0.67**	
3		Tube Well (Mtr)	33.51	32.87	**-0.64**	
4		Dead Well (Nos)	148	148	**0.00**	
5		Hand Pump Rejuvenated (Nos of dead hand pumps)	26	26	**0.00**	
1	Control area	Dug Well (Mtr)	32.96	33.18	**0.22**	
2		Dug Cum Bore Well (Mtr)	33.25	33.62	**0.37**	
3		Tube Well (Mtr)	33.19	33.5	**0.31**	
4		Dead Well (Nos)	131	131	**0.00**	
5		Hand Pump Rejuvenated (Nos of dead hand pumps)	20	26	**6.00**	

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	Earthen Bund	Ha.			6	4.16	0	0	6	4.16
2	CCT & DCCT	Meter	-	-	660	1.98	0	0	660	1.98
3	SGT	Nos.	8	6.4	907	4.99	0	0	907	4.99
4	Earthen Check Dam	Nos.	196	27.51	27	35.78	0	0	27	35.78
5	MPT	Nos.	-	-	98	50.81	0	0	98	50.81
6	Others (Talai& WHS) PakkaChek dam	Nos.	61	91.47	14	56.34	0	0	14	56.34
	Total			**6.4**		**11.13**	**0**	**0**	**1712**	**154.06**

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

In this watershed, **1712** different types of water storage/harvesting structures were created with an investment of **Rs. 154.06Lacs.**

8.2 Land Use/ Land Cover (Agriculture):

8.2.1 Area under Cultivation (Kharif, Rabi and Jaid)

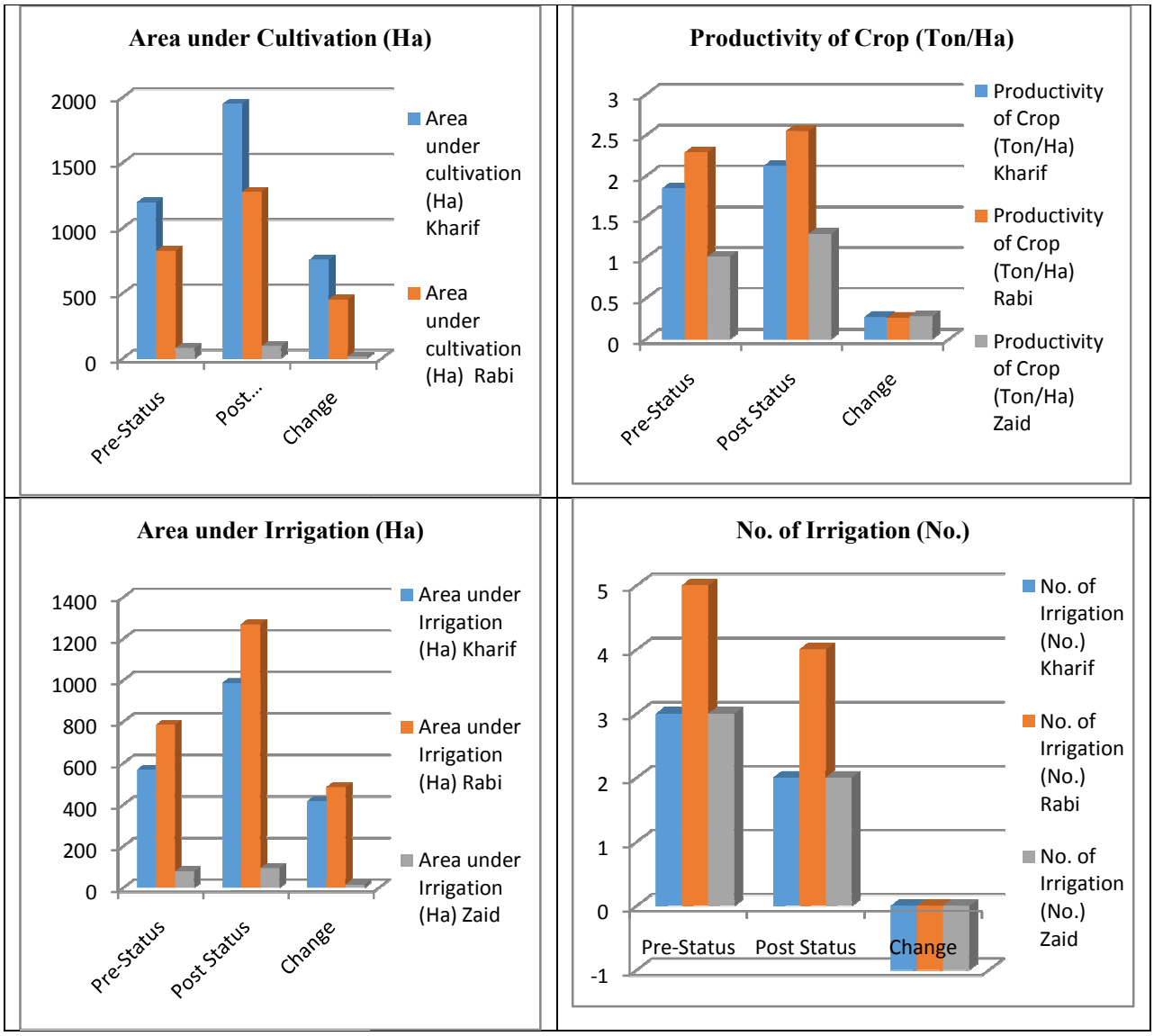
Changes in Agriculture observed during ground-based base line/ end line survey:

Table:8.5

S. No.	Indicators		Pre-Status	Post Status	Change
1	2		3	4	5
IWMP–4 /2010-11	Area under cultivation (Ha)	Kharif	1194	1950	**756**
		Rabi	824	1275	**451**
		Zaid	80	95	**15**
	Productivity of Crop (Ton/Ha)	Kharif	1.85	2.12	**0.27**
		Rabi	2.29	2.55	**0.26**
		Zaid	1.01	1.29	**0.28**
	Area under Irrigation (Ha)	Kharif	568	986	**418**
		Rabi	785	1270	**485**
		Zaid	80	95	**15**
	No. of Irrigation (No.)	Kharif	3	2	**-1**
		Rabi	5	4	**-1**
		Zaid	3	2	**-1**

S. No.	Indicators		Pre-Status	Post Status	Change
1	2		3	4	5
Control Area	Area under cultivation (Ha)	Kharif	1253	1320	**67**
		Rabi	865	905	**40**
		Zaid	84	88	**4**
	Productivity of Crop (Ton/Ha)	Kharif	1.84	1.99	**0.15**
		Rabi	2.27	2.45	**0.18**
		Zaid	0.98	1.12	**0.14**
	Area under Irrigation (Ha)	Kharif	596	630	**34**
		Rabi	825	867	**42**
		Zaid	80	113	**33**
	No. of Irrigation (No.)	Kharif	3	3	**0**
		Rabi	5	5	**0**
		Zaid	3	3	**0**

Source: Survey results of MEL&D agency Arpan



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

Table:8.6

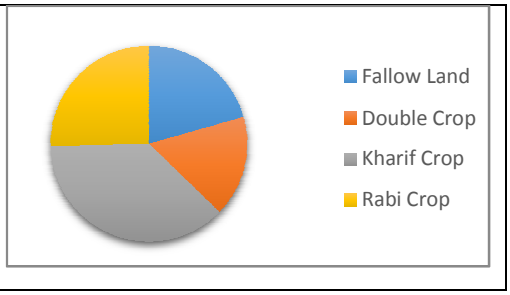
Land use Class	Area Pre (Ha)	Area Post (Ha)	Difference (Ha)
Agriculture	808.256	822.045	13.79

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	249.689	30.568
Double Crop	202.418	24.781
Kharif Crop	452.413	55.386
Rabi Crop	308.572	37.776

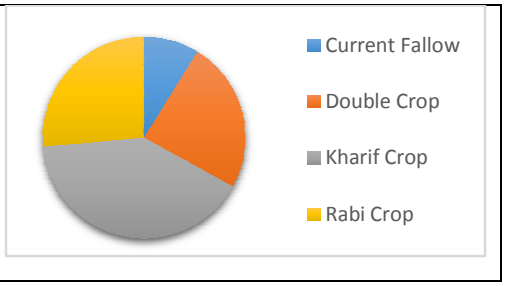


Source: GIS Report by MEL&D agency

(B) Post Classification of Crop Land

Table:8.8

and use Class	Area (Ha)	Area (%)
1	2	3
Current Fallow	140.424	16.755
Double Crop	386.818	46.153
Kharif Crop	646.220	77.104
Rabi Crop	422.220	50.377



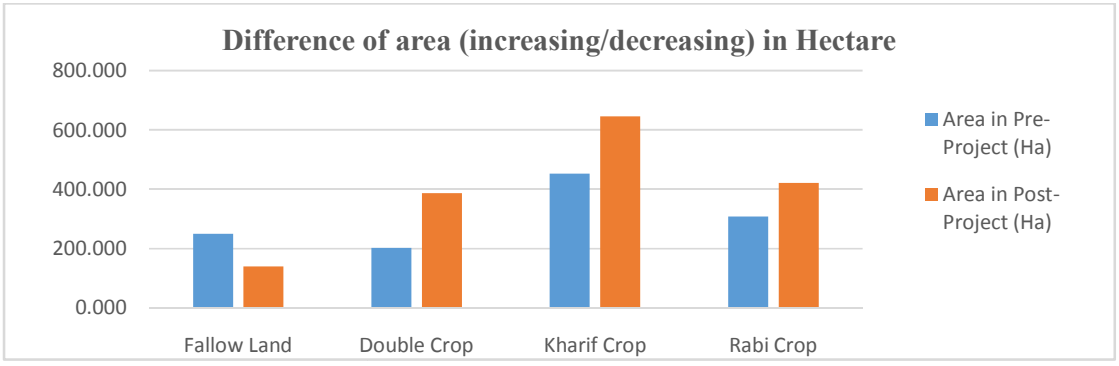
Source: GIS Report by MEL&D agency

Difference of area (increasing /decreasing) in Hectare & Percentage

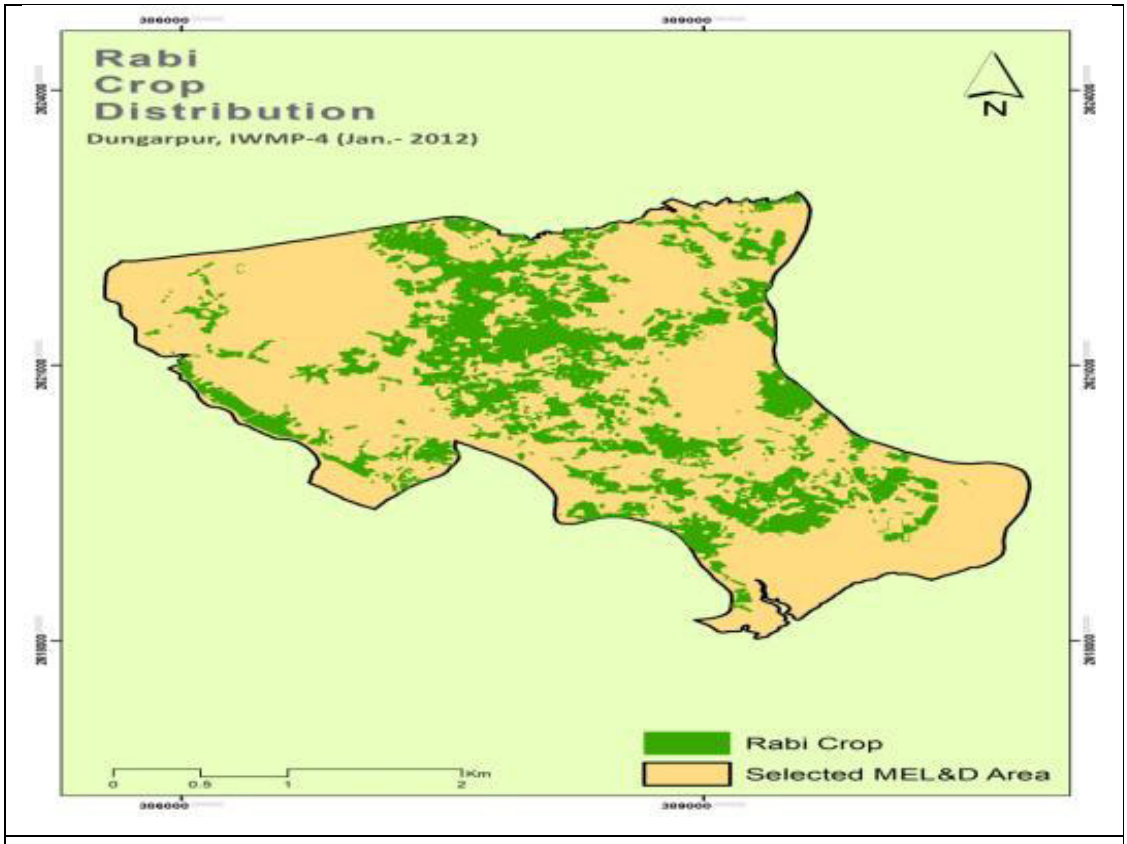
Table:8.9

Landuse Class	Area in Pre-Project (Ha)	Area in Post-Project (Ha)	Difference
Current Fallow	249.689	140.424	-109.27
Double Crop	202.418	386.818	184.40
Kharif Crop	452.413	646.220	193.81
Rabi Crop	308.572	422.220	113.65

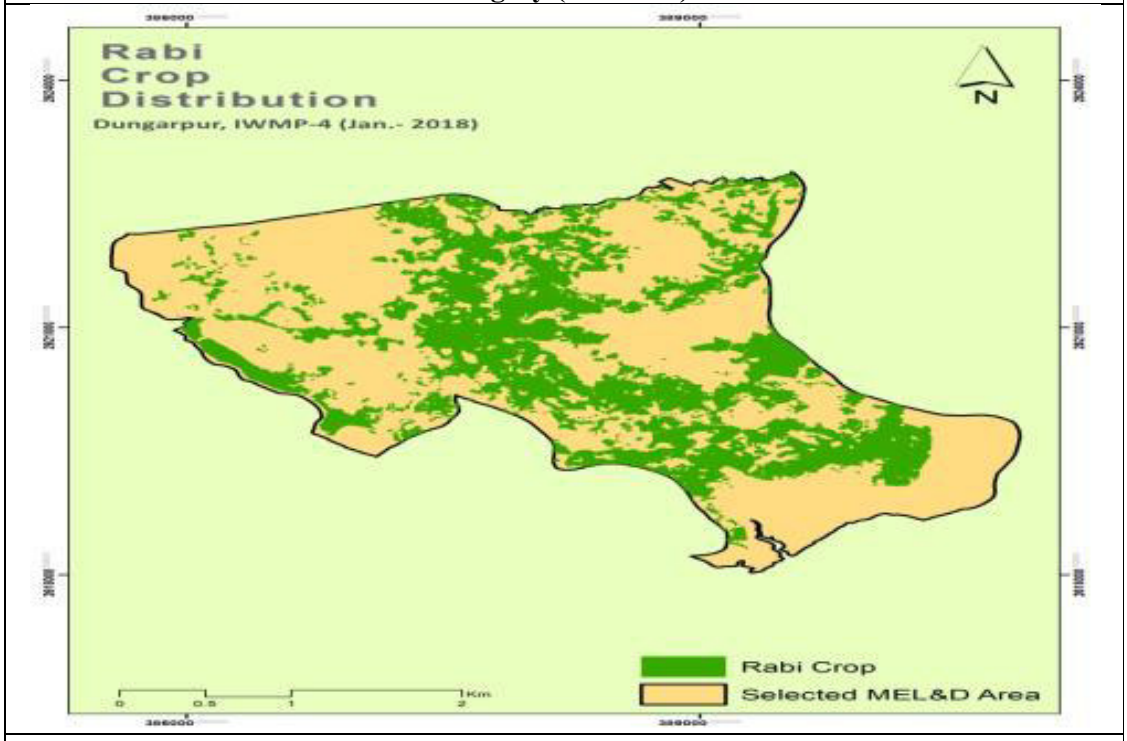
Source: Difference of Area Computed by Satellite Imagery LISSIV (Pre-Post Project, Rabi and Kharif Season)



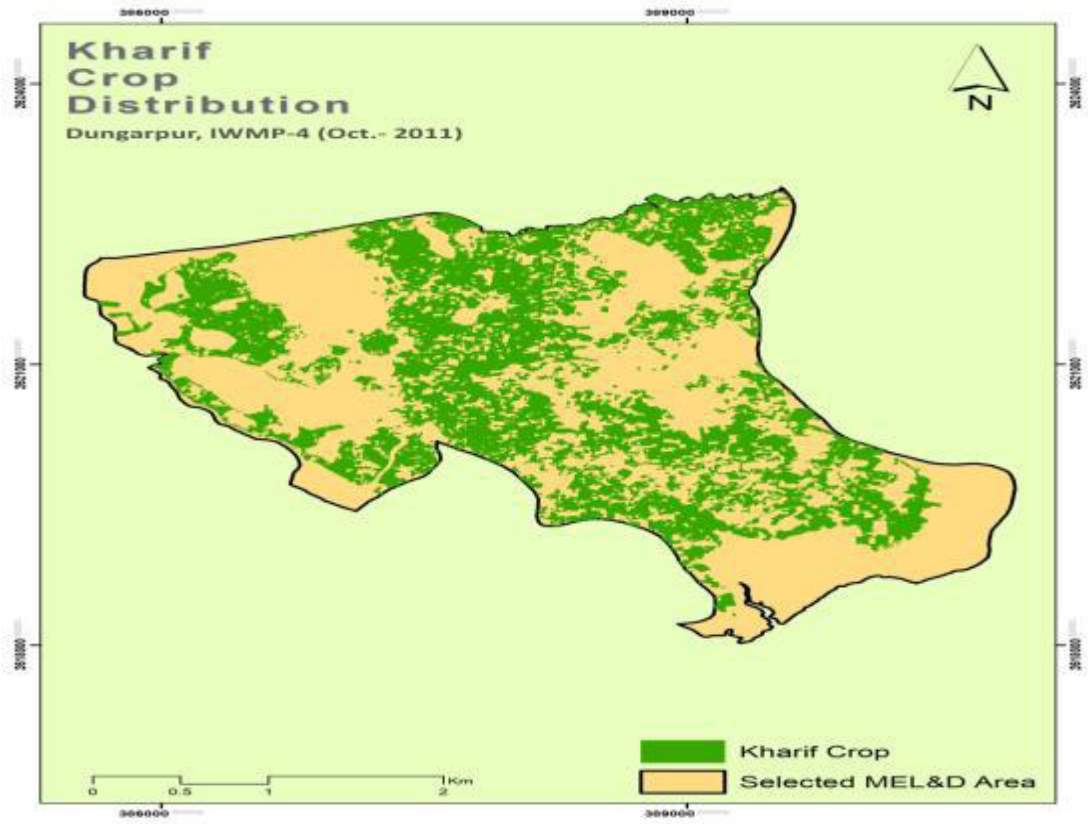
Satellite imaginary for the study area through GIS based methodology are asunder:



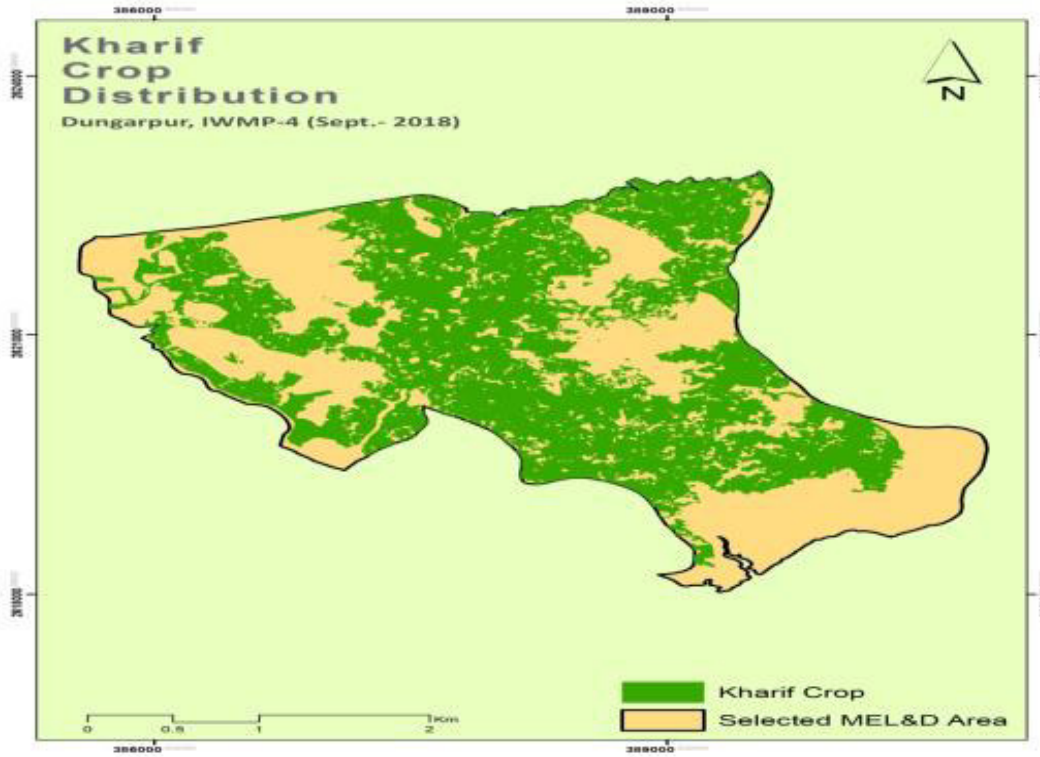
Rabi Crop Distribution in study area (Pre Project Status) computed LISS IV Imagery (Jan 2012)



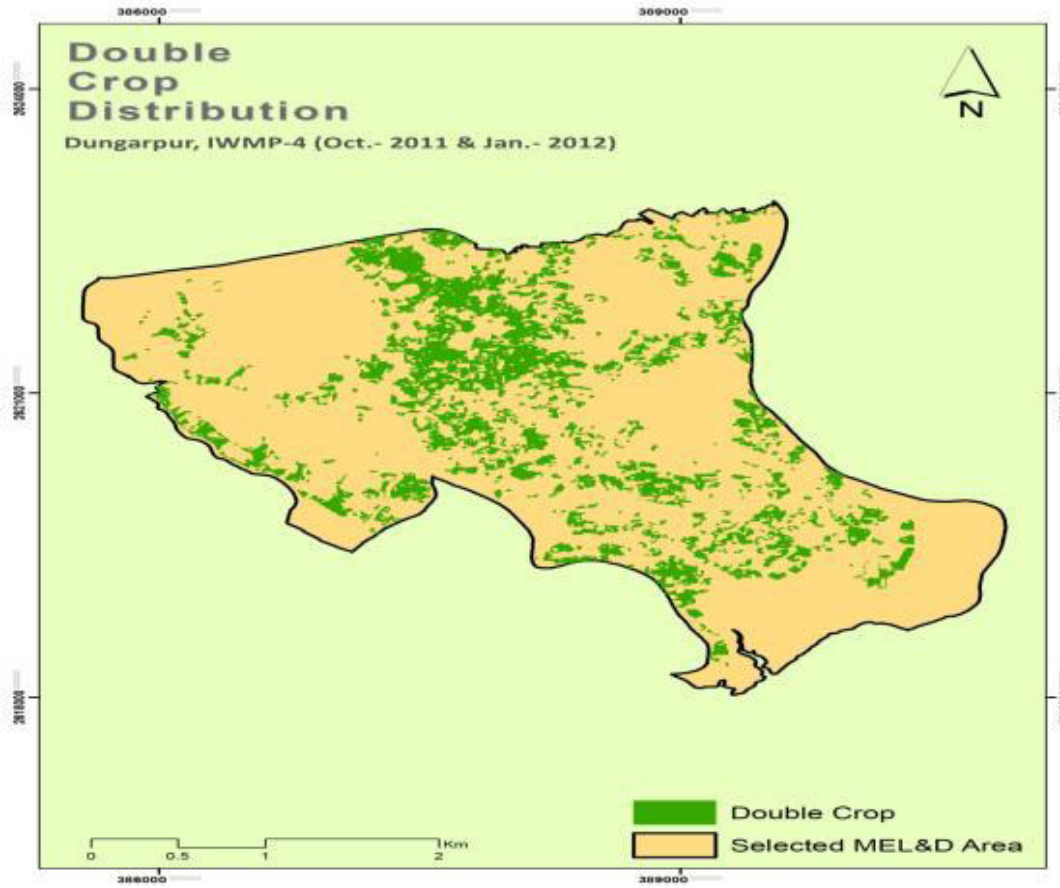
Rabi Crop Distribution in study area (Post Project Status) computed LISS IV Imagery (Jan 2018)



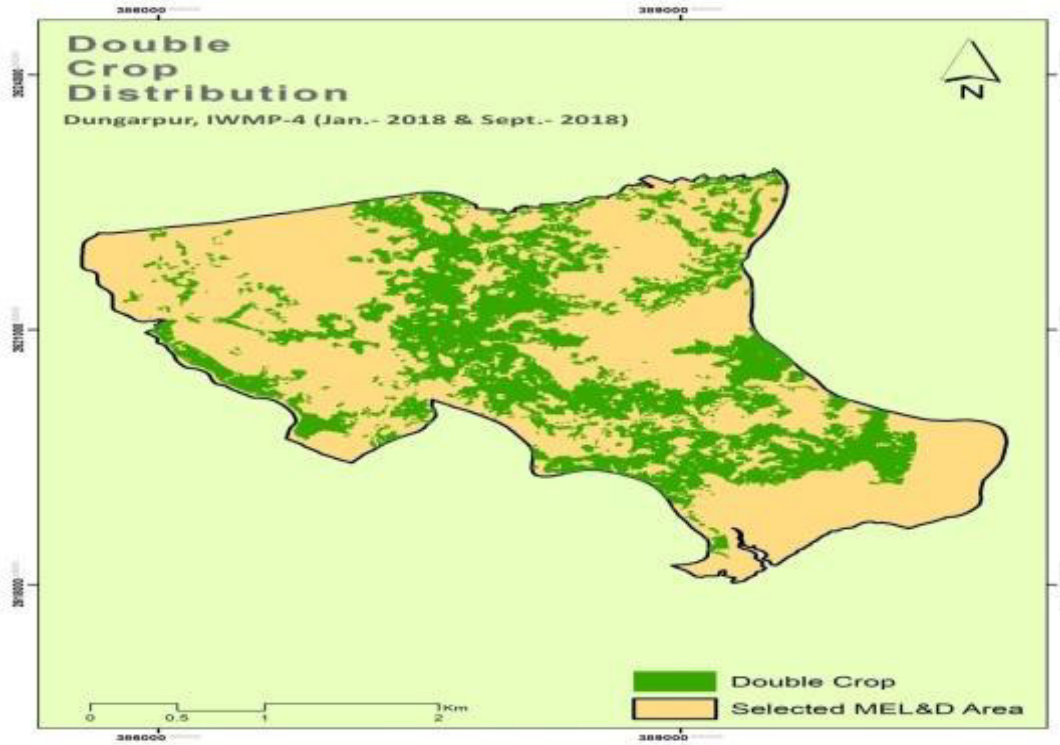
Kharif Crop Distribution in study area (Pre Project Status) computed LISS IV Imagery (Oct.2011)



Kharif Crop Distribution in study area (Post Project Status) computed LISS IV Imagery (Sept.2018)



Double Crop Distribution in study area
(Pre Project Status) computed LISS IV Imagery (Oct. 2011 & Jan 2012)



Double Crop Distribution in study area (Post Project Status) computed LISS IV Imagery(Sept 2018& 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	808.256	822.045	13.79
Built Up	37.669	40.092	2.42
Wastelands	262.093	245.106	-16.99
Water Bodies	154.941	155.716	0.78

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

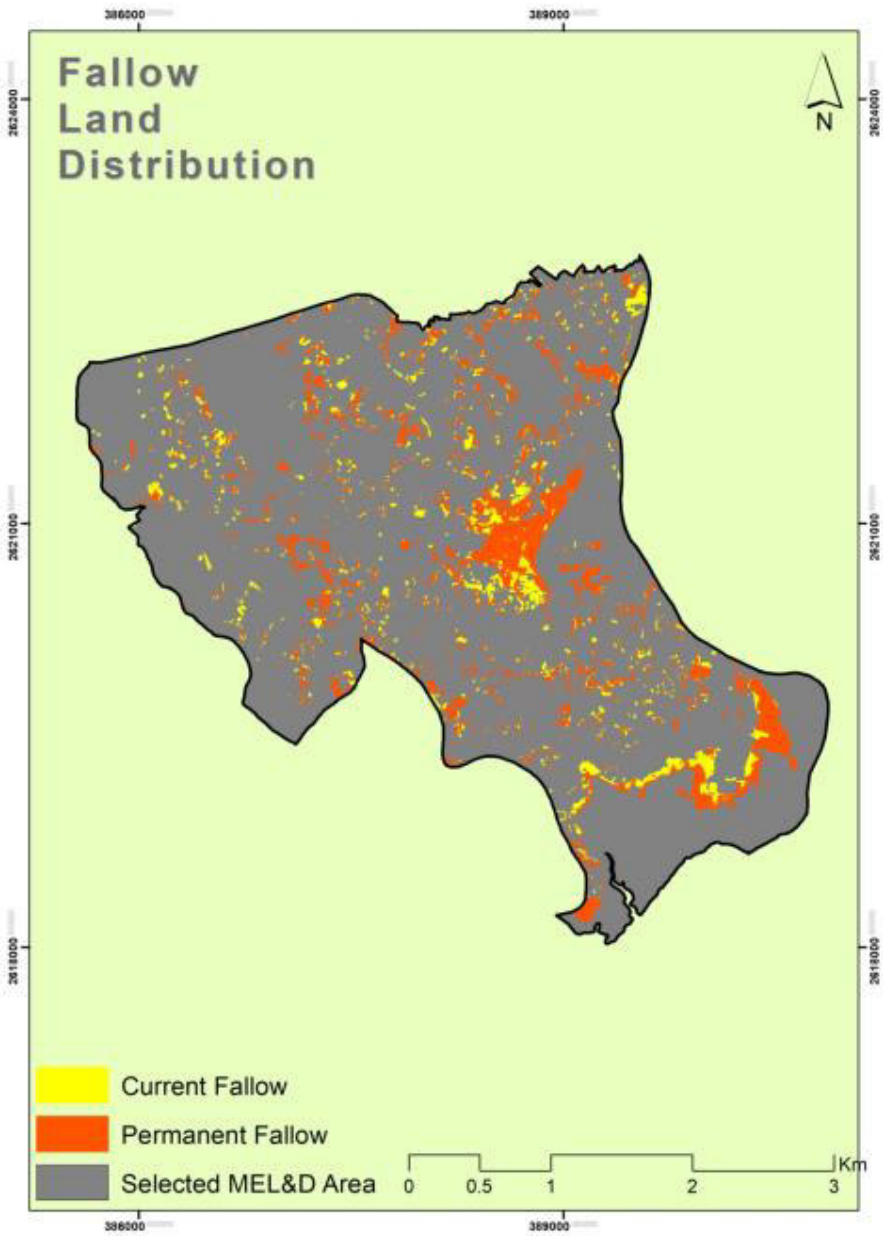


Fig. 8.4 Fallow Land Distribution

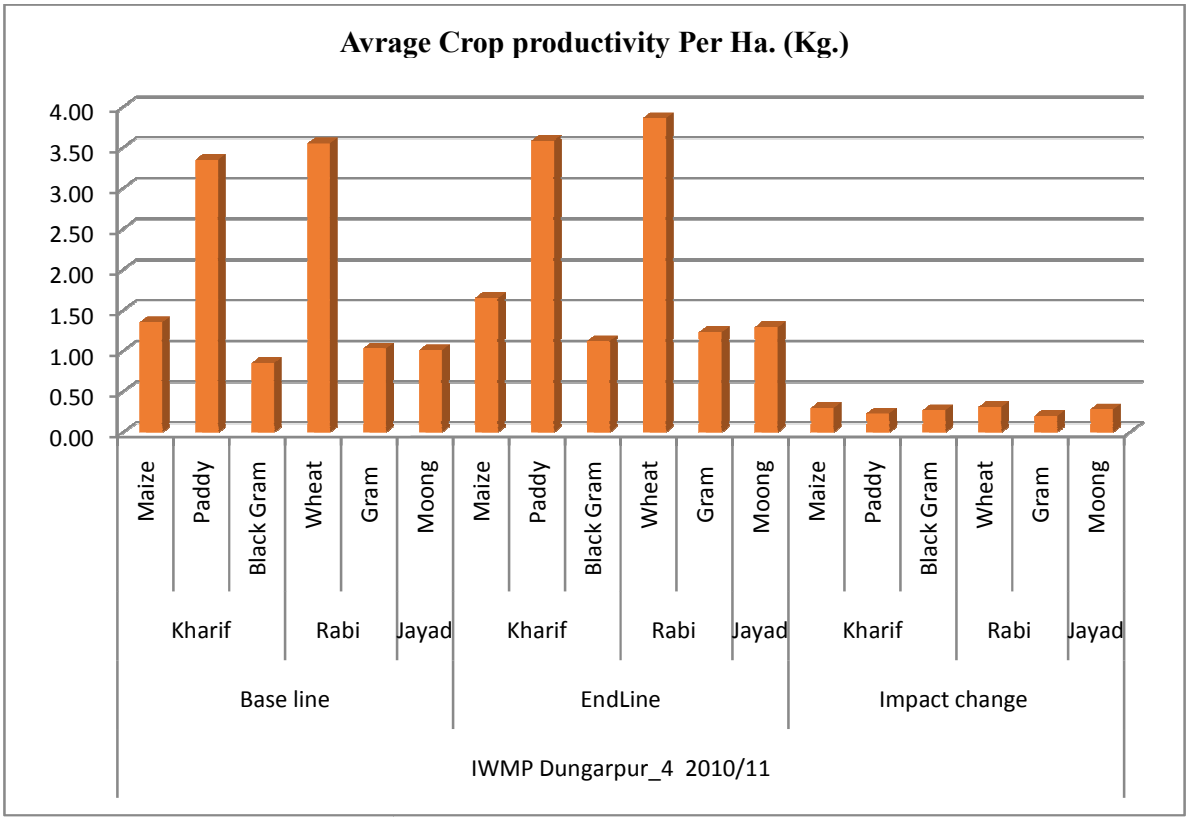
8.2.2 Productivity of Crop (Kharif, Rabi and Zaid)

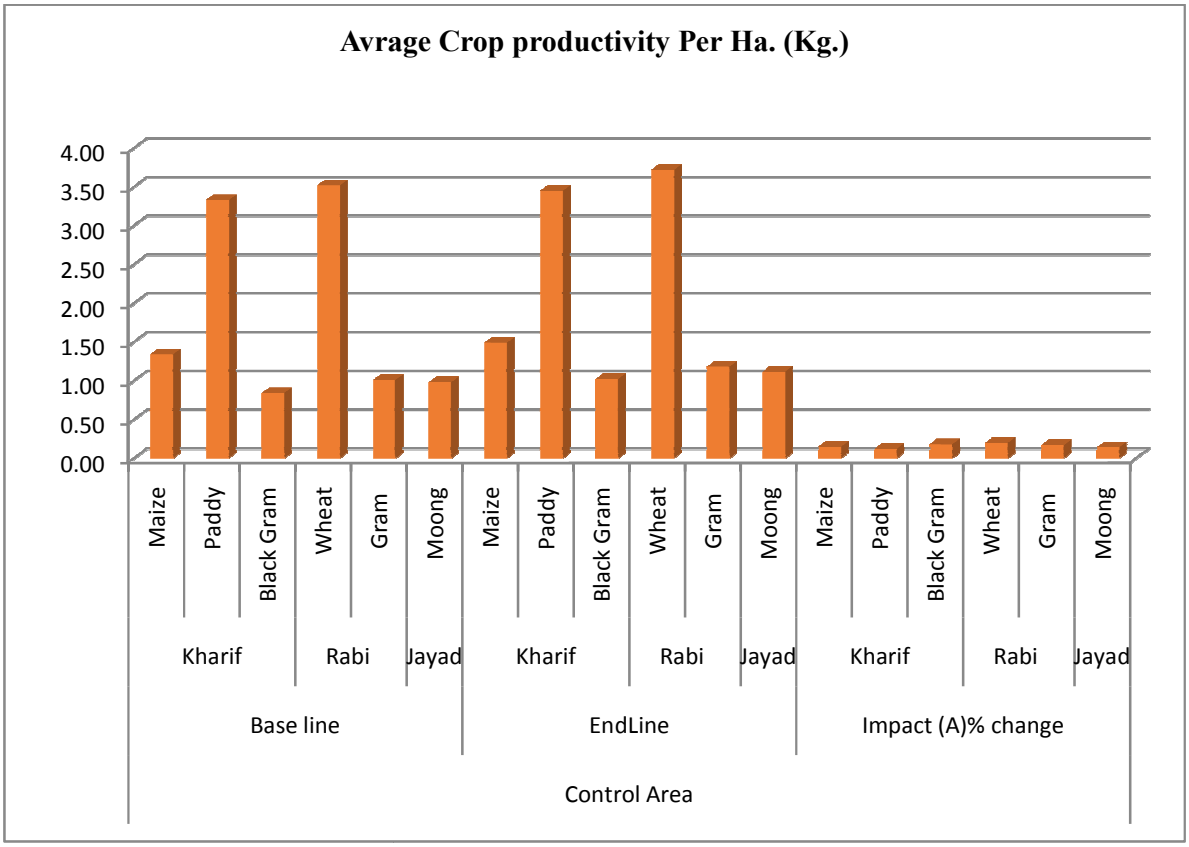
Average Crop Yield/Productivity in IWMP Watershed & Control Area (Ton/ha. & %):

Table: 8.11

IWMP/ Control Area	Timeline	Season	Crop Type	Average Crop productivity Per Ha. (Kg.)
IWMP 4/ 2010/11	**Base line**	Kharif	Maize	1.35
			Paddy	3.35
			Black Gram	0.85
		Rabi	Wheat	3.55
			Gram	1.03
		Jayad	Moong	1.01
	EndLine	Kharif	Maize	1.65
			Paddy	3.58
			Black Gram	1.12
		Rabi	Wheat	3.86
			Gram	1.23
		Jayad	Moong	1.29
	Impact change	Kharif	Maize	**0.30**
			Paddy	**0.23**
			Black Gram	**0.27**
		Rabi	Wheat	**0.31**
			Gram	**0.20**
		Jayad	Moong	**0.28**
Control Area	**Base line**	Kharif	Maize	1.34
			Paddy	3.33
			Black Gram	0.84
		Rabi	Wheat	3.52
			Gram	1.01
		Jayad	Moong	0.98
	EndLine	Kharif	Maize	1.49
			Paddy	3.45
			Black Gram	1.02
		Rabi	Wheat	3.72
			Gram	1.18
		Jayad	Moong	1.12
	Impact (A)% change	Kharif	Maize	**0.15**
			Paddy	**0.12**
			Black Gram	**0.18**
		Rabi	Wheat	**0.20**
			Gram	**0.17**
		Jayad	Moong	**0.14**

Source: Survey by MEL&D agency


Avrage Crop productivity Per Ha. (Kg.)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Maize
Paddy
Black Gram
Wheat
Gram
Moong
Kharif
Rabi
Jayad
Base line
EndLine
Impact change
IWMP Dungarpur_4 2010/11


Avrage Crop productivity Per Ha. (Kg.)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Maize
Paddy
Black Gram
Wheat
Gram
Moong
Kharif
Rabi
Jayad
Base line
EndLine
Impact (A)% change
Control Area

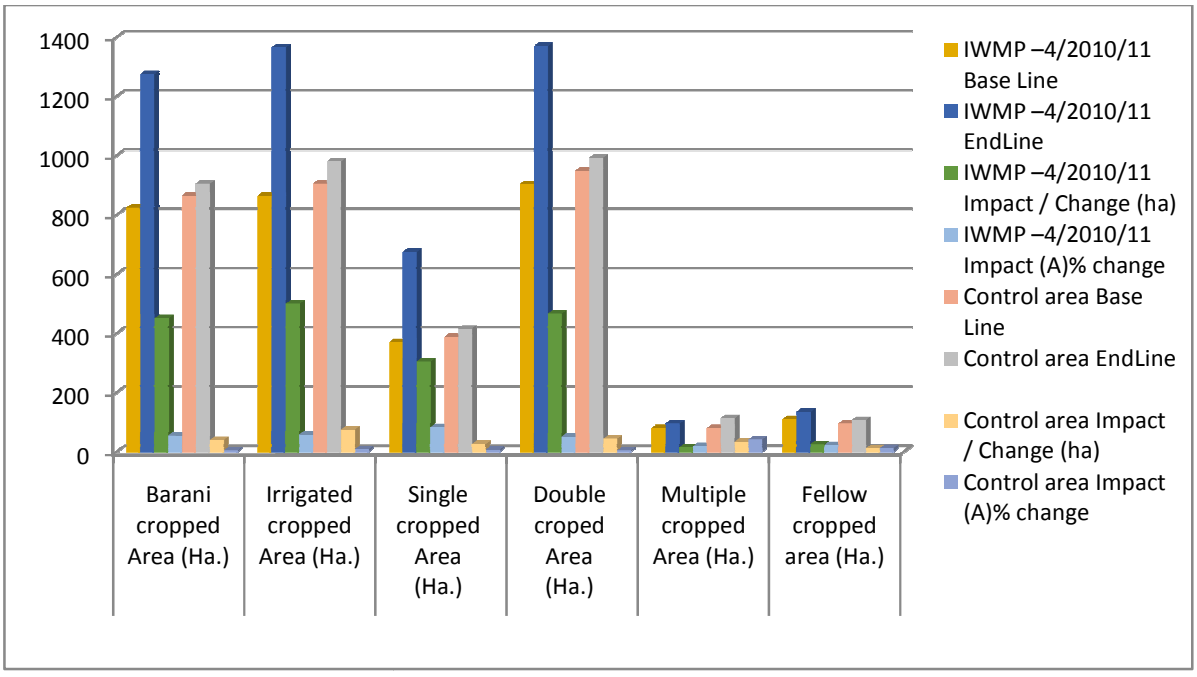
8.2.3 Cropping Pattern Change (Kharif, Rabi and Zaid)

Cropping pattern and diversification in IWMP Watersheds and Control Area

Table: 8.12

IWMP/ Control Area	Timeline	Cropping pattern and diverfication					
		Baranicropped Area (Ha.)	Irrigated cropped Area (Ha.)	Single cropped Area (Ha.)	Double cropedArea (Ha.)	Multiple cropped Area (Ha.)	Fellow cropped area (Ha.)
IWMP – 4/2010/11	**Base Line**	824	865	370	904	80	110
	EndLine	1275	1365	675	1370	95	135
	Impact / Change (ha)	451	500	305	466	15	25
	Impact (A)% change	**54.8**	**57.8**	**82.4**	**51.6**	**18.8**	**22.7**
Control area	**Base Line**	865	905	388	949	80	95
	EndLine	905	980	415	993	113	107
	Impact / Change (ha)	40	75	27	44	33	12
	Impact (A)% change	**4.6**	**8.3**	**7.0**	**4.6**	**41.3**	**12.6**

Source: Survey by MEL&D agency

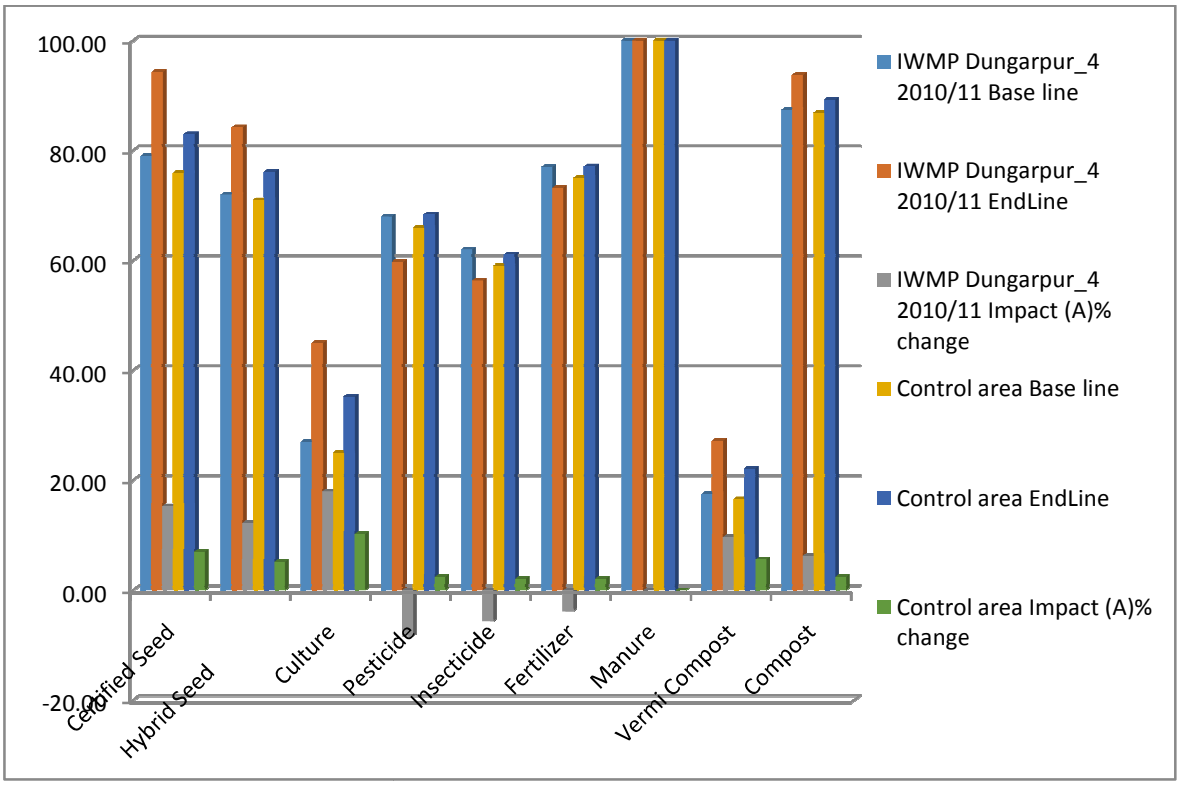


8.2.4 Adoption of new package of practices in IWMP Watershed and Control Area (%):

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–4 /2010-11	**Base line**	79.00	72.00	27.00	68.00	62.00	77.00	100.00	17.55	87.45
	EndLine	94.28	84.25	45.00	59.75	56.35	73.25	100.00	27.20	93.75
	Impact (A)% change	**15.28**	**12.25**	**18.00**	**-8.25**	**-5.65**	**-3.75**	**0.00**	**9.65**	**6.30**
Control area	**Base line**	76.00	71.00	25.00	66.00	59.00	75.00	100.00	16.56	86.86
	EndLine	83.00	76.15	35.24	68.38	61.10	77.12	100.00	22.15	89.27
	Impact (A)% change	**7.00**	**5.15**	**10.24**	**2.38**	**2.10**	**2.12**	**0.00**	**5.59**	**2.41**

Source: Survey by MEL&D agency



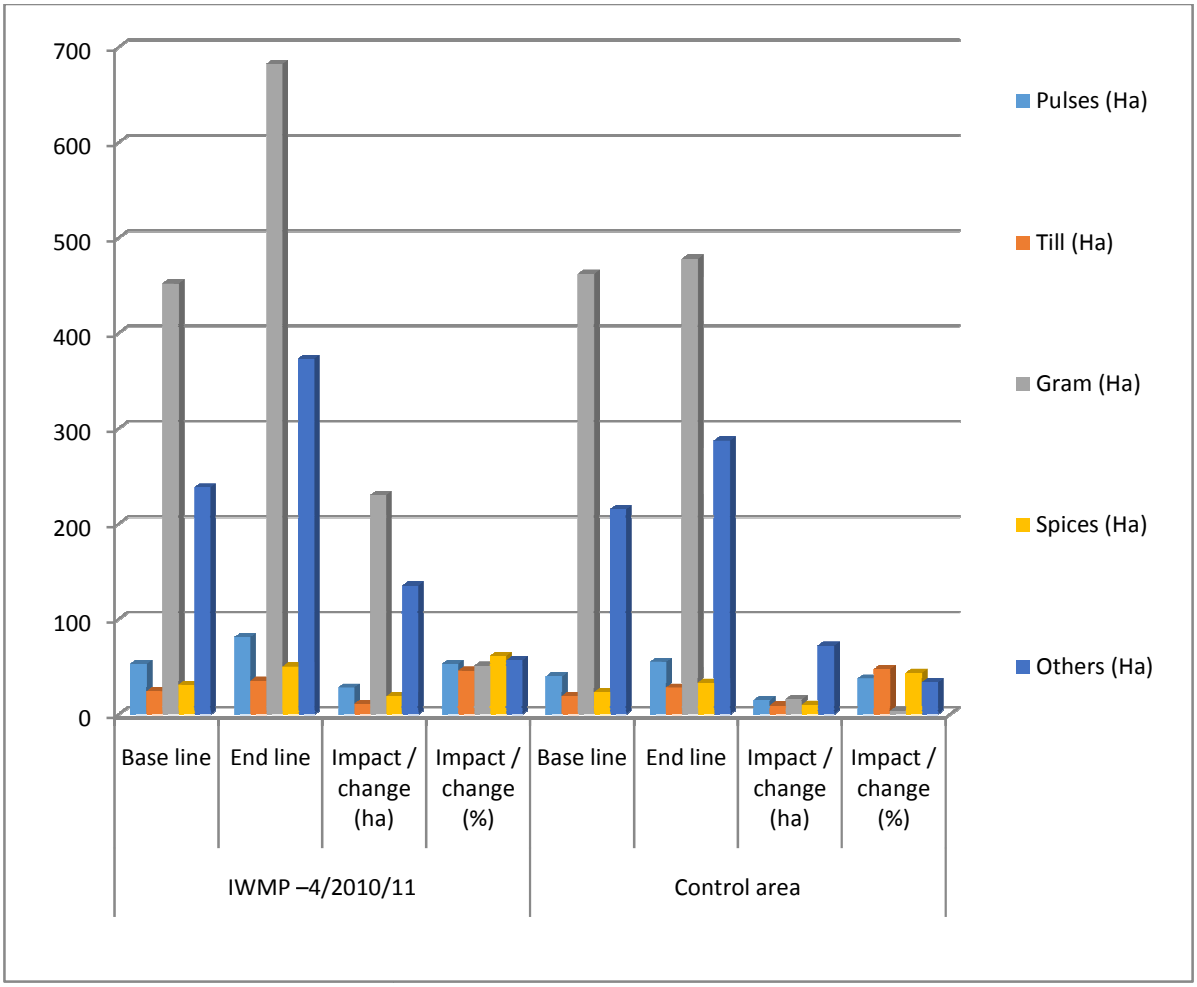
8.2.5 Change in Commercial food, fodder and horticulture crops:

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–4 /2010-11	Base line	53	24	452	31	238
	End line	81	35	682	50	373
	Impact/change (ha)	**28**	**11**	**230**	**19**	**135**
	Impact / change (%)	**52.83**	**45.83**	**50.88**	**61.29**	**56.72**
Control area	Base line	40	19	462	23	215
	End line	55	28	478	33	287
	Impact / change (ha)	**15**	**9**	**16**	**10**	**72**
	Impact / change (%)	**37.50**	**47.37**	**3.46**	**43.48**	**33.49**

Source: Survey by MEL&D agency

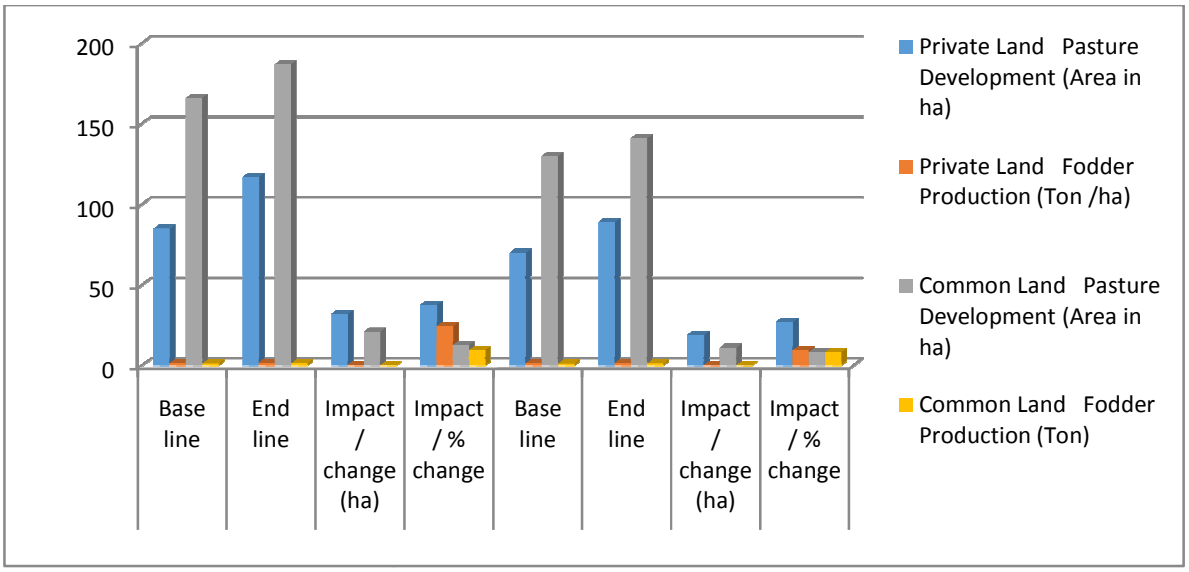


Changes in Fodder Production (Non-brow sable tree species and local grass) in IWMP and Control Area:

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–4 /2010-11	Base line	85	1.35	166	1.15
	End line	117	1.68	187	1.26
	Impact / change (ha)	**32**	**0.33**	**21**	**0.11**
	Impact / change (%)	**37.65**	**24.44**	**12.65**	**9.57**
Control area	Base line	70	1.27	130	1.09
	End line	89	1.39	141	1.18
	Impact / change (ha)	**19**	**0.12**	**11**	**0.09**
	Impact / change (%)	**27.14**	**9.45**	**8.46**	**8.26**

Source: Survey by MEL&D agency

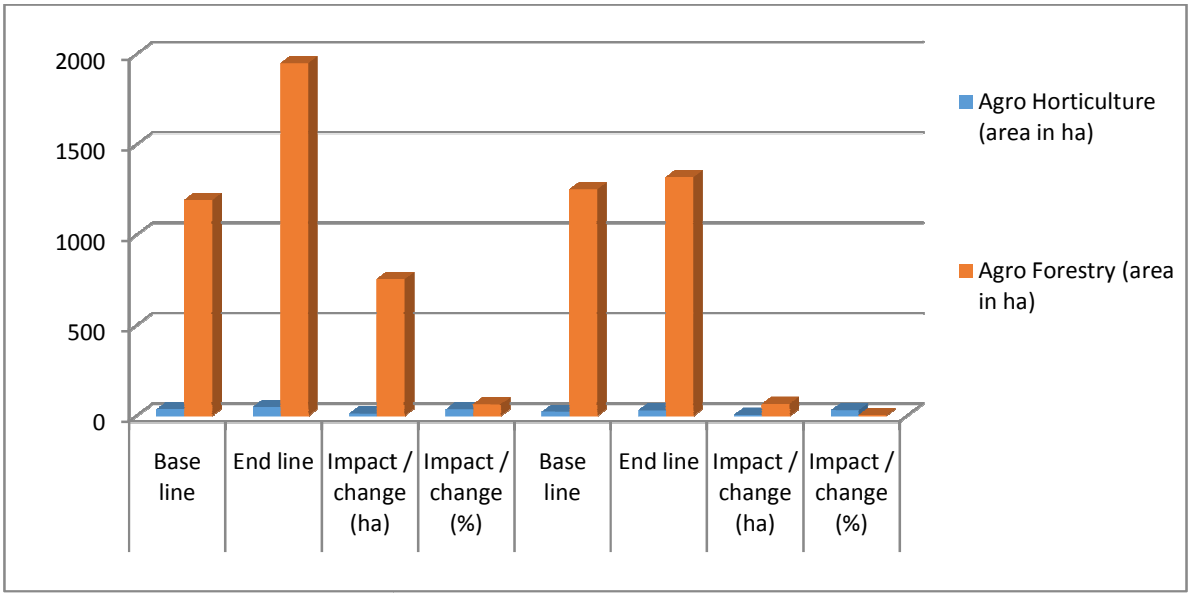


Changes in Agro-horticulture, Agro forestry in IWMP and Control Area:

Table: 8.16

IWMP/ Control Area	Time line	Agro Horticulture (area in ha)	Agro Forestry (area in ha)
1	2	3	4
IWMP–4 /2010-11	Base line	37	1194
	End line	50	1950
	Impact / change (ha)	**13**	**756**
	Impact / change (%)	**35.14**	**63.36**
Control area	Base line	23	1253
	End line	30	1320
	Impact / change (ha)	**7**	**67**
	Impact / change (%)	**30.43**	**5.35**

Source: Survey by MEL&D agency



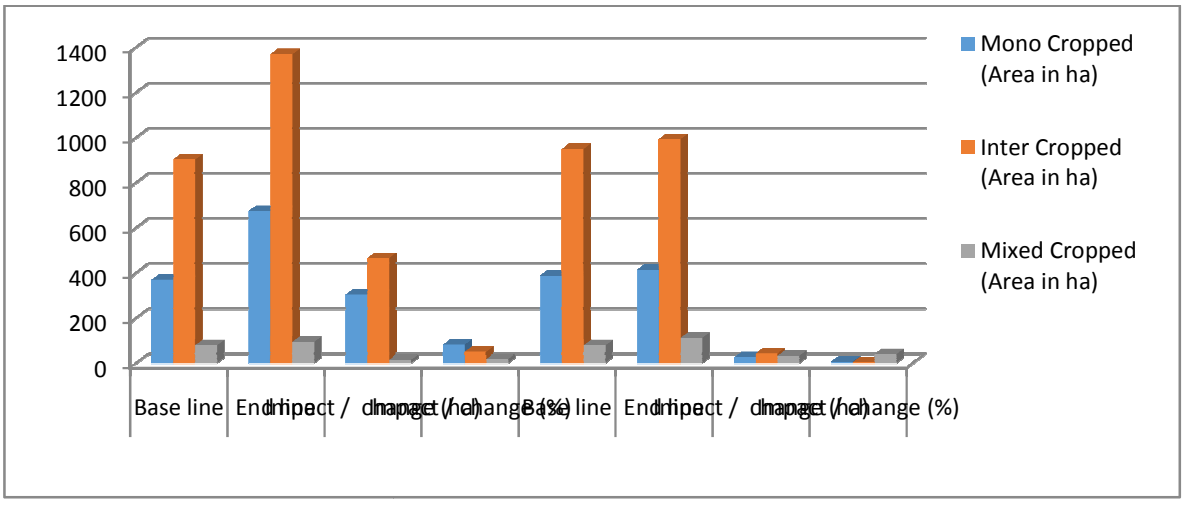
8.2.6 Shift from Mono cropping to Inter Cropping / Mixed Cropping:

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–4 /2010-11	Base line	370	904	80
	End line	675	1370	95
	Impact / change (ha)	**305**	**466**	**15**
	Impact / change (%)	**82.42**	**51.61**	**18.75**
Control area	Base line	388	949	80
	End line	415	993	113
	Impact / change (ha)	**27**	**44**	**33**
	Impact / change (%)	**6.96**	**4.64**	**41.25**

Source: Survey by MEL&D agency



8.2.7 Area under Degraded and Waste Lands:

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

Table: 8.18

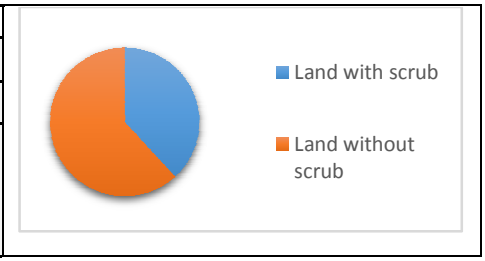
Land use Class	AreaPre (Ha)	AreaPost(Ha)	Difference (Ha)
Wastelands	262.093	245.106	-16.99

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

(A) Pre - project Classification of Wastelands

Table: 8.19

1	2	3
Land use Class	Area (Ha)	Area (%)
Land with scrub	100.014	38.160
Land without scrub	162.079	61.840

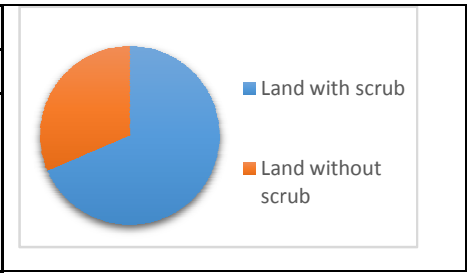


Source: GIS Report by MEL&D agency

(B) Post – project Classification of Wastelands

Table: 8.20

Landuse Class	Area (Ha)	Area (%)
Land with scrub	167.909	68.505
Land without scrub	77.197	31.495



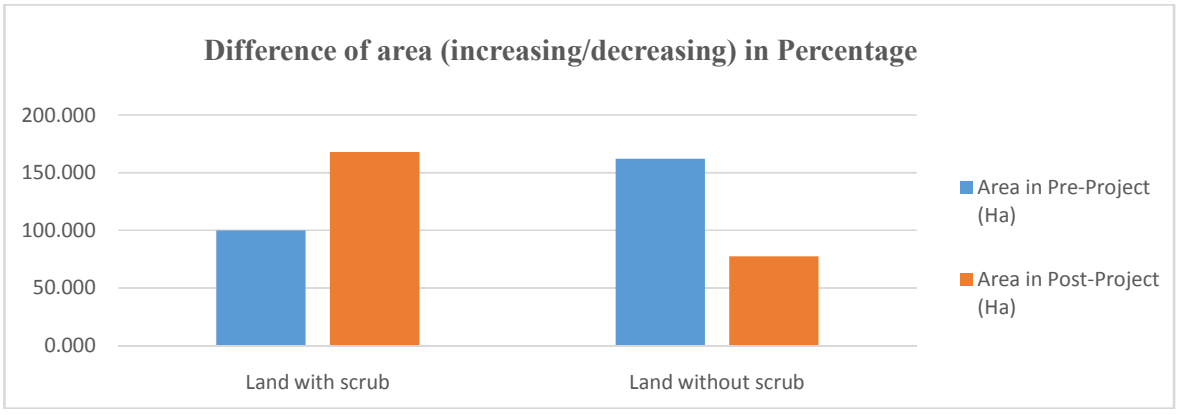
Source: GIS Report by MEL&D agency

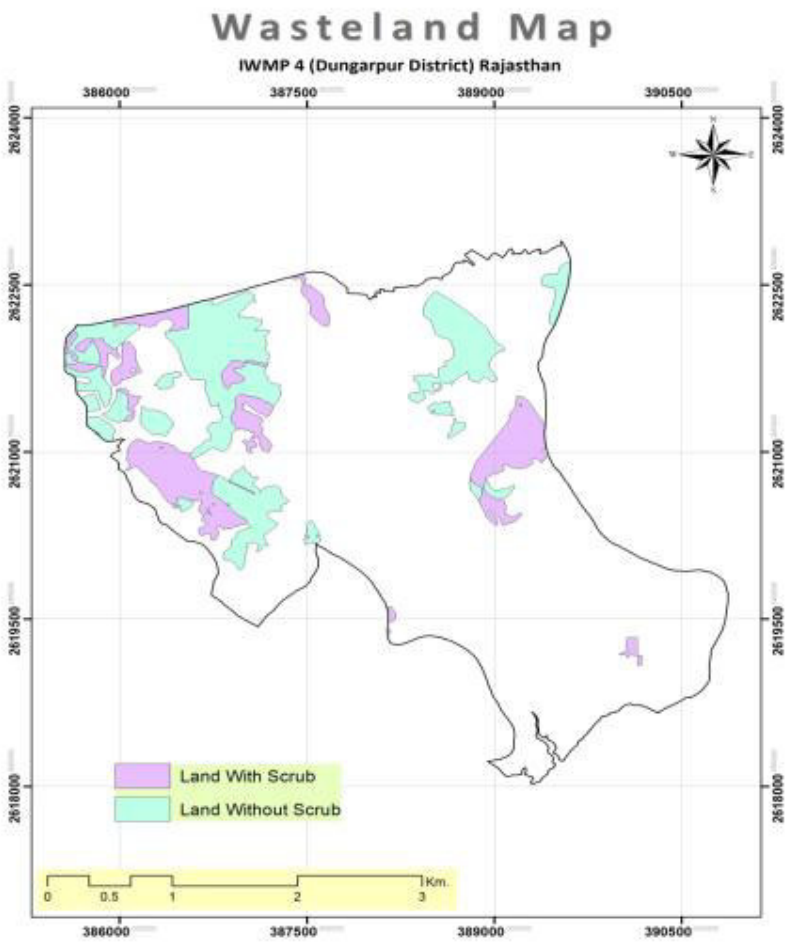
Difference of area (increasing /decreasing) in Hectare

Table: 8.21

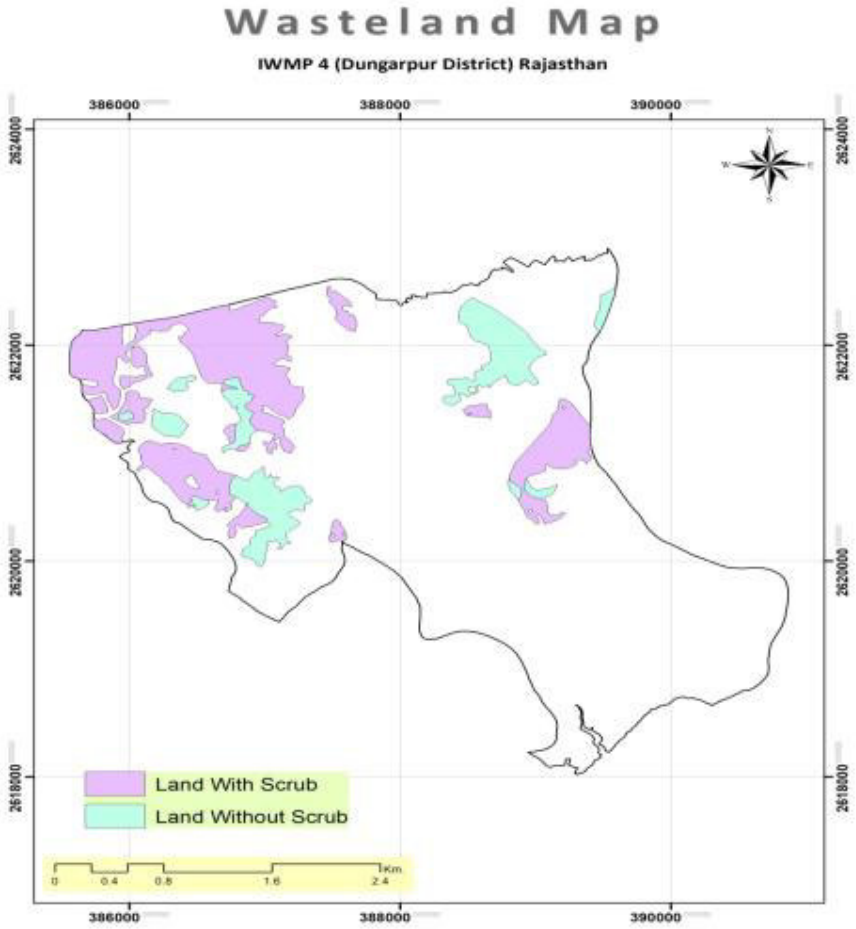
Land use Class	Area Pre (Ha)	Area Post (Ha)	Difference (Ha)
1	2	3	4
Land with scrub	100.014	167.909	67.896
Land without scrub	162.079	77.197	-84.882

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

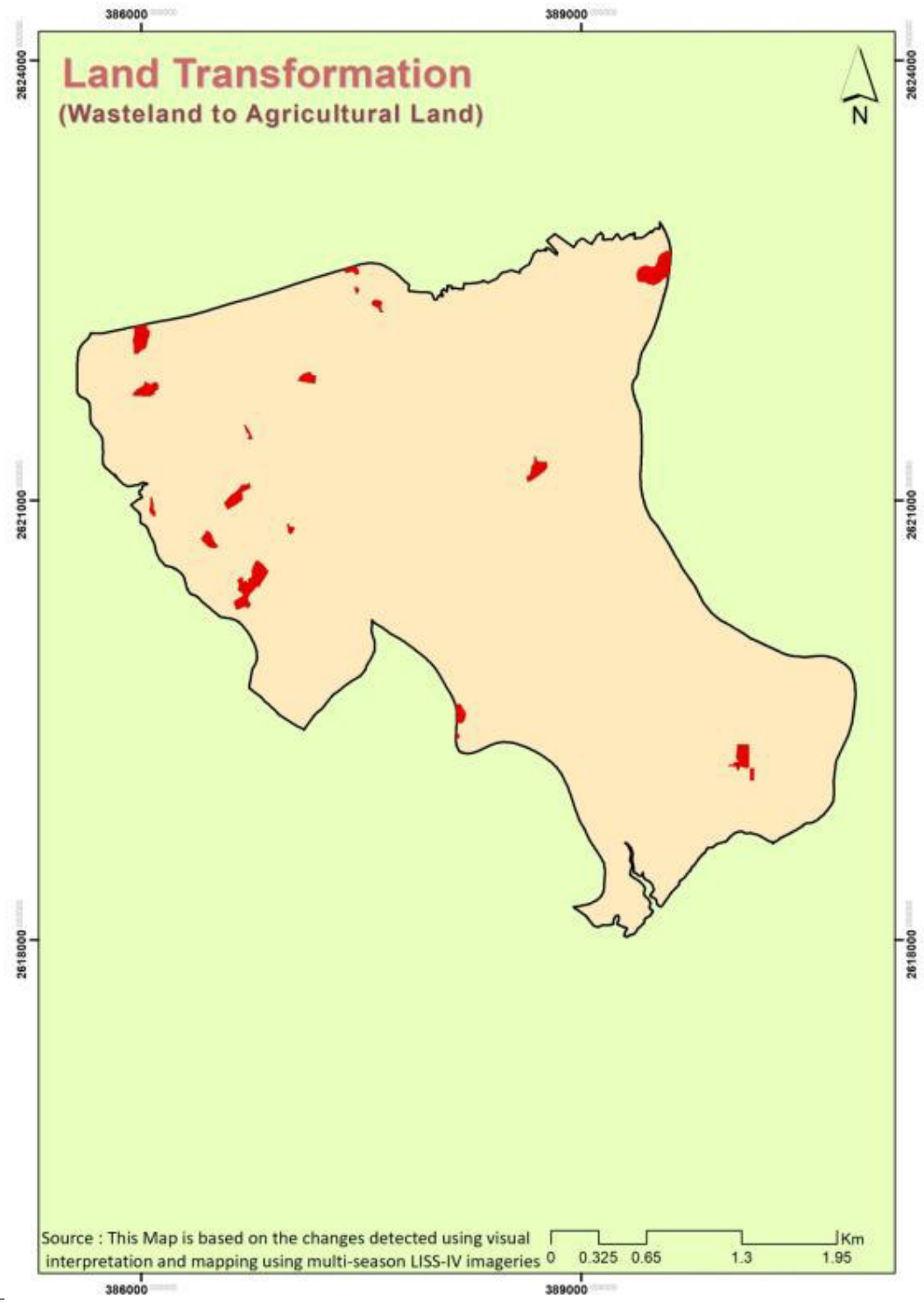




Wasteland Distribution using Visual Interpretation (Pre Project Status) computed LISS IV Imagery



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



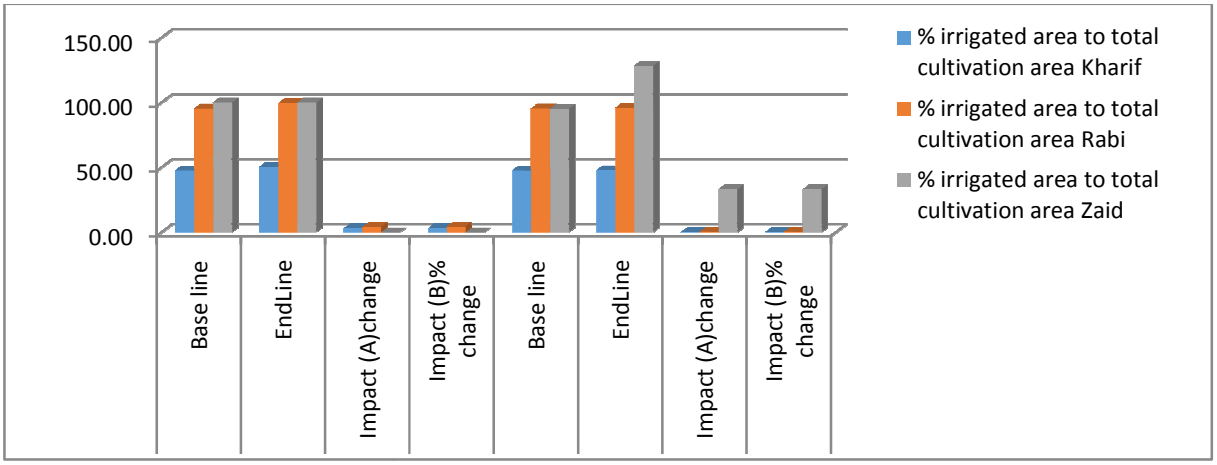
This Map is based on the changes detected using visual interpretation and mapping using multi Season LISS IV imageries

8.2.8 Area under Irrigation:

Table: 8.22

IWMP/ Control Area	Timeline	Kharif			Rabi				Jayad	% irrigated area to total cultivation area		
		Maize	Others	Total	Mustard	Wheat	Others	Total	Total	Kharif	Rabi	Zaid
1	2	3	4	5	6	7	8	9	10	11	12	13
IWMP–4/2010-11	Base line	811	383	1194	452	201	171	824	80	47.58	95.31	100.00
	End line	1370	580	1950	682	325	268	1275	95	50.56	99.61	100.00
	Impact / change (ha)	**559**	**197**	**756**	**230**	**124**	**97**	**451**	**15**	**2.98**	**4.30**	**0.00**
	Impact / % change	**68.9**	**51.6**	**63.4**	**50.9**	**61.7**	**57.1**	**54.8**	**18.8**	**2.98**	**4.30**	**0.00**
Control area	Base line	835	418	1253	462	223	180	865	84	47.57	95.38	95.24
	End line	875	445	1320	478	237	190	905	88	47.73	95.80	128.41
	Impact / change (ha)	**40**	**27**	**67**	**16**	**14**	**10**	**40**	**4**	**0.16**	**0.43**	**33.17**
	Impact / % change	**4.8**	**6.5**	**5.3**	**3.5**	**6.3**	**5.6**	**4.6**	**4.8**	**0.16**	**0.43**	**33.17**

Source: Survey results of MEL&D agency Arpan



8.2.9 Vegetation Density:

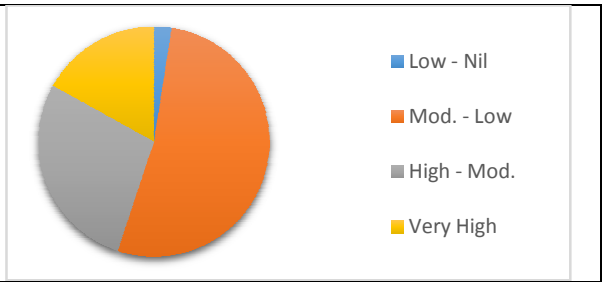
LISS-IV imagery belonging to Rabi season of pre and post project times are used for computing NDVI and further classified using natural breaks in histogram. NDVI model is computed using two bands i.e. Near Infra-red and Red. The NIR band records good reflection of vegetated areas and is built mainly for vegetation studies. Fig. 8.5 shows a conceptual model of how NDVI is computed. ArcGIS 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 bellows 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

Vegetation Index	Area (Ha)	Area (%)
1	2	3
Low - Nil	30.745	2.434
Mod. - Low	664.849	52.642
High - Mod.	353.571	27.995
Very High	213.795	16.928

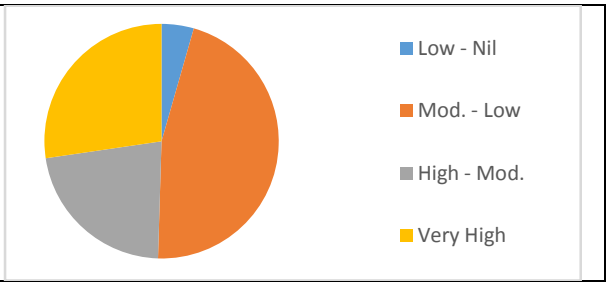


Source: Vegetation Density of Rabi season Computed as per satellite Imagery LISSIV(Pre-project Status)

(B): Post Classification of Vegetation Index

Table: 8.24

Vegetation Index	Area (Ha)	Area (%)
1	2	3
Low - Nil	55.67	4.41
Mod. - Low	582.38	46.11
High - Mod.	279.53	22.13
Very High	345.38	27.35



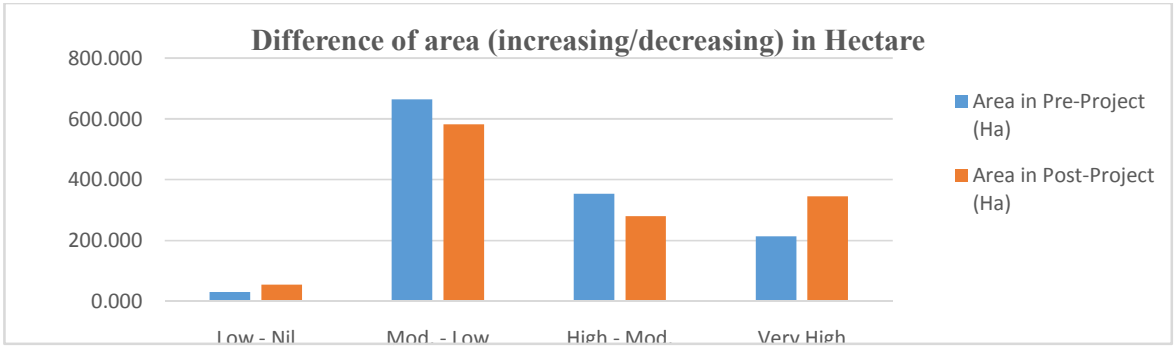
Source: Vegetation Density of Rabi season Computed as per satellite Imagery LISSIV(Post-project Status)

Difference of area (increasing /decreasing) in Hectare

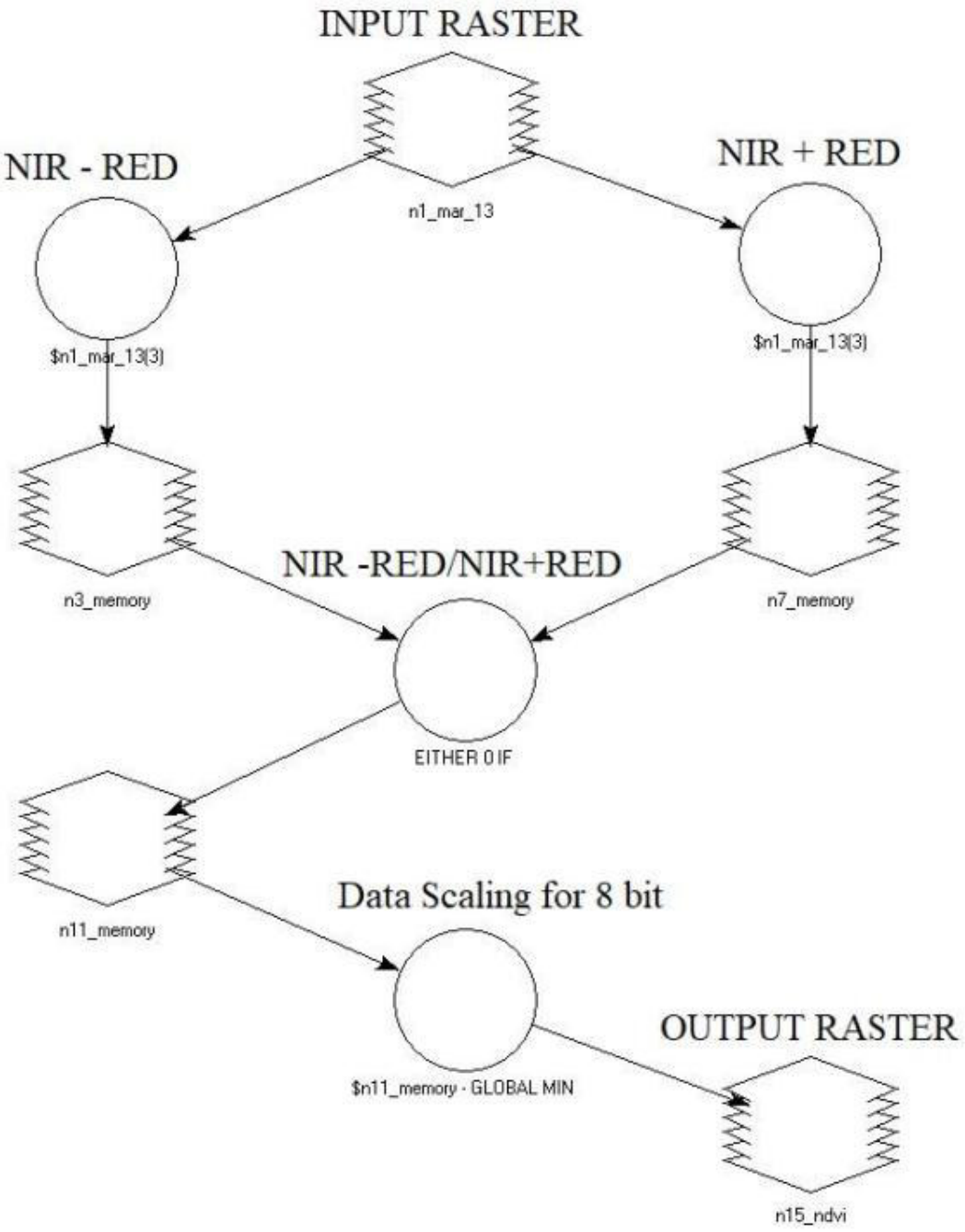
Table: 8.25

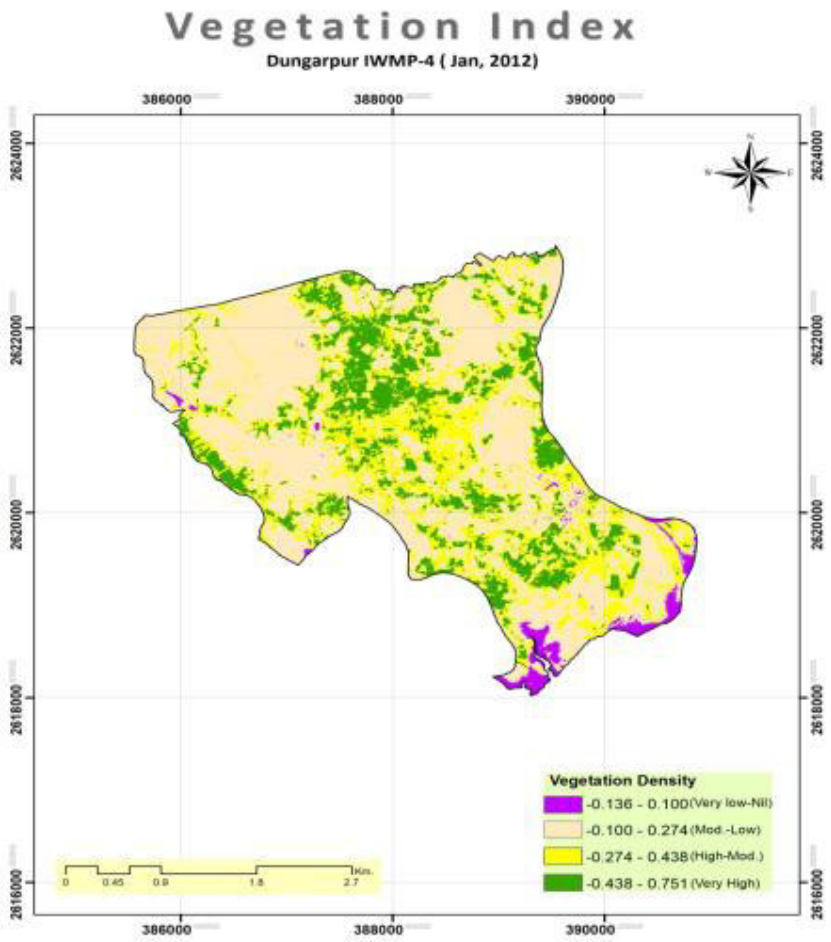
Vegetation Index	Area Pre (Ha)	Area Post Ha)	Difference
1	2	3	4
Low - Nil	30.745	55.67	24.92
Mod. - Low	664.849	582.38	-82.47
High - Mod.	353.571	279.53	-74.04
Very High	213.795	345.38	131.58

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

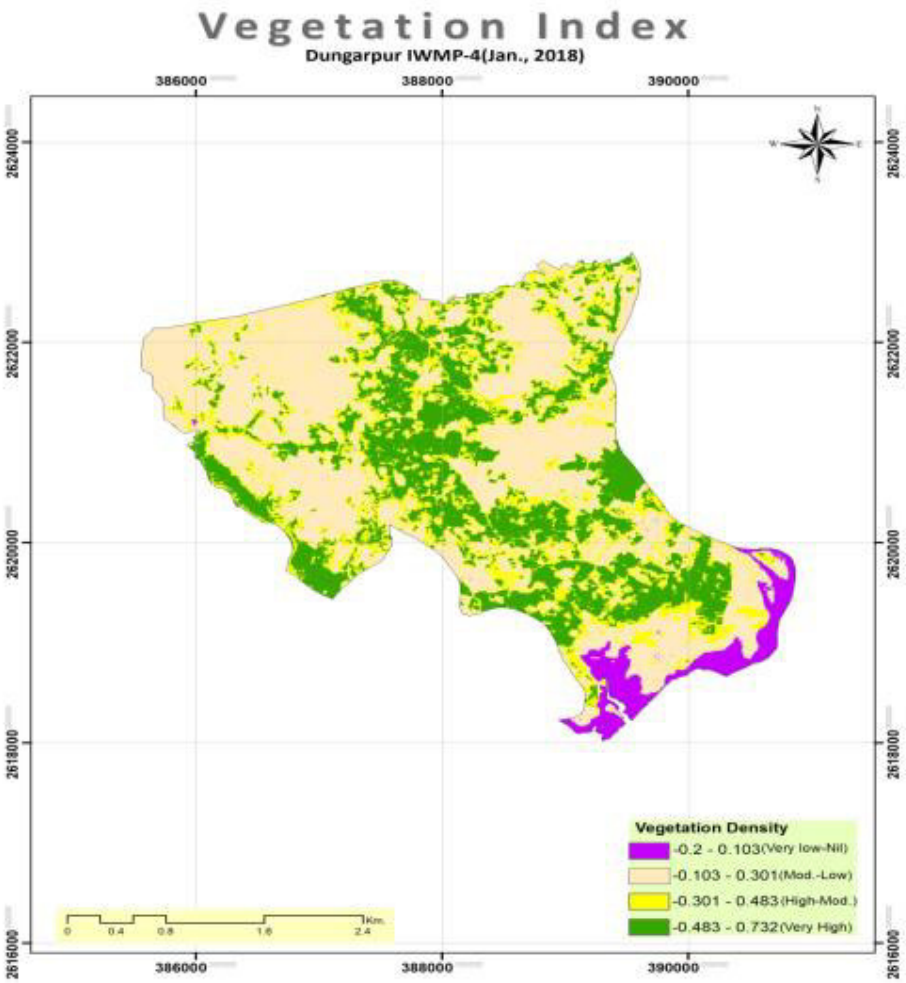


Normalized Difference Vegetation Index

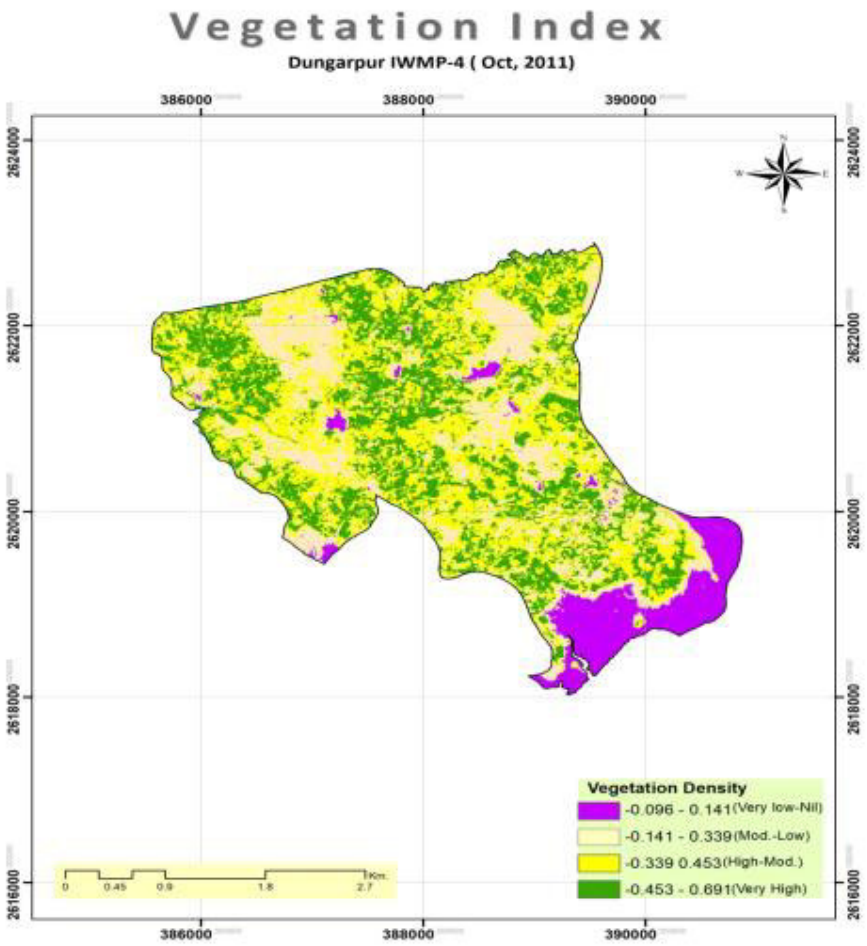




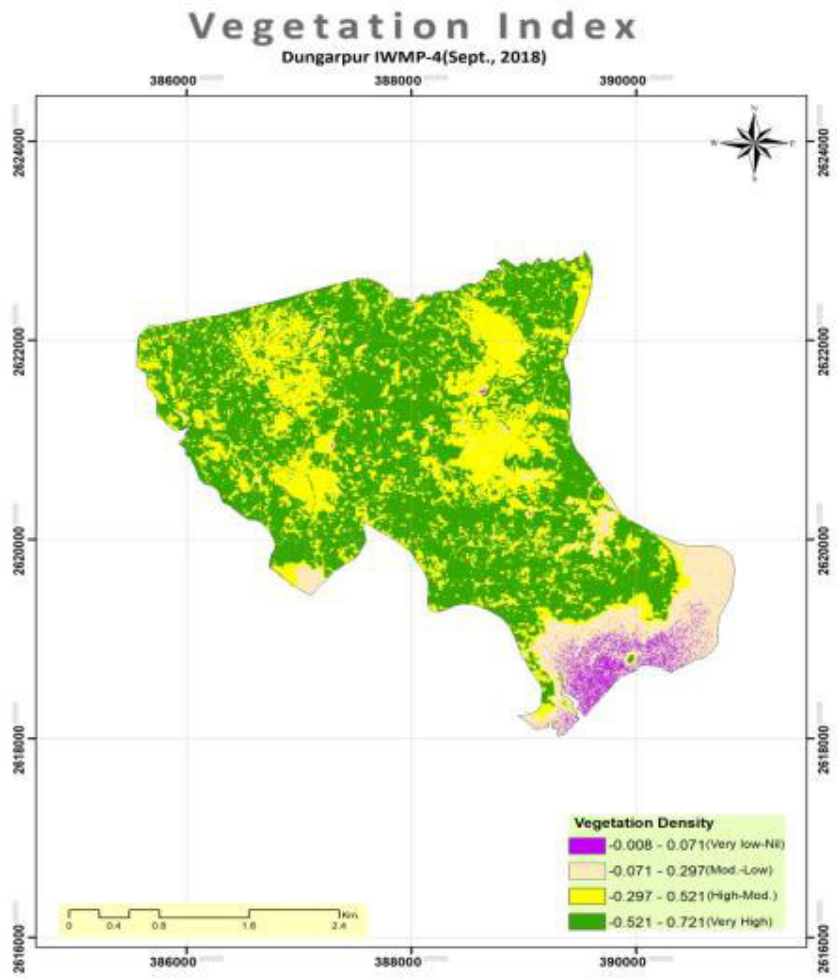
Vegetation Density using NDVI in study area Rabi Season (Pre Project Status – Jan 2012) computed LISS IV Imagery



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



Vegetation Density using NDVI in study area Kharif Season (Pre Project Status Oct. 2011) computed LISS IV Imagery



Vegetation Density using NDVI in study area Kharif Season (Post Project Status Sept 2018) computed LISS IV Imagery

8.2.10 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.8.8 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 (202.41)	Perennial Crops	26.322
2	Waste lands (262.09)	Agricultural	16.95
3	Agriculture	Built Up/Waterbodies	3.16

Source: GIS Report by MEL&D agency

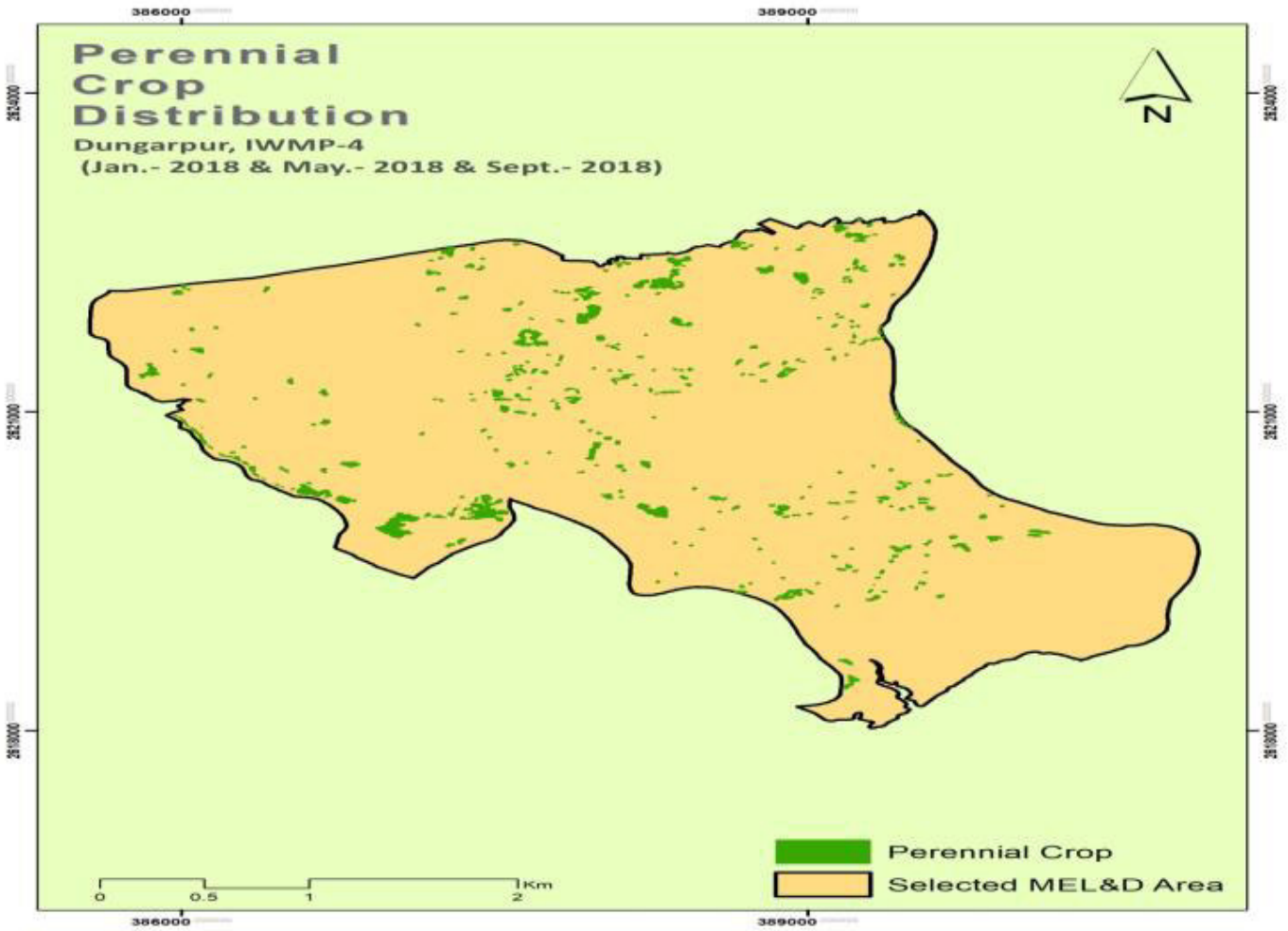


Fig. 8.8 Perennial crop distribution in the study area Computed LISS IV Imagery (Sept 2018 – Kharif&Jan 2018 – Rabi &May 2018 – Jayad)

8.2.11 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.

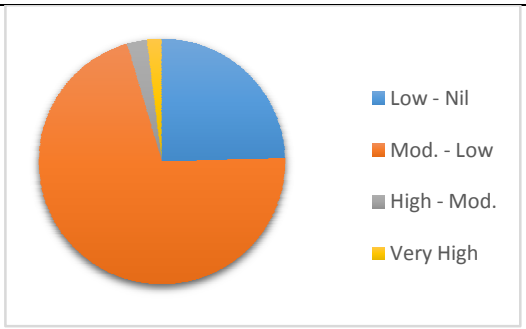
NDWI = (Green - IR) / (Green + IR)

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	309.83	24.53
Mod. - Low	895.71	70.92
High - Mod.	32.89	2.60
Very High	24.52	1.94

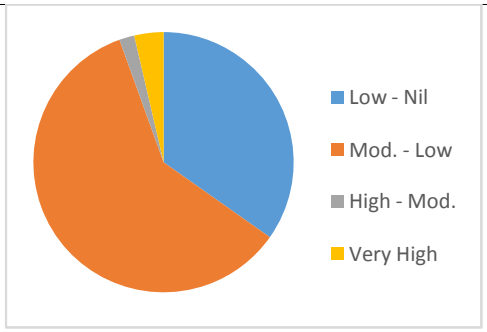


Source: Moisture Density Kharif season Computed as per satellite Imagery LISSIV (Pre project Status)

(B): Post Classification of Soil Moisture

Table: 8.28

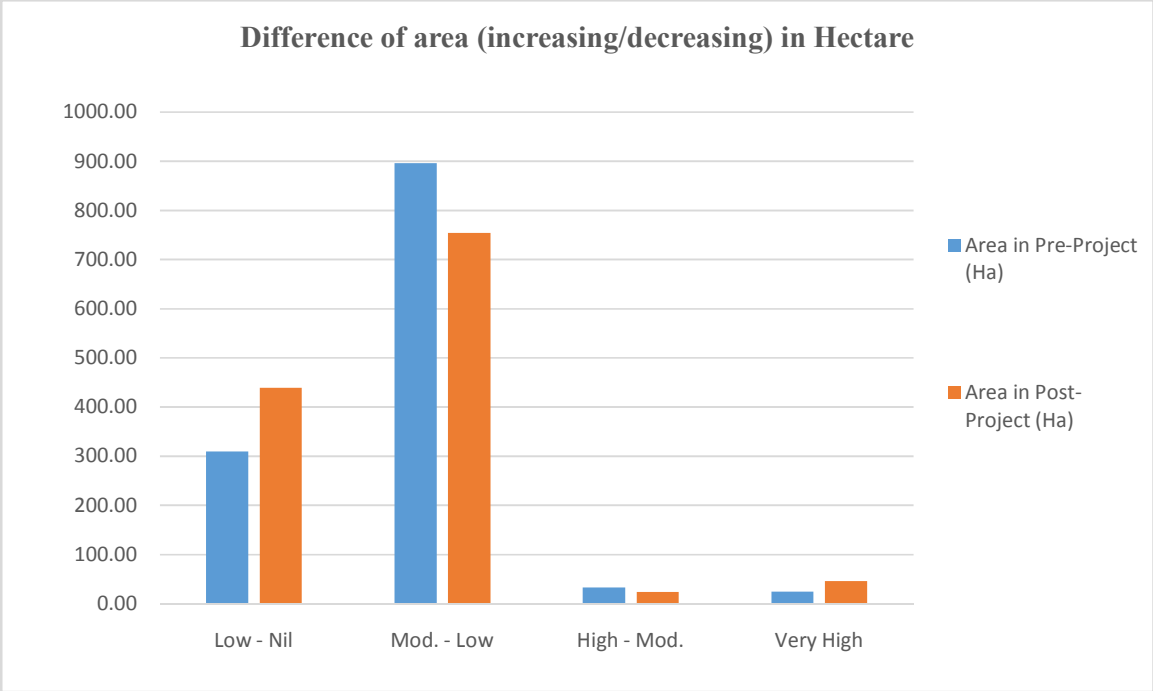
Soil Moisture	Area (Ha)	Area (%)
1	2	3
Low - Nil	439.31	34.78
Mod. - Low	754.10	59.71
High - Mod.	23.69	1.88
Very High	45.86	3.63



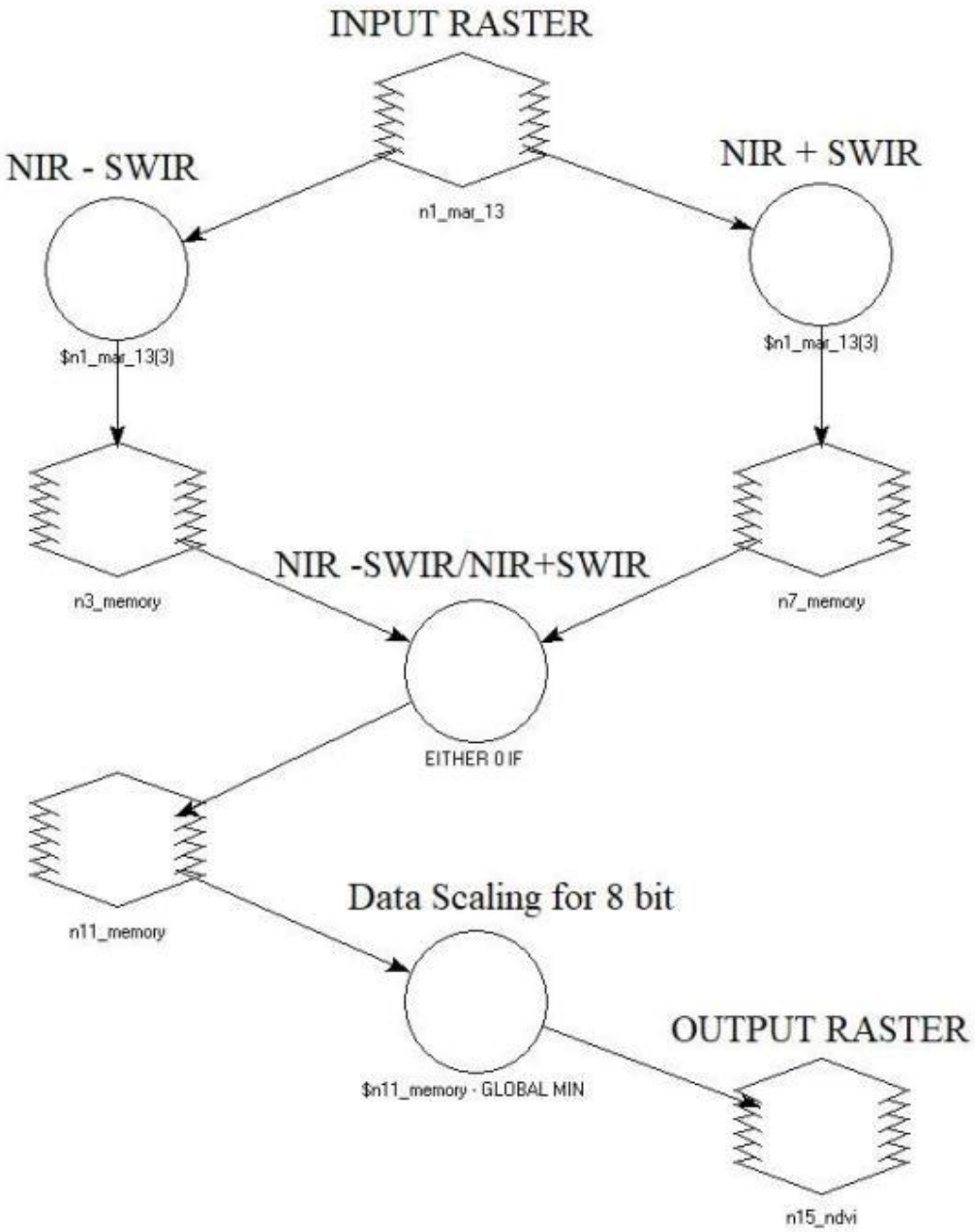
Source: Moisture Density Kharif season Computed as per satellite Imagery LISSIV(Post project Status)

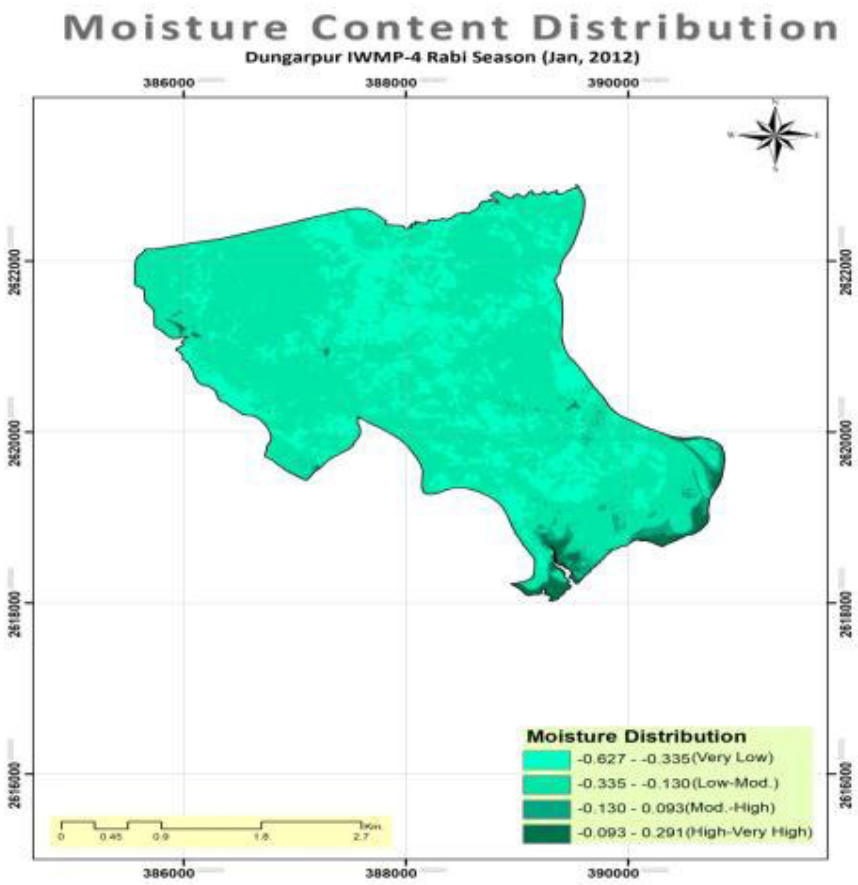
Difference of area (increasing /decreasing) in Hectare			Table: 8.29
Soil Moisture	**Area Pre (%)**	**Area Post (%)**	**Difference**
1	**2**	**3**	**4**
Low - Nil	309.83	439.31	129.480
Mod. - Low	895.71	754.10	-141.608
High - Mod.	32.89	23.69	-9.206
Very High	24.52	45.86	21.334

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

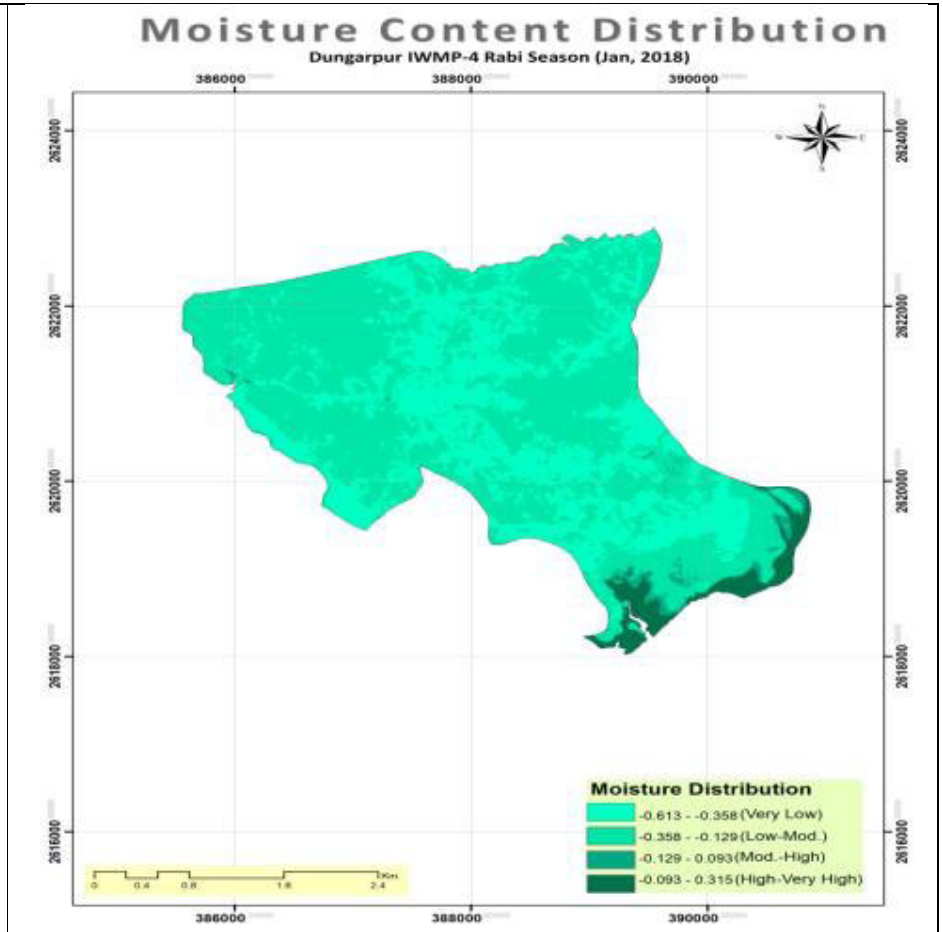


Normalized Difference Water Index

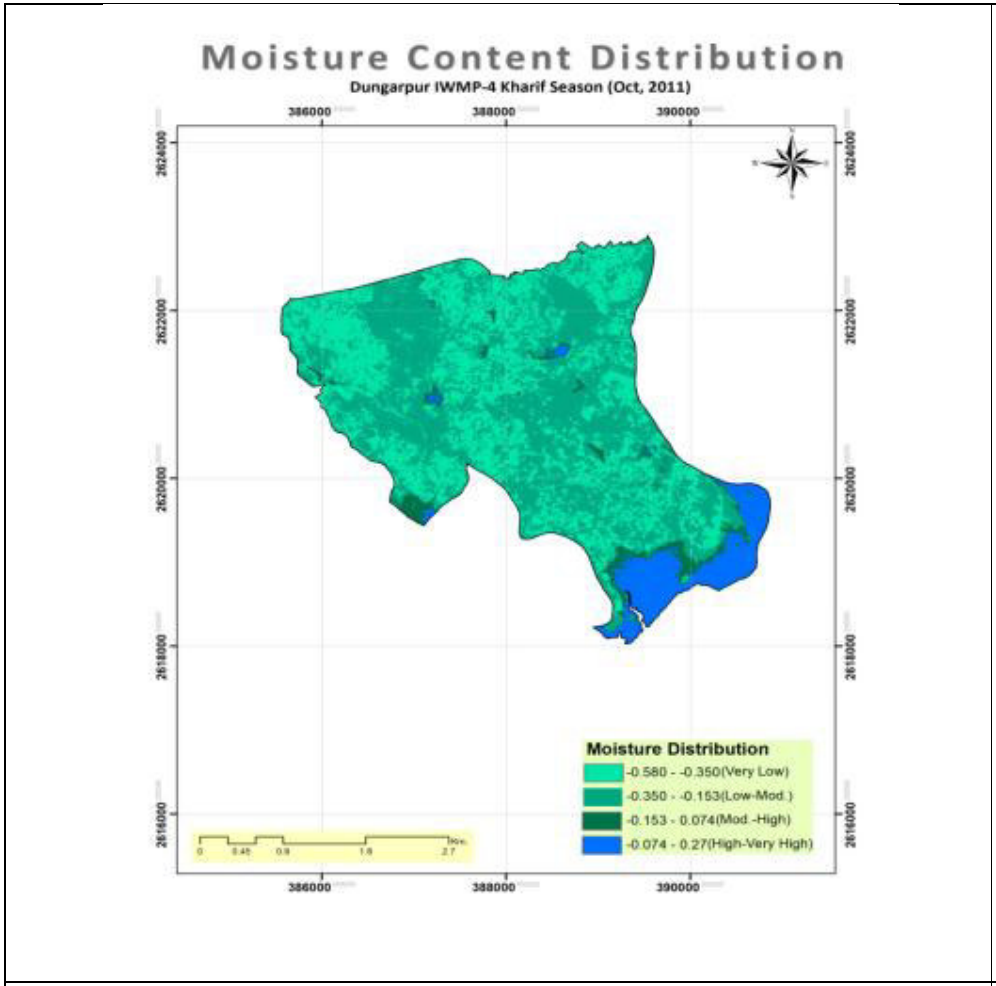




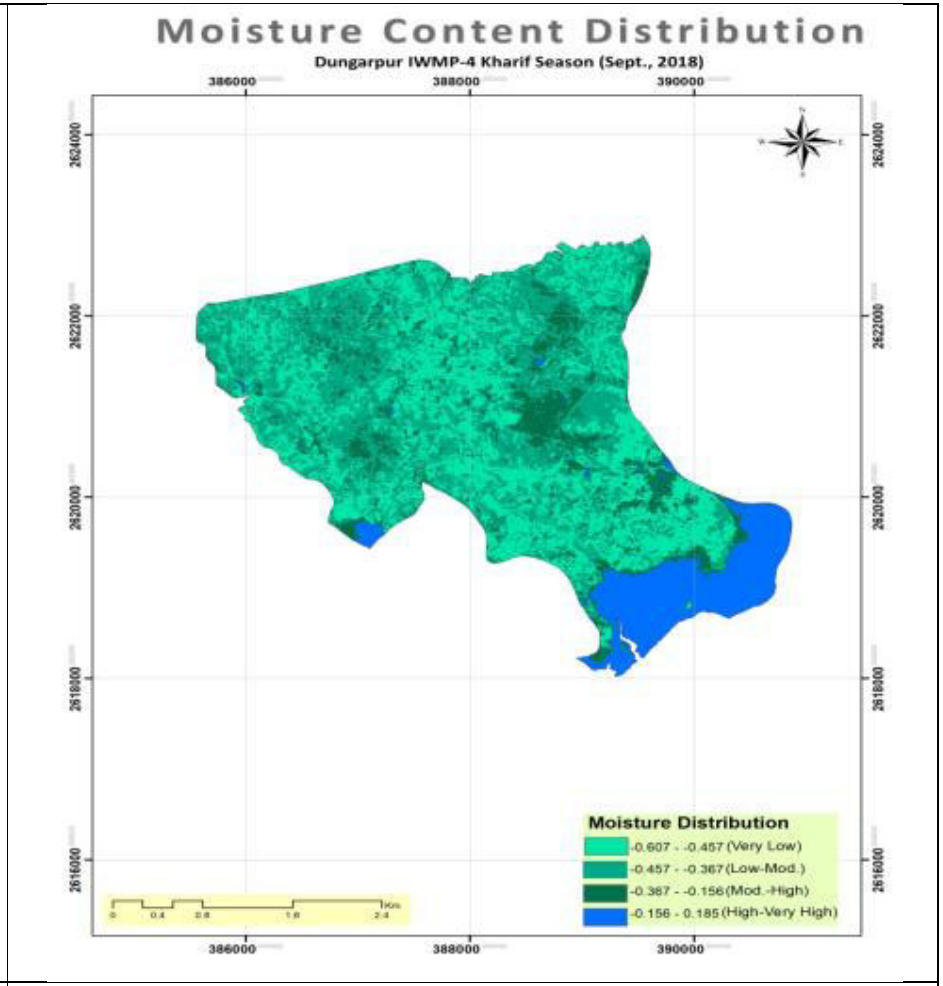
Moisture Density using NDWI in study area Rabi Season (Pre Project Status- Jan 2012) computed LISS IV Imagery



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



Moisture Density using NDWI in study area Kharif Season(Pre Project Status – Oct. 2011) computed LISS IV Imagery



Moisture Density using NDWI in study area Kharif Season(Post Project Status – Sept 2018) computed LISS IV Imagery

CHAPTER –9
Watershed Development Fund (WDF)

9.1WDF at a Glance in IWMP-4/2010-11 project, Dungarpur:

Watershed Development Fund in IWMP 4/2010-11:

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. 2.32 Lacs Concerning Gram Panchayat**
4.	Monitoring of Revolving fund by and total amount under circulation / available (Rs.)	**4.75Lacs**

Source: PIA and survey by MEL&D agency

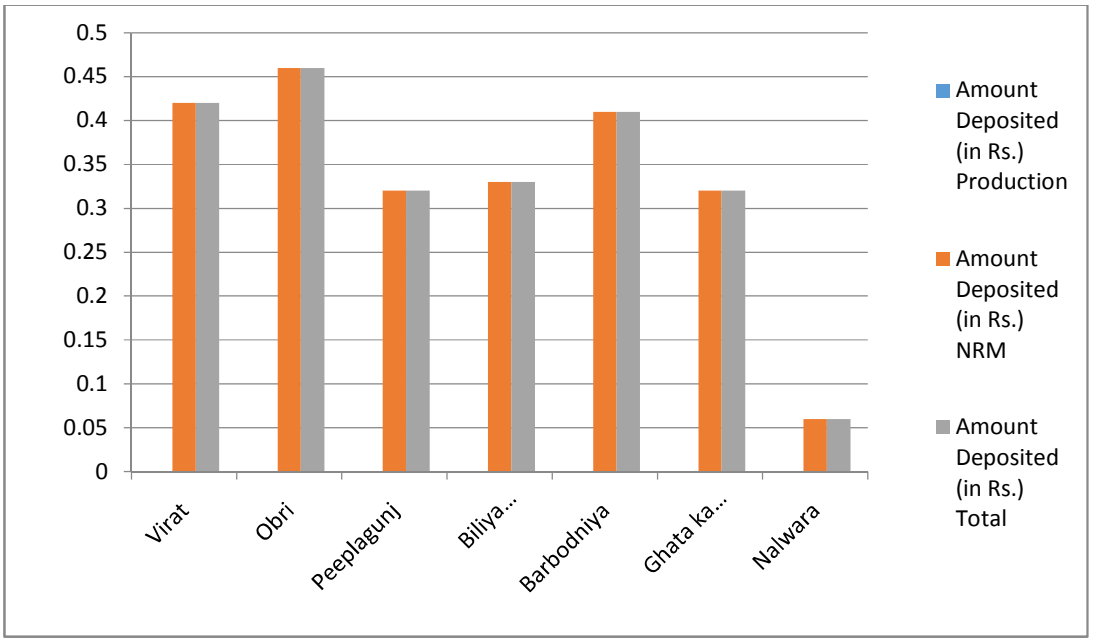
9.2 Details of Amount Deposited in WDF in IWMP 4/2010-11 project:

Details of Amount Deposited in WDF in IWMP 4/2010-11

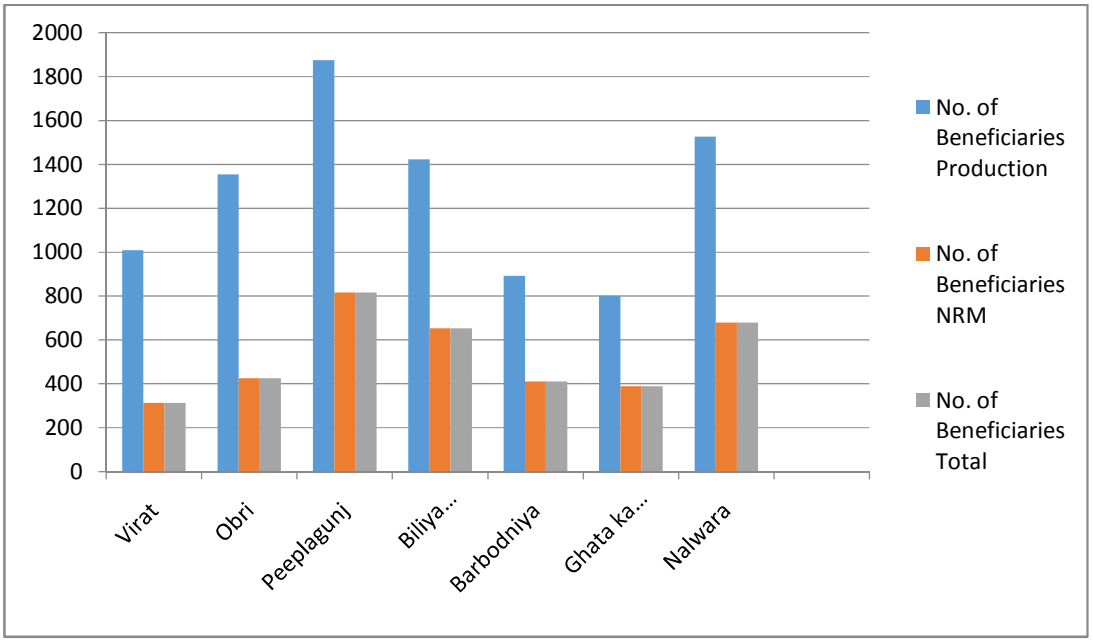
Table:9.2

S.No.	Name of Watershed Committee	Name of Bank	Account No.	Amount Deposited (in Rs.)			No. of Beneficiaries		
				Pro-duction	NRM	Total	Pro-duction	NRM	Total
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	Virat	BRGB SAGWARA	01/8839	0	0.42	0.42	1009	312	312
2	Obri	BRGB SAGWARA	01/8781	0	0.46	0.46	1355	425	425
3	Peeplagunj	BRGB SAGWARA	01/8844	0	0.32	0.32	1875	815	815
4	BiliyaBadgama	BRGB SAGWARA	01/8808	0	0.33	0.33	1423	652	652
5	Barbodniya	BRGB SAGWARA	01/8797	0	0.41	0.41	893	411	411
6	GhatakaGanv	BRGB SAGWARA	01/8779	0	0.32	0.32	802	389	389
7	Nalwara	BRGB SAGWARA	01/8780	0	0.06	0.06	1526	678	678
Total				**0**	**2.32**	**2.32**	**8883**	**3682**	**12565**

Source: PIA and survey by MEL&D agency



Details of Watershed Committee-wise Amount Deposited in WDF in Dungarpur, IWMP-4/2010-11



Details of Watershed Committee-wise no. of beneficiaries in Dungarpur IWMP-4/2010-11

It is observed that a sum of **Rs 0.00**is collected as Farmer's contribution out of Production activities and **Rs. 2.32Lacs** out of NRM activities, thus total **Rs. 2.32Lacs** is available in the WDF. Further, it is also reported that **8883 Nos.** of beneficiaries have contributed in Production System and **3682** Nos. in NRM works, thus total beneficiaries contributed in WDF is **12565**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 inDUNGARPUR IWMP-4/2010-11, 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 SHGs (18 to 37 No.) is increased by **105.56**% with an increase of**120%** number of members (180 to 396 No.) and no. of UGs (8 to 45 No.) is increased by **462.50%** with an increase of**231.25%** number of members (00 to 265 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 SHGs (10 to 16 No.) is increased by **60**% with an increase of**55%** number of members (100 to 155 No.) and no. of UGs (3 to 5No.) is increased by **66.67%** with an increase of**50%** no. of members (30 to 45 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–4 /2010-11	Base line	18	180	8	80
	End line	37	396	45	265
	Impact /change (No.)	**19**	**216**	**37**	**185**
	Impact/change (%)	**105.56**	**120.00**	**462.50**	**231.25**
Control area	Base line	10	100	3	30
	End line	16	155	5	45
	Impact /change (No.)	**6**	**55**	**2**	**15**
	Impact/change (%)	**60.00**	**55.00**	**66.67**	**50.00**

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 **0.15%** and Below Poverty Line (BPL) population is decreased by **0.15%**. As regards to farmer types-wise description, **less than 1.02%**changes is noticed from Large category to Marginal and Medium category that might be due to fragmentation of land holdings over the years.

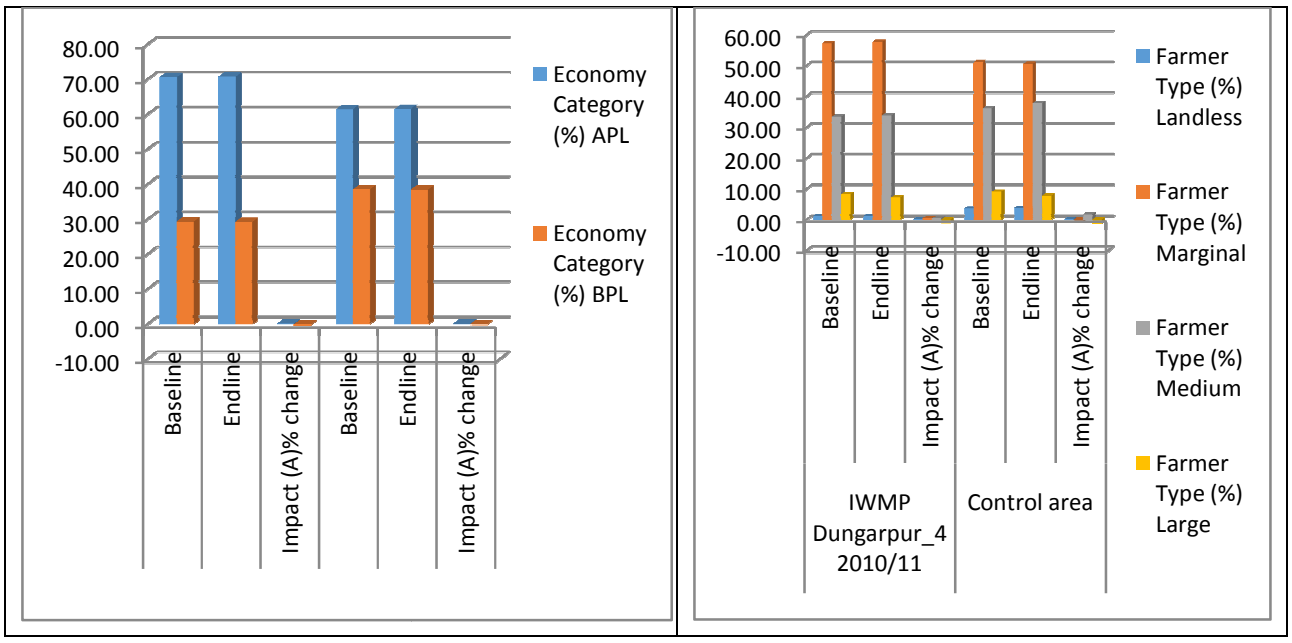
In Control area, at the final impact evaluation stage, Above Poverty Line (APL) population increased by **0.10%** and Below Poverty Line (BPL) population is deceased by **0.10%**. As regards to farmer types-wise description, again **less than 1.26%** change is noticed from Large category to Marginal 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–4 /2010-11	Baseline	70.63	29.37	1.11	57.21	33.44	8.24
	End line	70.78	29.22	1.21	57.72	33.85	7.22
	Impact change	**0.15**	**-0.15**	**0.10**	**0.51**	**0.41**	**-1.02**
Control area	Baseline	61.43	38.57	3.61	51.22	36.12	9.05
	Endline	61.53	38.47	3.78	50.58	37.85	7.79
	Impact change	**0.10**	**-0.10**	**0.17**	**-0.64**	**1.73**	**-1.26**

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 **29.48%** (from 2249 to 2912Nos) in Cows, an increase of **28.54%** (from 3108 to 3995 Nos.) in Buffaloes, an increase of **10.72%** (from 4116to 4557 Nos.) in Goats. The **average milk production** in Kg. per day was observed as an increase of **2.00%** (from 6.25to 8.25 Kg./Day) in Cows, an increase of **2.00%** (from 8.5to 10.50 Kg./Day) in Buffaloes, an increase of **1.00%** (from 2to 3.00Kg/Day) in Goats.

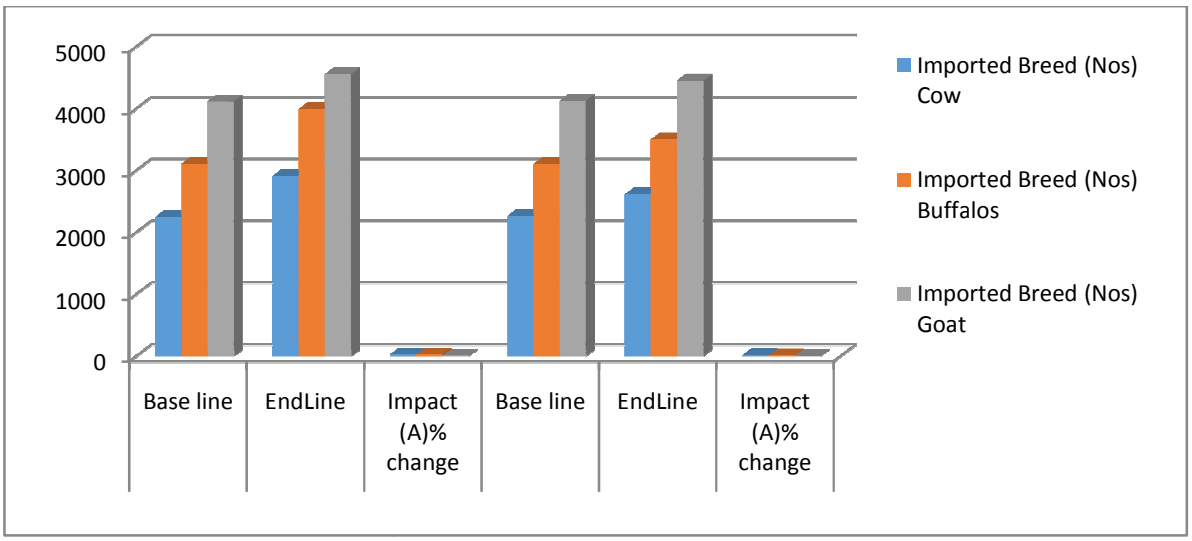
In control area, at the final impact evaluation stage, the livestock detail including milk productivity and self-sufficiency was monitored. It was observed that **improved breeds;** an increase of **15.35%** (from 2267 to 2615Nos) in Cows, an increase of **12.85%** (from 3103 to 3502 Nos.) in Buffaloes, an increase of **7.95%** (from 4126 to 4454 Nos.) in Goats. The **average milk production** in Kg. per day was observed as an increase of **1.50%** (from 5.25to 6.75 Kg./Day) in Cows, an increase of **1.00%** (from 7.5to 8.50 Kg./Day) in Buffaloes, an increase of **0.50%** (from 2 to 2.50 Kg/Day) in Goats.

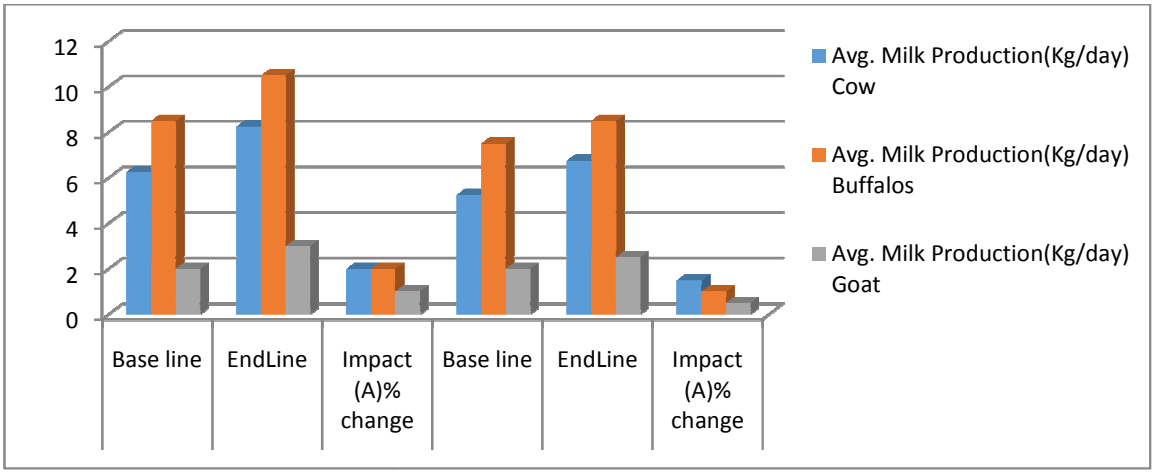
Livestock details in IWMP Watershed and Control Area (unit/%):

Table: 10.3

IWMP/ Control Area	Time line	Imported Breed (Nos)			Avg. Milk Production(Kg/day)		
		Cow	Buffalos	Goat	Cow	Buffalos	Goat
1	2	3	4	5	6	7	8
IWMP–4 /2010-11	Base line	2249	3108	4116	6.25	8.5	2
	End line	2912	3995	4557	8.25	10.50	3.00
	Impact / Change (%)	**29.48**	**28.54**	**10.72**	**2.00**	**2.00**	**1.00**
Control area	Base line	2267	3103	4126	5.25	7.5	2
	End line	2615	3502	4454	6.75	8.50	2.50
	Impact / Change (%)	**15.35**	**12.85**	**7.95**	**1.50**	**1.00**	**0.50**

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 **3.07%**in Government Supply, increase of **2.11%** in private supply, decrease of **1.83%** in hand pumps, decrease of **1.27%** in tanker supply.

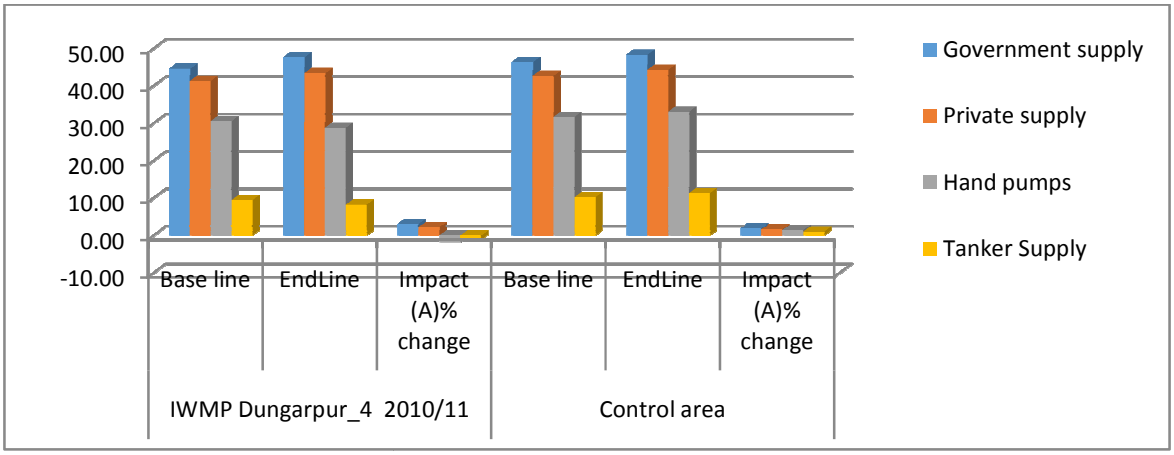
In control area, at the final impact evaluation stage, the changes in drinking water facilities were monitored. It was observed that there is an increase of **1.9%**in Government Supply, increase of **1.44%** in private supply, increase of **1.02%** in hand pumps, increase of **1.61%** in tanker supply.

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–4 /2010-11	Base line	44.58	41.28	30.58	9.48
	End line	47.65	43.39	28.75	8.21
	Impact / change	**3.07**	**2.11**	**-1.83**	**-1.27**
Control area	Base line	46.42	42.68	31.68	10.25
	End line	48.32	44.29	33.12	11.27
	Impact / change	**1.9**	**1.61**	**1.44**	**1.02**

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 Dungarpur IWMP -4/2010-11watersheds is done on field bunds on farmers' fields, Anicuts, CCT, DCCT, MPT, SGT Earthen Check Dams and PakkaChekdam. Field bund**reduces water runoff and controls soil erosion.** Total capacity of rain water harvesting of all NRM activities (soil & Water Conservation measures) in the IWMP watershed is **551Thousands CUM.**With the implementation of such watershed activities, total **659** 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 as well as inEnd 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 as End line survey**, Flora & Fauna** were found during Baseline as well as End line survey and no **Wild Life sanctuary, Cultural Heritage and Archaeological Site** were found at both the stages.

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–4 /2010-11	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

10.3.3 Bio-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,Medicinal Plants, Rejuvenation of local spices of trees** were found available during Base line and End Line stages.

In control area, at the final impact evaluation stage, **Non-brows able tree species, Minor Plants, Fruit Plants,Medicinal Plants, Rejuvenation of local spices of trees** were found available during Base line and End Line stages.

Bio-diversity in IWMP Watershed and Control Area:

Table: 10.6

IWMP/ Control Area	Timeline	Bio-diversity				
		Non-brow sable tree species	Minor Plants	Fruit Plants	Medicinal Plants	Rejuvenation of local spices of trees
1	2	3	4	5	6	7
IWMP–4 /2010-11	Base line	Y	Y	Y	Y	Y
	End line	Y	Y	Y	Y	Y
	Impact / change	**0**	**0**	**0**	**0**	**0**
Control area	Base line	Y	Y	Y	Y	Y
	End line	Y	Y	Y	Y	Y
	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 **8.01%**. The **average water level** in meters was reported to be decreased by **1.91%** in June, **2.11%** in October and**1.99%** in January.

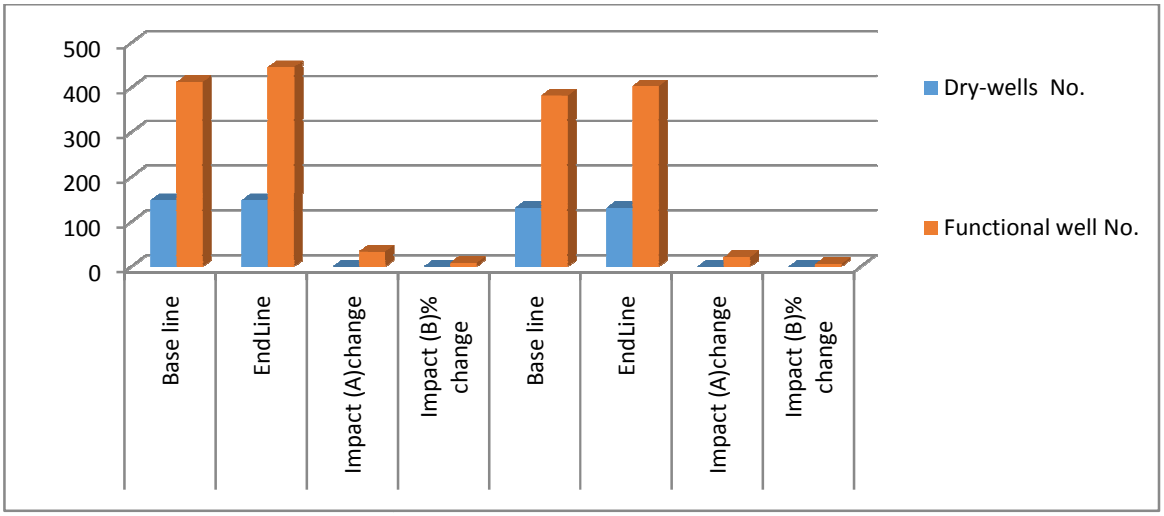
In control area, at the final impact evaluation stage, the sources of ground water and level were monitored. The **dry wells**numbers were not change**,functional wells** were increased by **5.50/%.** The **average water level** in meters was reported to be increased by **0.93%** in June, **0.67%** in October and**1.11**in January. The impact of intervention is visible as the water levels are decreased in IWMP area.

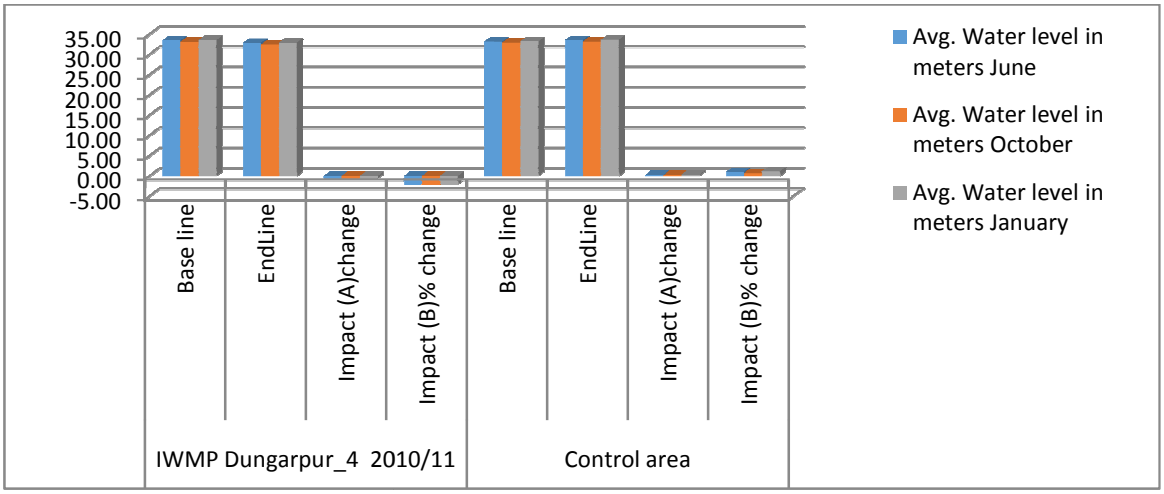
Ground water sourceand Avg. Water level (bgl) in IWMP Watershed and Control Area (%):

Table: 10.7

IWMP/ Control Area	Timeline	Dry wells	Functional well	Avg. Water level (bgl) in meters		
		No.	No.	June	October	January
1	2	3	4	8	9	10
IWMP–4 /2010-11	Base line	148	412	33.51	33.15	33.59
	End line	148	445	32.87	32.45	32.92
	Impact Unit change	**0**	**33**	**-0.64**	**-0.70**	**-0.67**
	Impact / % change	**0.00**	**8.01**	**-1.91**	**-2.11**	**-1.99**
Control area	Base line	**131**	**382**	33.19	32.96	33.25
	End line	131	403	33.50	33.18	33.62
	Impact Unit change	**0**	**21**	**0.31**	**0.22**	**0.37**
	Impact / %change	**0.00**	**5.50**	**0.93**	**0.67**	**1.11**

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 **63.36%** (from 1194ha to 1950 ha) in Kharif, increased by **54.80%** (from 824 ha to 1275 ha) in Rabi, increased by **18.75%** (from 80 ha to 95ha) in Jayad, the **Total Irrigated Area** is increased by **73.59%** (from 568 ha to 986 ha) in Kharif, increased by **61.78%** (from 785 ha to 1270 ha) in Rabi, increased by **18.75%** (from 80 ha to 95 ha)in Jayad. The **Total Cropped Area**for single crop is increased by **82.42**% (from 370 Ha to 675 Ha) while for double crop it is increased by **51.61%** (from 904 ha to 1370 ha), and for multiple crop, it is increased by **19.05%** (from 105 ha to 125 ha).

In control area, at the final impact evaluation stage, the **Total Cultivated Land** is increased by **5.35%** (from 1253 ha to 1320 ha) in Kharif, increased by **4.62%** (from 865 ha to 905 ha) in Rabi, increased by **4.76%** (from 84 ha to88 ha) in Jayad, the **Total Irrigated Area** is increased by **5.70%** (from 596ha to 630 ha) in Kharif, increased by **5.09%** (from 825 ha to 867 ha) in

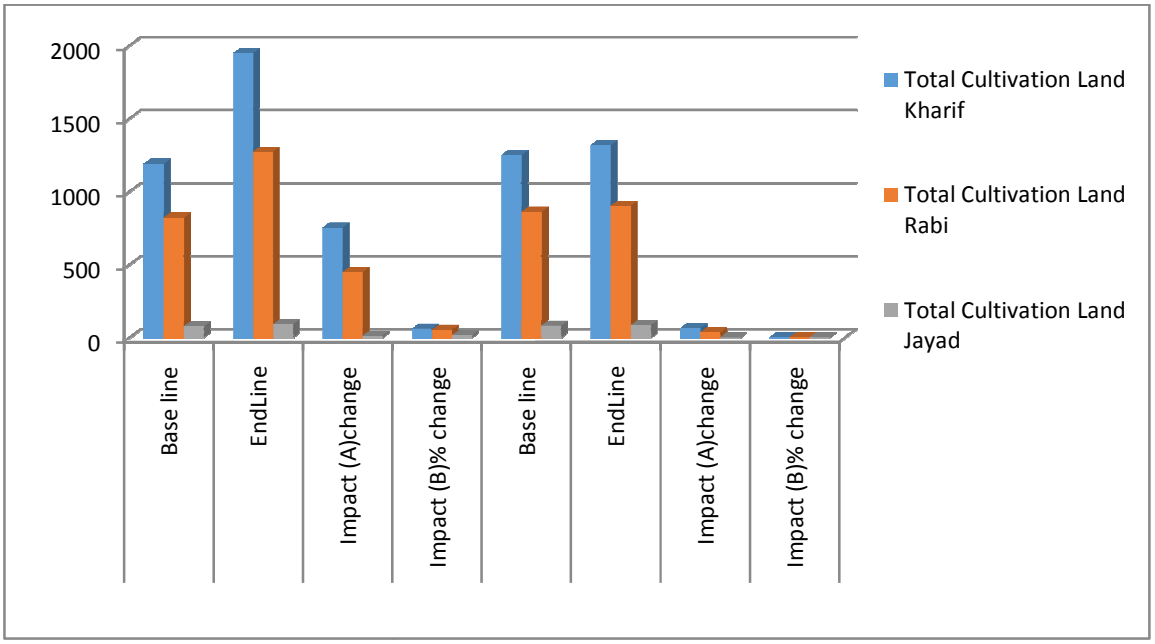
Rabi, increased by **41.25%** (from 80 ha to 113 ha)in Jayad, the **Total Cropped Area**for single crop is increased by **6.96%** (from 388ha to 415 ha) while for double crop it is increased by **4.64%** (from 949 ha to 993 ha), and for multiple crop, it is increased by **4.76%** (from 84 ha to88 ha) in Jayad.

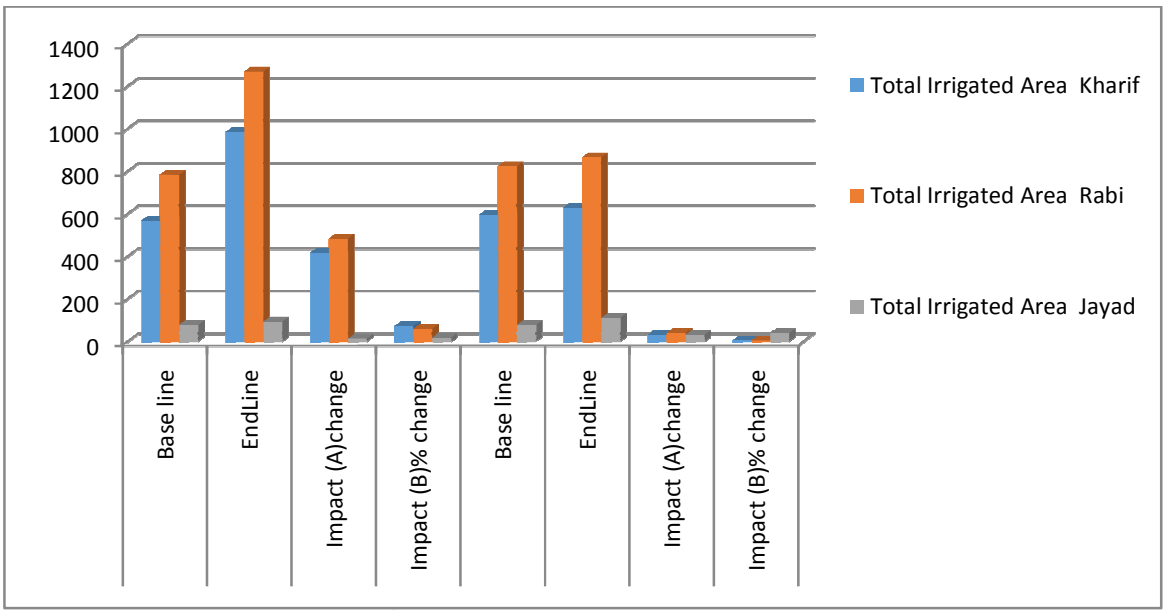
Cropping Pattern - Total Cultivation Land, Irrigated Area & Cropped area in IWMP Watershed and Control Area (ha/%):

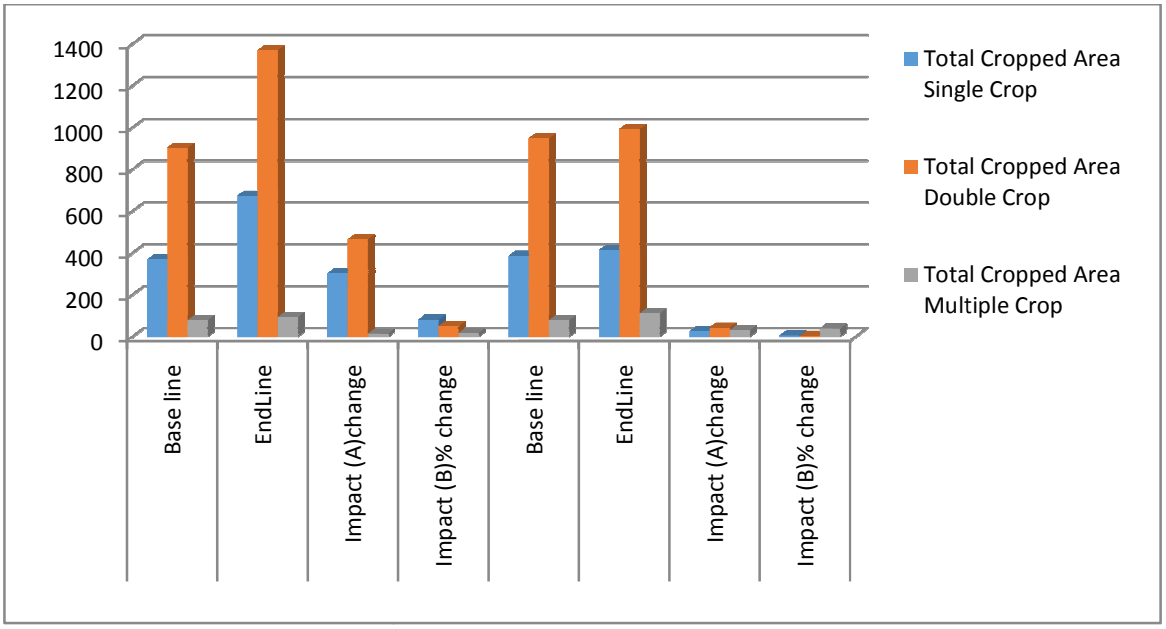
Table: 10.8

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–4/2010-11	Base line	1194	824	80	568	785	80	370	904	80
	End line	1950	1275	95	986	1270	95	675	1370	95
	Impact / change (ha)	**756**	**451**	**15**	**418**	**485**	**15**	**305**	**466**	**15**
	Impact / % change	**63.36**	**54.80**	**18.75**	**73.59**	**61.78**	**18.75**	**82.42**	**51.61**	**18.75**
Control area	Base line	1253	865	84	596	825	80	388	949	84
	End line	1320	905	88	630	867	113	415	993	88
	Impact / change (ha)	**67**	**40**	**4**	**34**	**42**	**33**	**27**	**44**	**4**
	Impact / % change	**5.35**	**4.62**	**4.76**	**5.70**	**5.09**	**41.25**	**6.96**	**4.64**	**4.76**

Source: Survey results of MEL&D agency Arpan







10.4.2Season-wise & Crop-wise area in IWMP Watershed &Control Area (ha/%):

In watershed project area, at the final impact evaluation stage, the **Season-wise & Crop-wiseareain Kharif,**is increased by **68.9%** (from 811 ha to 1370 ha) for Maize, increased by **51.6%** (from 383ha to 580 ha) for others, increased by **63.4%** (from 1194 ha to 1950 ha) as total, **in Rabi,** increased by **50.9%** (from 452 ha to 682 ha) for Mustard, increased by **61.7%** (from 201ha to 325ha) for Wheat, increased by **57.1%** (from 171 ha to 268 ha) for others & increased by **54.8%** (from 824 ha to 1275 ha) as total, in Jayad,area increased by **18.8%** (from 80 ha- 95 ha).

In control area, at the final impact evaluation stage, the **Season-wise and Crop-wise area in`Kharif,** is **4.8**% increased (from 835 ha to 875 ha) for Maize, increased by **6.5%** (from 418 ha to445 ha) for others, increased by **5.3%** (from 1253 ha to 1320 ha) as total, **in Rabi,** is

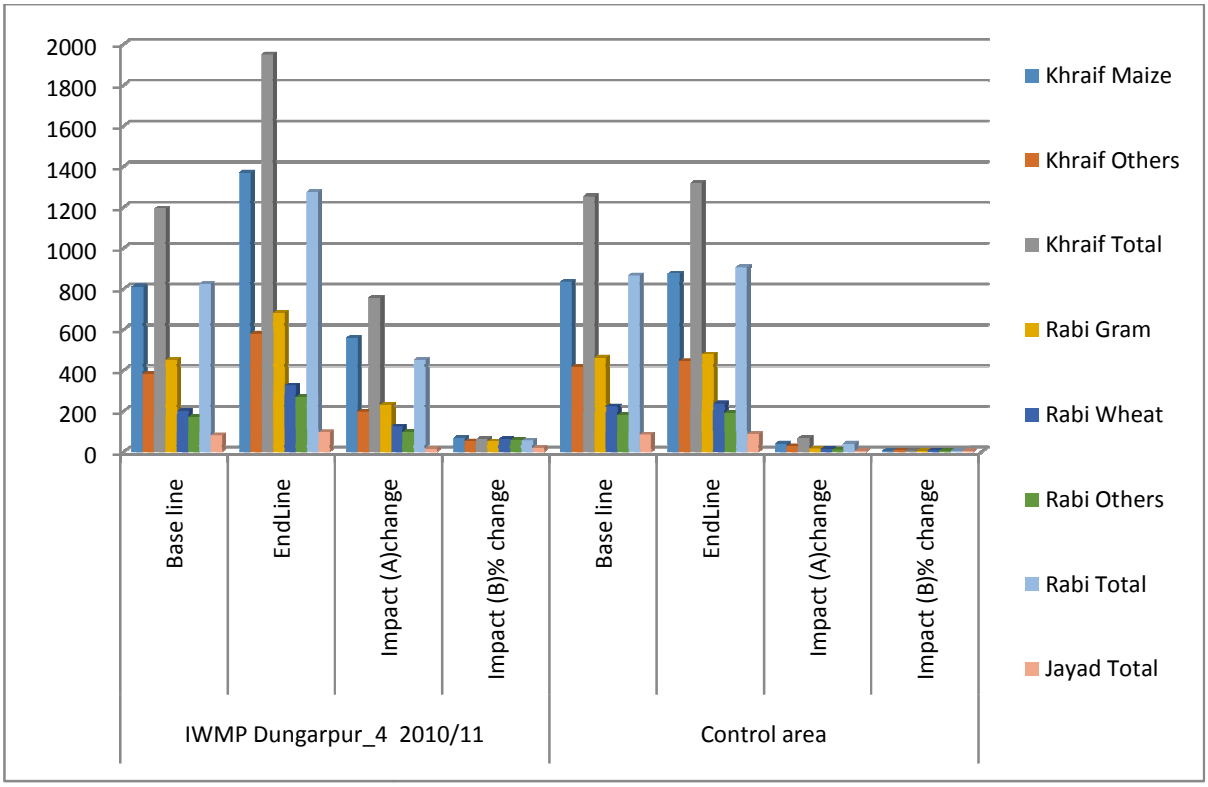
increased by **3.5%** (from 462 ha to 478 ha) for Mustard, increased by **6.3%** (from 223 ha to 237 ha) for Wheat, increased by **5.6%** (from180 ha to 190 ha) for others and increased by **4.6%** (from 865ha to 905 ha) as total, **in Jayad,**area increased by **4.8%** (from 84 ha to 88 ha) .

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

Table: 10.9

IWMP/ Control Area	Timeline	Kharif			Rabi				Jayad
		Maize	Others	Total	Mustard	Wheat	Others	Total	Total
1	2	3	4	5	6	7	8	9	10
IWMP–4/2010-11	Base line	811	383	1194	452	201	171	824	80
	End line	1370	580	1950	682	325	268	1275	95
	Impact / change (ha)	**559**	**197**	**756**	**230**	**124**	**97**	**451**	**15**
	Impact / % change	**68.9**	**51.6**	**63.4**	**50.9**	**61.7**	**57.1**	**54.8**	**18.8**
Control area	Base line	835	418	1253	462	223	180	865	84
	End line	875	445	1320	478	237	190	905	88
	Impact / change (ha)	**40**	**27**	**67**	**16**	**14**	**10**	**40**	**4**
	Impact / % change	**4.8**	**6.5**	**5.3**	**3.5**	**6.3**	**5.6**	**4.6**	**4.8**

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**15.28%**on use of certified seeds, increase of **12.25%** on use of hybrid seeds, increase of **18.00%** on use of culture, decrease of **8.25%** on use of pesticides, decrease of **5.65%** on use of insecticides, decrease of **3.75%** on use of fertilizers, **no change** on use of manures, increase **9.65%** on use of vermi compost, increase of **6.30%** on use of compost.

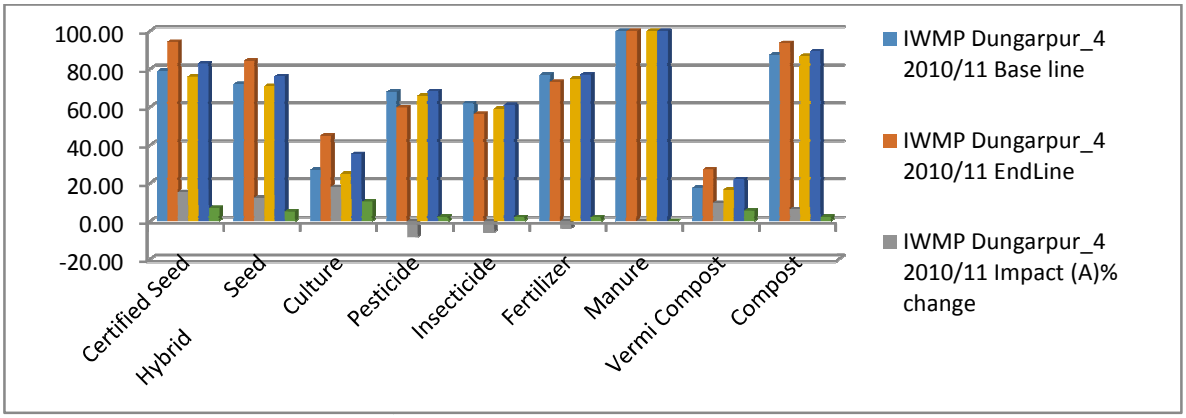
In control area, at the final impact evaluation stage, the impact on percentage households on adoption of new packages of practices is found as increase of **7.00%** on use of certified seeds, increase of **5.15%** on use of hybrid seeds, increase of **10.24%** on use of culture, increase of **2.38%** on use of pesticides, increase of**2.10%** on use of insecticides, increase of **2.12%** on use of fertilizers, **no change** on use of manures, increase of **5.59%** on use of vermi compost, increase of **2.41%** on use of compost.

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

Table: 10.10

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–4 /2010-11	**Base line**	79.00	72.00	27.00	68.00	62.00	77.00	100.00	17.55	87.45
	EndLine	94.28	84.25	45.00	59.75	56.35	73.25	100.00	27.20	93.75
	Impact (A)% change	**15.28**	**12.25**	**18.00**	**-8.25**	**-5.65**	**-3.75**	**0.00**	**9.65**	**6.30**
Control area	**Base line**	76.00	71.00	25.00	66.00	59.00	75.00	100.00	16.56	86.86
	EndLine	83.00	76.15	35.24	68.38	61.10	77.12	100.00	22.15	89.27
	Impact (A)% change	**7.00**	**5.15**	**10.24**	**2.38**	**2.10**	**2.12**	**0.00**	**5.59**	**2.41**

Source: Survey by MEL&D agency



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

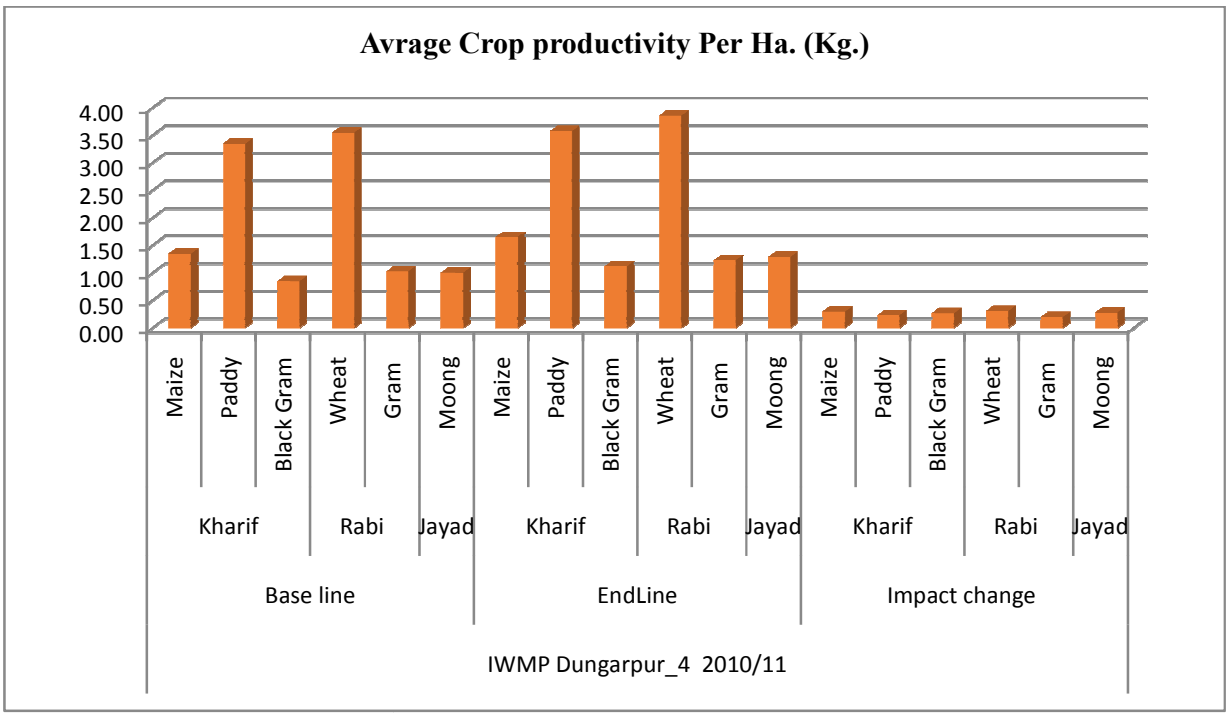
In watershed project area, at the final impact evaluation stage, the impact on a) **Crop-wise Average Crop Yield / Productivity and b)** is described in table given below.

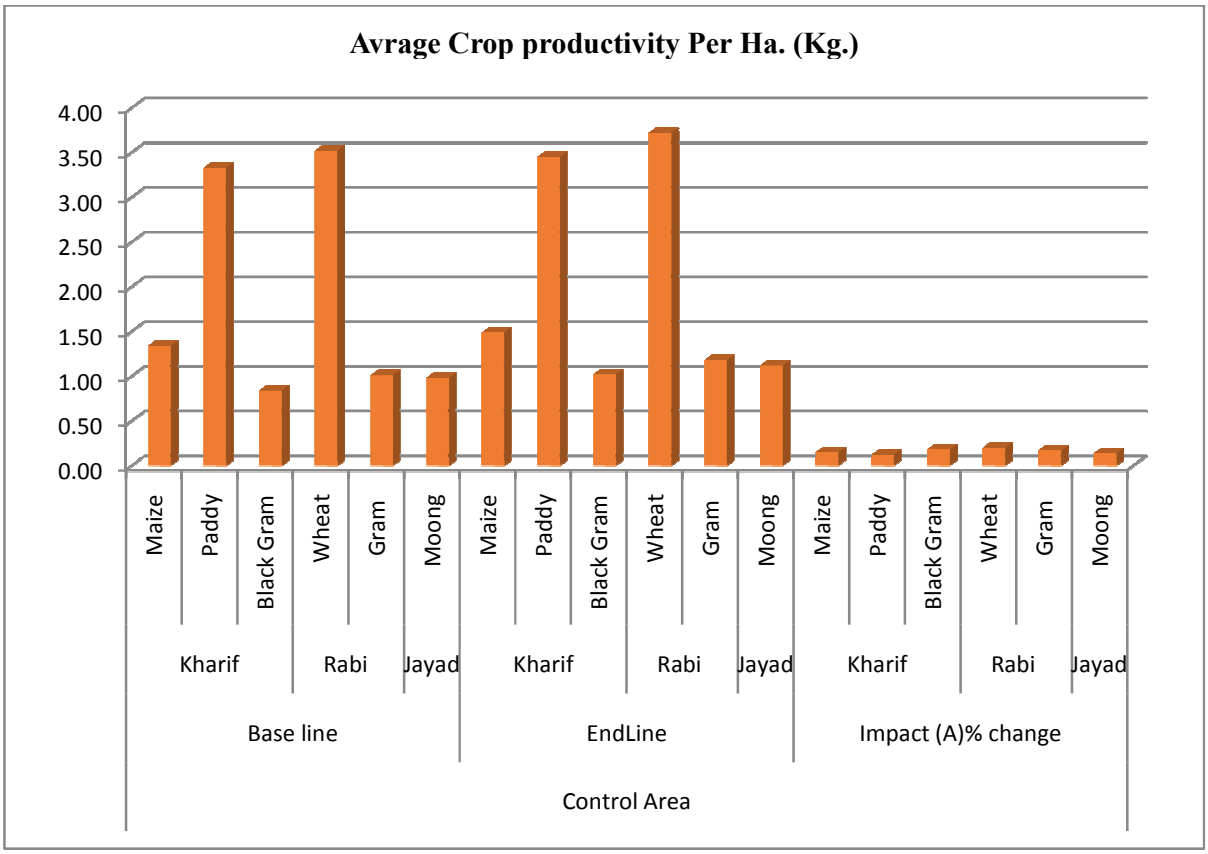
Average Crop Yield / Productivity in IWMP Watershed & Control Area (unit/%):

Table: 10.11

IWMP/ Control Area	Timeline	Season	Crop Type	Average Crop productivity Per Ha. (Kg.)
IWMP 4/ 2010/11	**Base line**	Kharif	Maize	1.35
			Paddy	3.35
			Black Gram	0.85
		Rabi	Wheat	3.55
			Gram	1.03
		Jayad	Moong	1.01
	EndLine	Kharif	Maize	1.65
			Paddy	3.58
			Black Gram	1.12
		Rabi	Wheat	3.86
			Gram	1.23
		Jayad	Moong	1.29
	Impact change	Kharif	Maize	**0.30**
			Paddy	**0.23**
			Black Gram	**0.27**
		Rabi	Wheat	**0.31**
			Gram	**0.20**
		Jayad	Moong	**0.28**
Control Area	**Base line**	Kharif	Maize	1.34
			Paddy	3.33
			Black Gram	0.84
		Rabi	Wheat	3.52
			Gram	1.01
		Jayad	Moong	0.98
	EndLine	Kharif	Maize	1.49
			Paddy	3.45
			Black Gram	1.02
		Rabi	Wheat	3.72
			Gram	1.18
		Jayad	Moong	1.12
	Impact (A)% change	Kharif	Maize	**0.15**
			Paddy	**0.12**
			Black Gram	**0.18**
		Rabi	Wheat	**0.20**
			Gram	**0.17**
		Jayad	Moong	**0.14**

Source: Survey by MEL&D agency


Avrage Crop productivity Per Ha. (Kg.)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Maize
Paddy
Black Gram
Wheat
Gram
Moong
Kharif
Rabi
Jayad
Base line
EndLine
Impact change
IWMP Dungarpur_4 2010/11


Avrage Crop productivity Per Ha. (Kg.)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Maize
Paddy
Black Gram
Wheat
Gram
Moong
Kharif
Rabi
Jayad
Base line
EndLine
Impact (A)% change
Control Area

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 **22.45%** (from Rs. 54690/- to 66968/-) per household, as wage employment, it is increased by **21.95%** (from 44770/- to 54997/-), as migration it is increased by **15.86%**(70220/- to 81957/-), in small enterprises, increased by **10.12%** (164000/- to 180597/-) and from services increased by **12.04%**(175500/- to 196630/-).

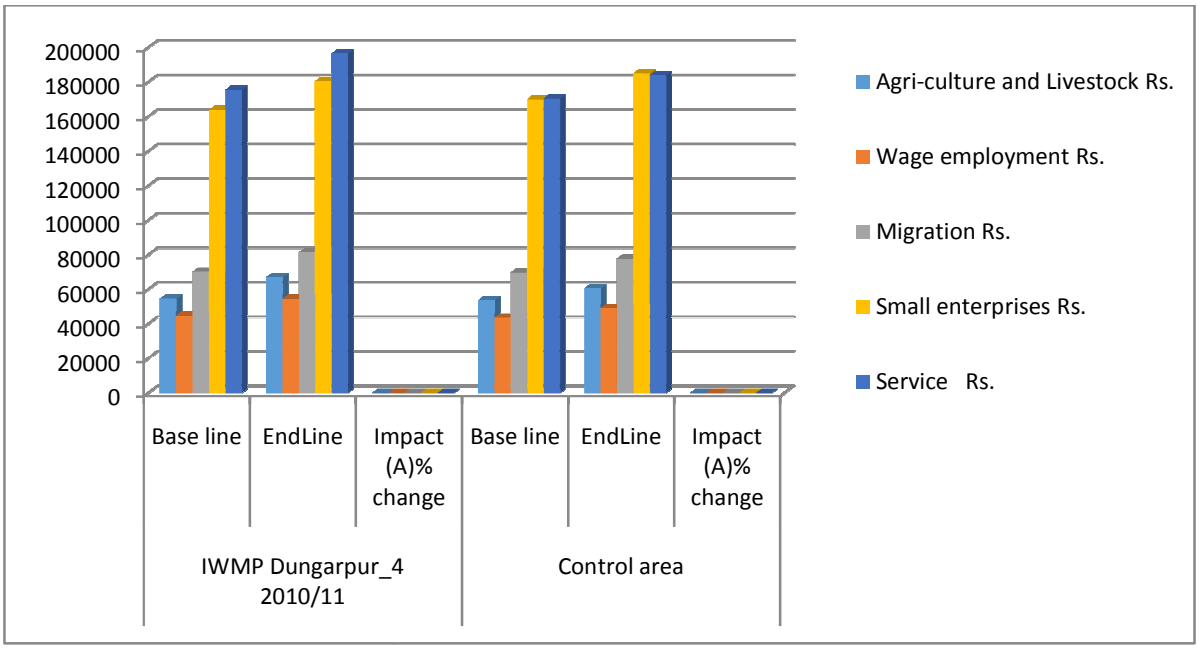
In control area, at the final impact evaluation stage, the average annual income in Agriculture and Livestock sector was increased by **12.49%** (from Rs. 53870/- to 60598/-) per household, as wage employment, it is increased by **12.80%** (from 43560/- to 49736/-), as migration it is increased by **11.68%**(69650/- to 77785/-), in small enterprises, increased by **8.84%** (170000/- to 185028/-) and from services increased by **7.94%**(170500/- to 184038/-).

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–4 /2010-11	Base line	54690	44770	70220	164000	175500
	End line	66968	54597	81357	180597	196630
	Impact / % change	**22.45**	**21.95**	**15.86**	**10.12**	**12.04**
Control area	Base line	53870	43560	69650	170000	170500
	End line	60598	49136	77785	185028	184038
	Impact / % change	**12.49**	**12.80**	**11.68**	**8.84**	**7.94**

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 **5.38%** (25000/- to 26345/-), on Cloths; an increase of **7.81%** (12200/- to 13153/-), on Education; an **increase 26.04%**(5600/- to 7058/), on Health, decreased by**5.76%** (1700/- to 1602/-), on Agriculture, an increase of **7.66%** (18000/- to 19379/-), on Household asserts, an increase of **14.42%**(1700/- to 1945/-), on Livestock; an increase of **10.74%** (19200/- to 21262/-), on Conveyance; an increase of **15.76%** (2200/- to 2547/-) and on others; an increase of **10.48%** (2200/- to 2431/-).

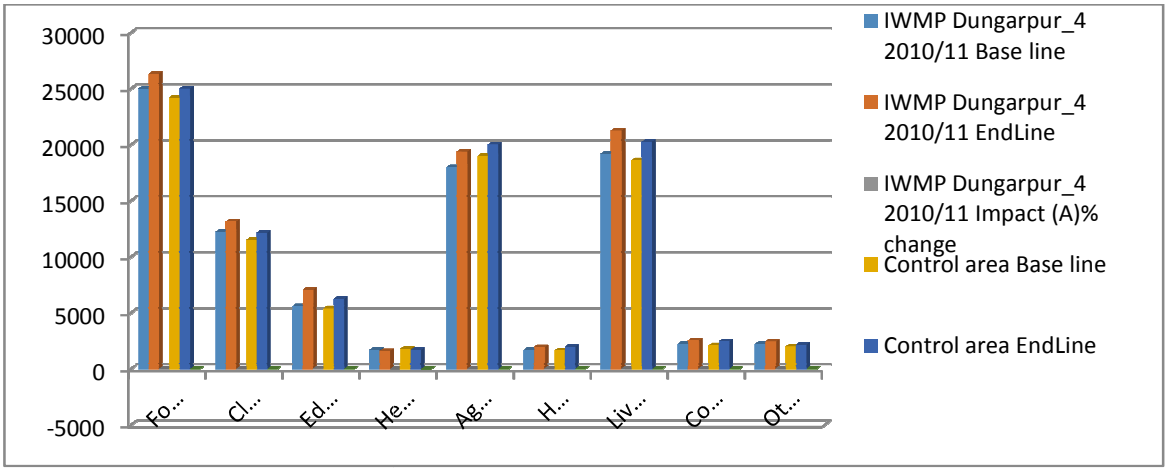
In control area, at the final impact evaluation stage, the average annual expenditure on different items was reported on Food; an increase of **3.35/%** (24200/- to 25011/-), on Cloths; an increase of **5.50%** (11500/- to 21233/-), on Education; an increase of **15.45%** (5400/- to 6234/), on Health, decrease of **6.07%** (1800/- to1691/-), on Agriculture, an increase of **5.29%** (19000/- to 20005/-), on Household asserts, an increase of **18.61%**(1650/- to 1957/-), on Livestock; an increase of **8.90%** (18600/- to 20255/-), on Conveyance; an increase of **17.30%** (2100/- to 2463/-) and on others; an increase of **7.45%** (2000/- to2149/-).

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–4 /2010-11	Base line	25000	12200	5600	1700	18000	1700	19200	2200	2200
	End line	26345	13153	7058	1602	19379	1945	21262	2547	2431
	Impact / % change	**5.38**	**7.81**	**26.04**	**-5.76**	**7.66**	**14.42**	**10.74**	**15.76**	**10.48**
Control area	Base line	24200	11500	5400	1800	19000	1650	18600	2100	2000
	End line	25011	12133	6234	1691	20005	1957	20255	2463	2149
	Impact / % change	**3.35**	**5.50**	**15.45**	**-6.07**	**5.29**	**18.61**	**8.90**	**17.30**	**7.45**

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 Seed as input are increased by **1.23%** (71.25% to 72.48%), Fertilizer as input are decreased by **0.90%**(11.52% to 10.62%), Manure as input is increased by **2.06%** households (5.69% to 7.75%), Pesticides as input decreased by **1.00%**(5.14% to 4.14%),Insecticides as input decreased by **1.39%**(6.40% to 5.01%). Market as source is decreased by **3.02%** households (44.25% to 41.23%), Cooperatives as source for the input increased by **2.47%**households (34.58% to 37.05%),Self-Produced as source for the input increased by **2.15%**households (12.85% to 15%) and Neighbourer as source for the input decreased by **1.60%** households (8.32% to 6.72%).

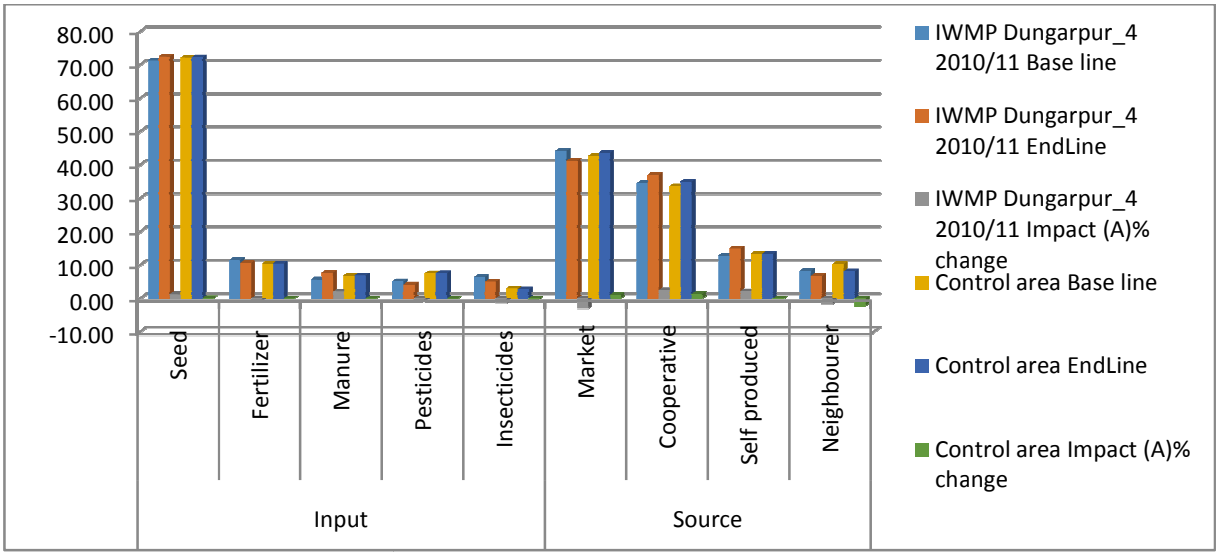
In control area, at the final impact evaluation stage, the percentage households taking Seed as input are increased by **0.14%** (71.25% to 72.28%), Fertilizer as input are increased by **0.07%**(10.41% to 10.48%), Market as input is increased by **0.06%** households (6.85% to 6.91%), Pesticides as input increased by **0.05%** (7.56% to 7.61%), Insecticides as input decreased by **0.32%**(3.04% to 2.72%). Market as source is increased by **1.02%** households (42.63% to 43.65%), Cooperatives as source for the input increased by **1.27%** households (33.63% to 34.90%), Self-Produced as source for the input decreased by **0.09%** households (13.41% to 13.32%) and Neighbourer as source for the input decreased by **2.20%** households (10.33% to 8.13%).

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

Table: 10.14

IWMP/ Control Area	Timeline	Input					Source			
		Seed	Fertilizer	Manure	Pesticides	Insecticides	Market	Cooperative	Self produced	Neighbourer
IWMP Dungarpur_4 2010/11	**Base line**	71.25	11.52	5.69	5.14	6.40	44.25	34.58	12.85	8.32
	EndLine	72.48	10.62	7.75	4.14	5.01	41.23	37.05	15	6.72
	Impact (A)% change	**1.23**	**-0.90**	**2.06**	**-1.00**	**-1.39**	**-3.02**	**2.47**	**2.15**	**-1.60**
Control area	**Base line**	72.14	10.41	6.85	7.56	3.04	42.63	33.63	13.41	10.33
	EndLine	72.28	10.48	6.91	7.61	2.72	43.65	34.90	13.32	8.13
	Impact (A)% change	**0.14**	**0.07**	**0.06**	**0.05**	**-0.32**	**1.02**	**1.27**	**-0.09**	**-2.20**

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 **7.53%**, as Wage employment, an increase of **6.34%,** as migration, a decrease of **2.67%,** as small enterprises, an increase of **0.31%,** as services, an increase of **0.15%.**

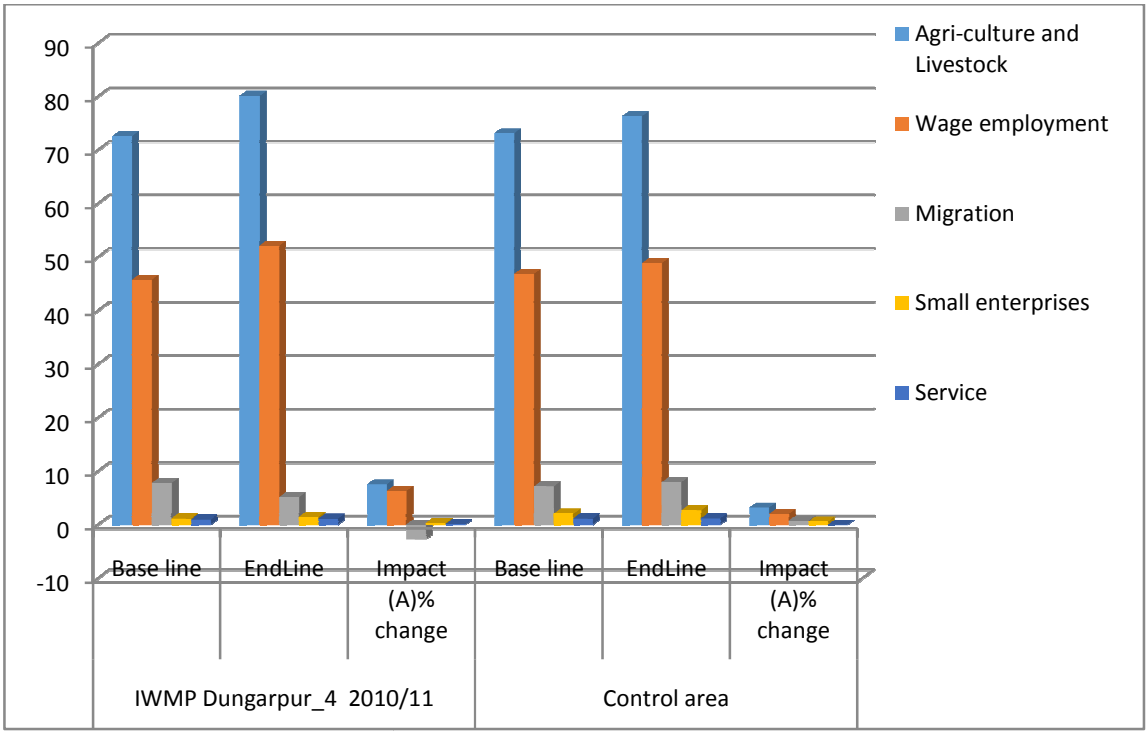
In control area, at the final impact evaluation stage, the employment opportunities for the percentage households under different sectors were monitored. It was observed that as Agriculture and Livestock, there is an increase of **3.18%**, as Wage employment, andecrease of **2.02%,** as migration, a increase of **0.78%,** as small enterprises, an increase of **0.61%,** as services, an increase of **0.02%.**

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–4 /2010-11	Base line	72.62	45.78	7.82	1.14	0.98
	End line	80.15	52.12	5.15	1.45	1.13
	Impact / change	**7.53**	**6.34**	**-2.67**	**0.31**	**0.15**
Control area	Base line	73.14	46.88	7.14	2.09	1.14
	End line	76.32	48.90	7.92	2.70	1.16
	Impact / change	**3.18**	**2.02**	**0.78**	**0.61**	**0.02**

Source: survey by MEL&D agency



10.5.6 Migration detailsin 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 **2.66%** households, as daily casual labour, decrease of**2.25%,** as Agriculture Labour decrease of **0.61%** and for business purposes, increase of **0.20%.**

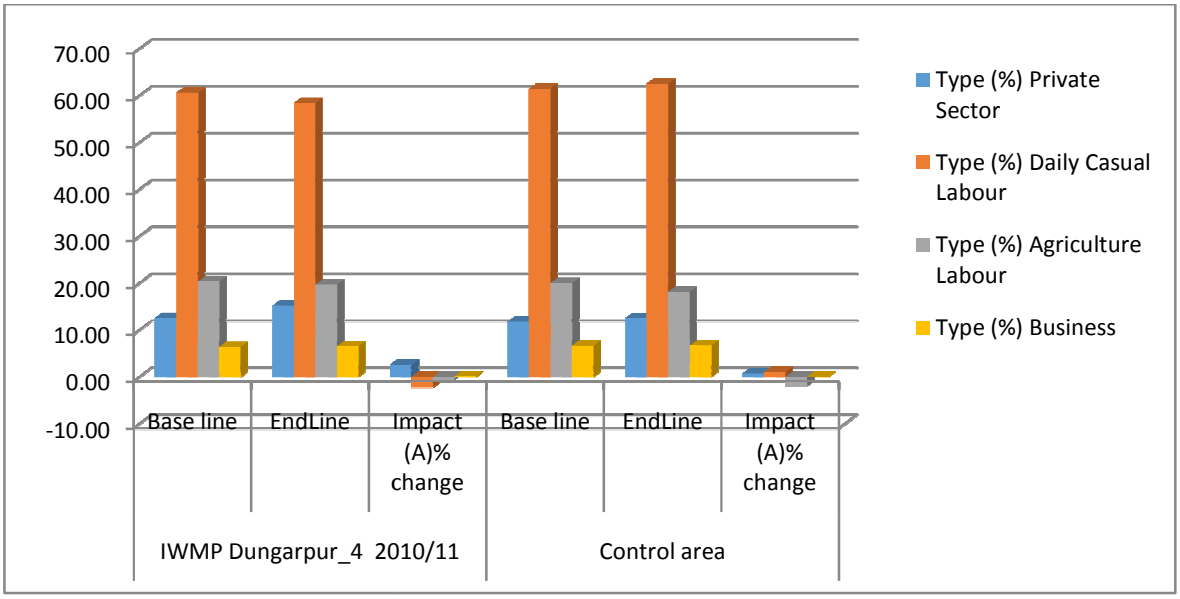
In control area, at the final impact evaluation stage, the migration of the communities for different purposes was monitored. It was found that for private sector employment, there is an increase of **0.76%** households, as daily casual labour, increase of**1.09%,** as Agriculture Labour, and decrease of **1.91%** and for business purposes, increase of **0.06%.**

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–4 /2010-11	Base line	12.59	60.65	20.36	6.40
	End line	15.25	58.40	19.75	6.60
	Impact / change	**2.66**	**-2.25**	**-0.61**	**0.20**
Control area	Base line	11.79	61.46	20.06	6.69
	End line	12.55	62.55	18.15	6.75
	Impact / change	**0.76**	**1.09**	**-1.91**	**0.06**

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 **7.53%** (from 72.62% to 80.15%) of total population, ii) Employment in Non- Agriculture Sector was increased by **6.34%** (from 45.78% to 52.12%) of total population, iii)Fuel wood Productionwas increased by **0.41 tons / hectare per year** (from 1.54to 1.95), iv) No. of Milch Cattle was increased by **663 Nos**. (from2249 to 2912 numbers) and increase in milk production by **2 liter per animal per day** (LPD) (from 6.25 LPD to 8.25 LPD), v) Duration of flow of water in the streams is increased **3 nos**. (from 3 nos. to 6nos), vi) No. of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship were increased by **7 nos.** (from 12 to 19Nos), vii) Reduction in migration from rural to urban area in the project area is reduced by **2.67%** (from 7.82% to 5.15%) of total population, viii) Annual Mean Household Income increased by **Rs. 12278/-** (from Rs. 54690/- to Rs. 66968/-) and ix) No. of children enrolled in schools in the project area**6.25%** (from 93.75% to 100%) of total child population.

Outcome of important indicators:

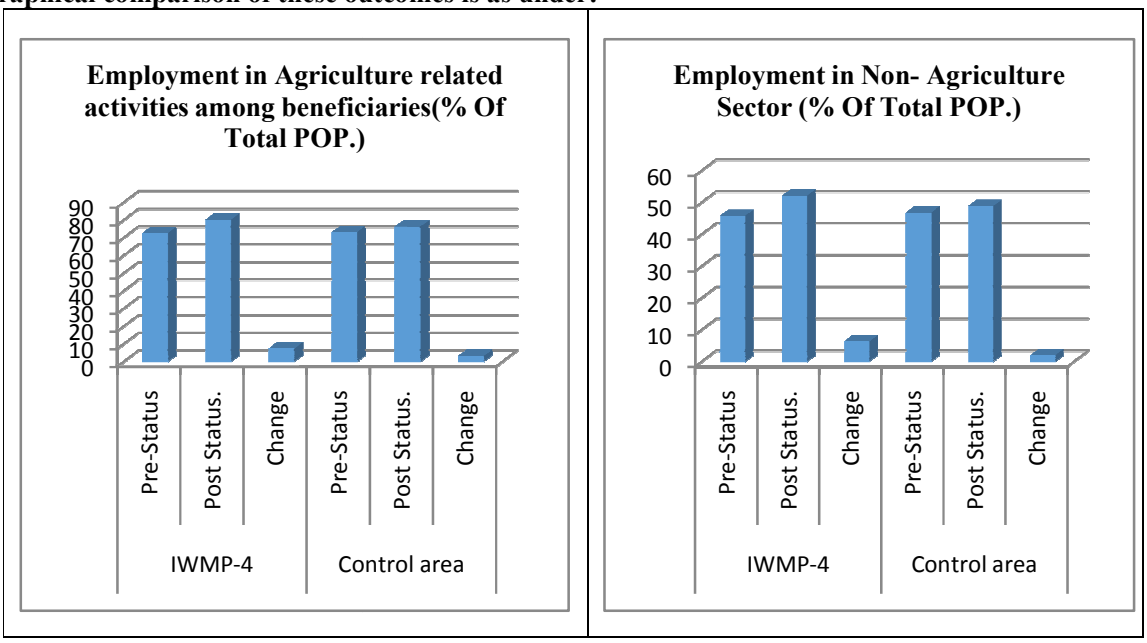
Table: 10.17

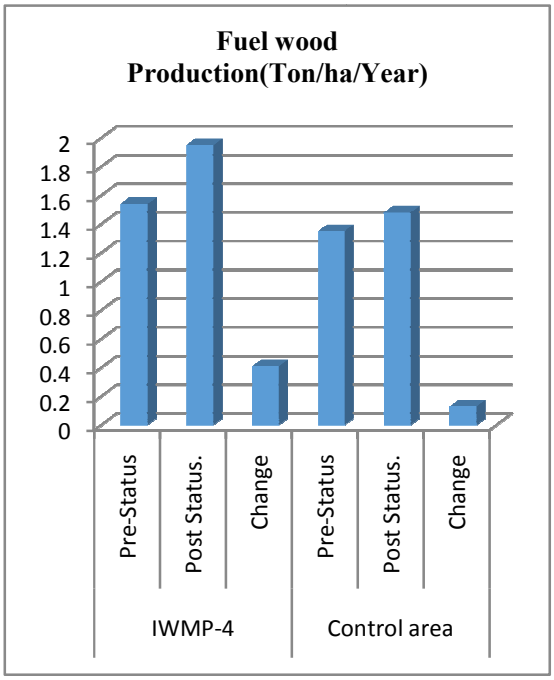
S.no	Items	IWMP- 04			Control area		
		Pre-Status	Post Status.	Change	Pre-Status	Post Status.	Change
1	Employment in Agriculture related activities among beneficiaries (% Of Total POP.)	72.62	80.15	**7.53**	73.14	76.32	**3.18**

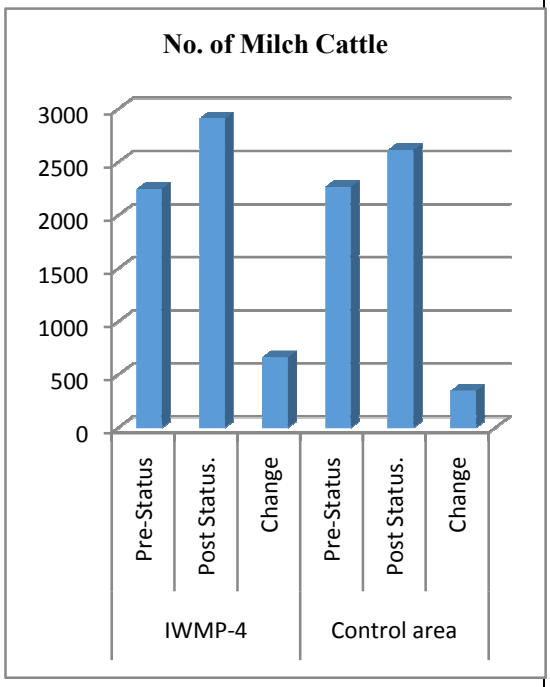
S.no	Items	IWMP- 04			Control area		
		Pre-Status	Post Status.	Change	Pre-Status	Post Status.	Change
2	Employment in Non-Agriculture Sector (% Of Total POP.)	45.78	52.12	**6.34**	46.88	48.9	**2.02**
3	Fuel wood Production(Ton/ha/Year)	1.54	1.95	**0.41**	1.35	1.48	**0.13**
4	No. of Milch Cattle	2249	2912	**663**	2267	2615	**348**
5	Milk Production Of Milch Cattle (Lit.Per. Day per Animal)	6.25	8.25	**2**	5.25	6.75	**1.5**
6	Duration of flow of water in the streams(Month)	3	6	**3**	3	4	**1**
7	No. of persons engaged in ancillary activities like Fisheries, Poultry and Rural craftsmanship (Nos.)	12	19	**7**	9	14	**5**
8	Reduction in migration from rural to urban area in the project area (% Of Total POP.)	7.82	5.15	**-2.67**	7.14	7.92	**0.78**
9	Annual Mean Household Income (RS.)	54690	66968	**12278**	53870	60598	**6728**
10	No. of children enrolled in schools in the project area.(% Of Total Child. POP.)	93.75	100	**6.25**	94.5	100	**5.5**

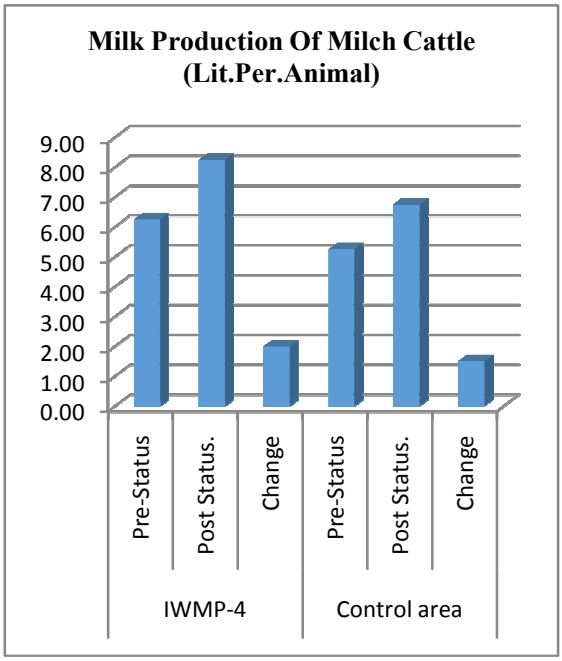
Source: survey by MEL&D agency

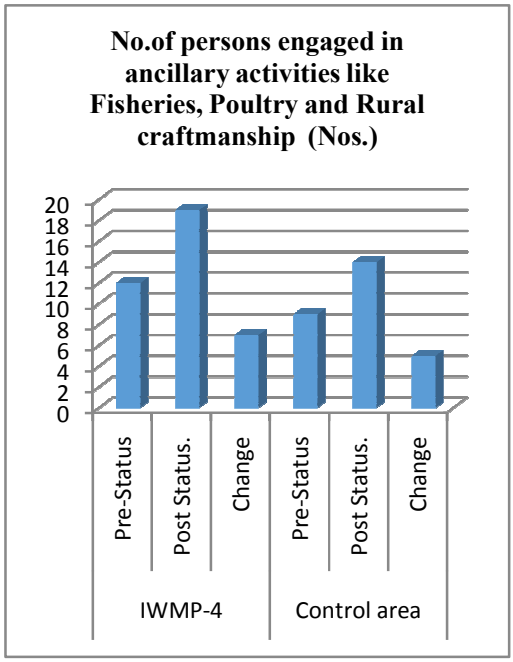
Graphical comparison of these outcomes is as under:

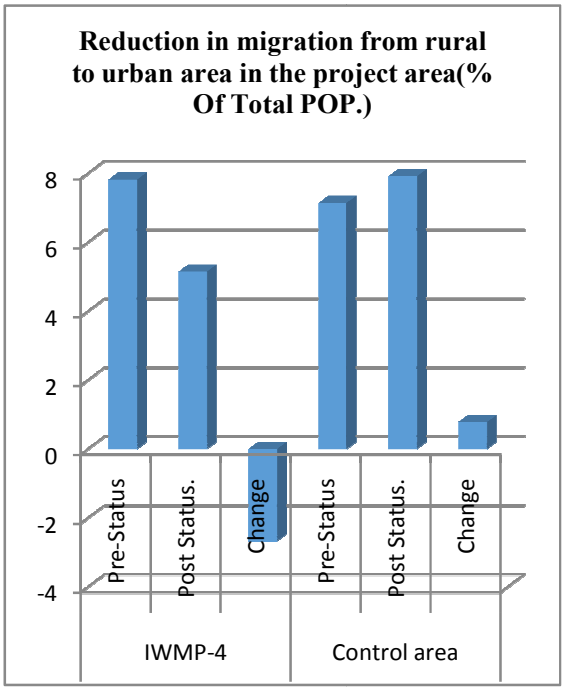


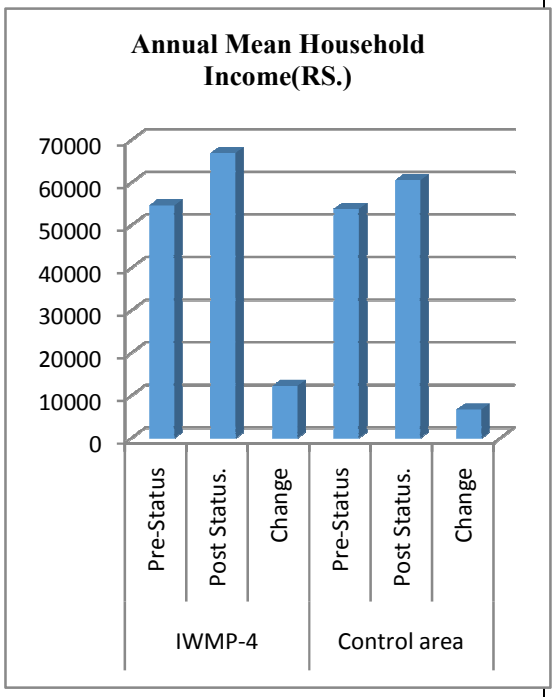

Fuel wood
Production(Ton/ha/Year)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area

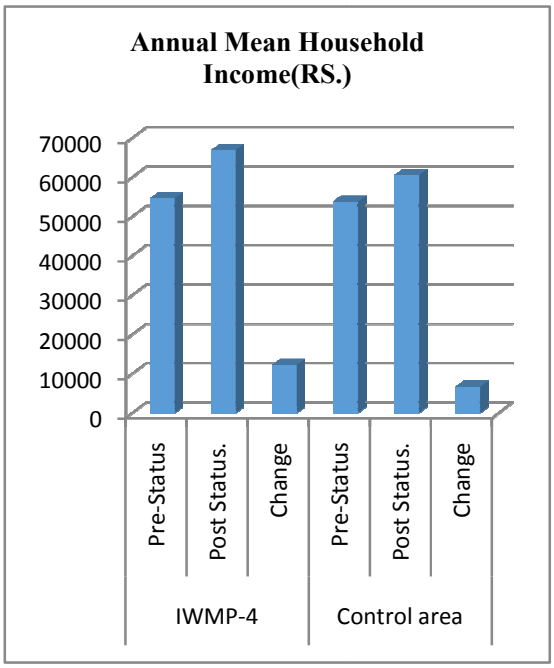

No. of Milch Cattle
3000
2500
2000
1500
1000
500
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area

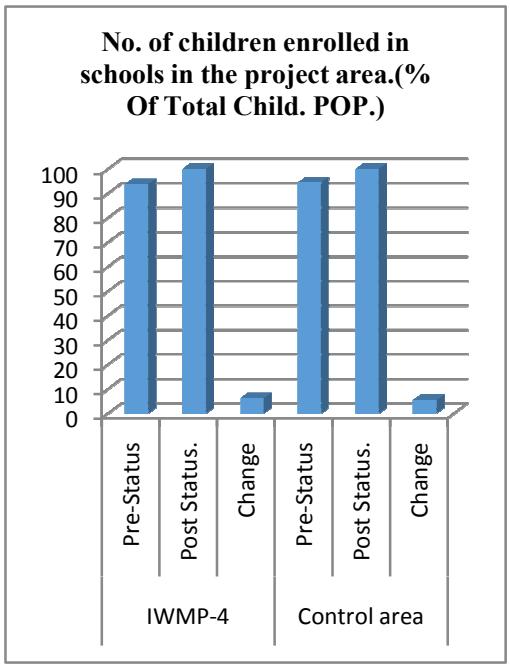

Milk Production Of Milch Cattle
(Lit.Per.Animal)
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area


No.of persons engaged in
ancillary activities like
Fisheries, Poultry and Rural
craftmanship (Nos.)
20
18
16
14
12
10
8
6
4
2
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area


Reduction in migration from rural to urban area in the project area(% Of Total POP.)
8
6
4
2
0
-2
-4
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area


Annual Mean Household Income(RS.)
70000
60000
50000
40000
30000
20000
10000
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area


Annual Mean Household Income(RS.)
70000
60000
50000
40000
30000
20000
10000
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area


No. of children enrolled in schools in the project area.(% Of Total Child. POP.)
100
90
80
70
60
50
40
30
20
10
0
Pre-Status
Post Status.
Change
Pre-Status
Post Status.
Change
IWMP-4
Control area