

**Change in annual income of IWMP Watershed
Beneficiaries: A study of Surat district in South Gujarat,
India.**

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Abstract:

In this climate change scenario and rapid increases in population enhance the demand of natural resources in general and water in particular. This also affect land use pattern and cropping land degradation and the issues of soil erosion also is serious. To determine the impact of Integrated Watershed Management Programme, the present study was conducted in Surat district of South Gujarat. A total of 300 respondents (150 Core activity beneficiaries and 150 Other activity beneficiaries) were selected for the study. The major objective of the paper was to know major determinant change in annual income of watershed beneficiaries in agriculture and allied sector. Ex-post facto analysis was conducted to see change in personal attributes of the watershed beneficiaries. Result indicated noticeable changes in the personal attributes of the beneficiaries of different core and other activities of watershed programs. Regarding impact on Income and employment generation, significant change was determined before and after implementation of Integrated Watershed management Programme. It can also be concluded that induction of watershed management programme has increased the employment of the beneficiaries and maximum number of beneficiaries comes under the group of medium employment group. Because of activities inculcated in watershed programme, different financial facility and other facility also provided to increase employability of this area.

Introduction:

To determine the impact of Integrated Watershed Management Programme, the present study was conducted for 1st IWMP Batch implemented in Six Micro Watershed of Mandvi, Mangrol and Umarpada Taluka of Surat district of South Gujarat. Total 300 respondents (150 Core activity beneficiaries and 150 Other activity beneficiaries) were selected for the study and main objective of the paper was to know major determinant change in annual income of watershed beneficiaries in agriculture and allied sector. Ex-post facto analysis was conducted to see change in personal attributes of the watershed beneficiaries.

Impact of IWMP on Annual Family Income of the Respondents:

With the implementation of IWMP, it is expected to increase in surface water storage capacity and induce ground water table in project area. There will be also seen in improvement of soil fertility and productivity of treated area. This benefit will goes towards common property resources of the command area, too. Due to this treatment it will be positively influence the occupation like agriculture and allied activities directly and occupation such as business, job and other service sector indirectly. It was accessed the change in annual family income of the respondents from various occupation in this research study, which is presented in Table 1 given below.

TABLE 1: SHOWING THE IMPACT OF IWMP ON ANNUAL FAMILY INCOME OF THE WATERSHED BENEFICIARIES.

Occupation	Annual Income Group (in Rs.)	Core Activity Beneficiaries					Other Activity Beneficiaries				
		Pre		Post		Change in Count	Pre		Post		Change in Count
		Count	Table N %	Count	Table N %		Count	Table N %	Count	Table N %	
Agriculture	<= 27000	112	74.7%	64	42.7%	-48	103	76.3%	65	48.1%	-38
	27001 – 50000	31	20.7%	73	48.7%	42	31	23.0%	66	48.9%	35
	50001 - 100000	7	4.7%	10	6.7%	3	1	.7%	4	3.0%	3
	100001+	0	0.0%	3	2.0%	3	0	0.0%	0	0.0%	0
	Total	150	100.0%	150	100.0%	0	135	100.0%	135	100.0%	0
Animal Husbandry	<= 27000	96	100.0%	100	99.0%	4	93	95.9%	88	90.7%	-5
	27001 – 50000	0	0.0%	1	1.0%	1	4	4.1%	8	8.2%	4
	50001 - 100000	0	0.0%	0	0.0%	0	0	0.0%	1	1.0%	1
	100001+	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	Total	96	100.0%	101	100.0%	5	97	100.0%	97	100.0%	0
Business	<= 27000	3	75.0%	3	75.0%	0	3	75.0%	1	25.0%	-2
	27001 – 50000	1	25.0%	0	0.0%	-1	1	25.0%	3	75.0%	2
	50001 - 100000	0	0.0%	1	25.0%	1	0	0.0%	0	0.0%	0
	100001+	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	Total	4	100.0%	4	100.0%	0	4	100.0%	4	100.0%	0
Job	<= 27000	1	20.0%	0	0.0%	-1	0	0.0%	0	0.0%	0
	27001 – 50000	0	0.0%	1	20.0%	1	0	0.0%	0	0.0%	0
	50001 - 100000	3	60.0%	2	40.0%	-1	0	0.0%	0	0.0%	0
	100001+	1	20.0%	2	40.0%	1	0	0.0%	0	0.0%	0
	Total	5	100.0%	5	100.0%	0	0	0.0%	0	0.0%	0
Farm Labour	<= 27000	21	100.0%	22	100.0%	1	38	100.0%	36	94.7%	-2
	27001 – 50000	0	0.0%	0	0.0%	0	0	0.0%	2	5.3%	2
	50001 - 100000	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	100001+	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	Total	21	100.0%	22	100.0%	1	38	100.0%	38	100.0%	0
Other Occupation	<= 27000	0	0.0%	0	0.0%	0	62	100.0%	62	100.0%	0
	27001 – 50000	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	50001 - 100000	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	100001+	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	0
	Total	0	0.0%	0	0.0%	0	62	100.0%	62	100.0%	0
Annual Income from All Sources	<= 27000	66	44.0%	16	10.7%	-50	68	45.3%	11	7.3%	-57
	27001 – 50000	73	48.7%	103	68.7%	30	78	52.0%	112	74.7%	34
	50001 - 100000	8	5.3%	25	16.7%	17	4	2.7%	26	17.3%	22
	100001+	3	2.0%	6	4.0%	3	0	0.0%	1	.7%	1
	Total	150	100.0%	150	100.0%	0	150	100.0%	150	100.0%	0

Source: Field Data 2017-18

The annual family income of the respondents from different occupation like agriculture, animal husbandry, business, job, farm labour and other occupation was segregated in four major groups of (I) Less than Rs. 27000 (II) Rs. 27001-50000 (III) Rs. 50001-100000 and (IV) Rs. 1 Lac above. The income before the implementation of IWMP was recalled by the respondents and the current year income of the beneficiaries noted and compared for impact analysis.

(I) Impact on Agricultural Income:

It was observed that, out of 150 core activity beneficiaries 112 respondents were earning Rs. 27000 and below income before IWMP intervention. In other words they were felled in Below Poverty Line category. After the implementation of IWMP this figure was declined and remained to 64 numbers of respondents. This positive change upgraded 48 respondents to next slab of income level such as, 42 respondents were reached in Rs. 27001-50000 income level, three respondents hit Rs. 50001-100000 income group and three numbers upgraded their family annual income beyond Rs. 100000 due to IWMP works.

Similar observation was also seen in other activity respondents, out of 135 such respondents who were engaged in agriculture occupation, 103 (76.30 per cent) were belong to BPL income category. After implementation of IWMP 38 respondents upgraded their income, out of which 35 settled in Rs. 27001-50000 income group and rest of three enjoyed their annual family income in Rs. 50001-1 Lac income group. From the above results it may be conferred that, irrigation facilities play a dominant role in determining the crop of a region, it can change the pattern of crops too. Assured water supply has enabled the farmers to have two or three crops in a year. As a result of which, the farm income had increased.

(II) Impact on Animal Husbandry Income:

Animal Husbandry occupation works like secondary source of income togetherness with agriculture. Majority of the core activity beneficiaries were adopted this business with agriculture. There were 96 respondents engaged in animal husbandry occupation and earning Rs. 27000 and below annually before IWMP. Watershed activities attracted five new respondents to be with this profession by the end of project. After the implementation of IWMP total 101 respondents were attached with this occupation, out of these 100 respondents were earning up to Rs. 27000 annually and one was reached to the Rs. 27001-50000 income slab.

In case of other activity beneficiaries, 97 respondents were attached with this occupation before IWMP. Among them 93 were earning up to Rs. 27000 and four respondents were earning Rs. 27001-50000 family income from this occupation annually. After IWMP no one new respondent of other activity beneficiaries was found to start this profession but, those who had already attached to this activity four respondents were upgraded and added to Rs. 27001-50000 category and one was upgraded in Rs. 50001-100000 income group category.

(III) Impact on Business Income:

There was equal number of business practicing beneficiaries (Four respondents) in both categories of respondents having traditional local shop. Before IWMP three respondents were pertained to less than or equal to Rs. 27000 income group and only one was felled in Rs. 27001-

50000 income category in both the group. After IWMP one of core activity beneficiary was upgraded his income group from Rs. 27001-50000 to Rs. 50001-1 Lac. Whereas two beneficiaries of other activity beneficiaries were improved their income between Rs. 27001-50000.

(IV) Impact on Job Income:

Among core activity beneficiaries' five respondents were found to do job. Before the implementation of IWMP one of them was earning up to Rs. 27000, three respondents were getting salary between Rs. 50001-100000 and rest of one was earning more than Rs. 1 Lac in form of salary. After the IWMP two respondents were found in more than Rs. 1 Lac income group, two respondents were in Rs. 50001-1 Lac income group and one was settled in Rs. 27001-50000 income group. This up gradation might not be the direct influence of IWMP activity. No one respondent of other activity beneficiaries was found in job.

(V) Impact on Farm Labour Income:

There were 21 families in core activity beneficiaries and 38 families in other activity beneficiaries adopted farm labour occupation as a source of income before IWMP. Cent per cent of them were earning up to Rs. 27000 per annum from this occupation. Core activity beneficiaries were practiced this one as a secondary source of income simultaneously with rainfed farming, but for some of the other activity beneficiaries this occupation was considered as full vehicle of earning. After IWMP activities one family was added from core activity beneficiaries in this occupation, but the income slab remained same for all. While two respondents of other activity beneficiaries were reached in Rs. 27001-50000 income category. This might be due to the effect of soil and moisture conservation activities had been increased the farm labour demand for timely completion of agricultural works. It was also observed in rising of cost of farm labour work during field work.

(VI) Impact on Other Occupation Income:

It was interesting to know that 62 families of other activity beneficiaries (more than 40.00 per cent) were introduced in different livelihood activities through self-help groups (SHGs) after the implementation of IWMP. This might be the real reflection of emphasis on livelihood and micro-finance activities among small and marginal land holders and asset less beneficiaries. This new start-ups were enriched them with additional income up to Rs. 27000 per annum in their family.

The effectiveness of any programme can be reflected on the occupation of beneficiaries. Successiveness of the programme might be evaluated through the change in income level or up gradation in economic categories. From the table 29 it can be concluded that, 35.67 per cent of

the total beneficiaries (107 families) had disposed of their Below Poverty Line income and upgraded their annual family income due to the implementation of IWMP in project area. This indicates the significant effect of IWMP in project area.

Comparison between Average Annual Family Incomes and the different Sources of the Income:

In addition to study of the occupation wise change in annual family income slab, it was also tried to compare the change in the average annual family income within different occupation due to the impact of IWMP. Generally the income estimates are subject to limitations in reporting the income. In order to overcome this limitation, it was tried to derive the responses from the beneficiaries about their net annual income earned from the different occupations such as Agriculture, Animal husbandry, Business, Job, Farm labour work and other occupation before the implementation of IWMP and after the implementation of IWMP. Table 2 provides the occupation wise impact of IWMP on average annual family income of the watershed beneficiaries. This change may also reflect which occupation was benefitted more and which category of respondents benefitted are discussed below;

TABLE 2: SHOWING THE OCCUPATION WISE IMPACT OF IWMP ON AVERAGE ANNUAL FAMILY INCOME OF THE WATERSHED BENEFICIARIES.

Occupation	Core Activity Beneficiaries				Other Activity Beneficiaries			
	Average Income in Rs.		Change		Average Income in Rs.		Change	
	Pre IWMP	Post IWMP	in Rs.	in %	Pre IWMP	Post IWMP	in Rs.	in %
Agriculture	25386	34723	9337	36.78%	23467	31126	7659	32.64%
Animal Husbandry	6855	10755	3900	56.90%	10113	14598	4485	44.34%
Business	23000	28750	5750	25.00%	19500	34500	15000	76.92%
Job	103000	150000	47000	45.63%	0	0	0	N.A.
Farm labour	5429	7909	2481	45.69%	9816	13763	3947	40.21%
Other Occupation	0	0	0	N.A.	0	2419	2419	N.A.
Total of All Sources	34663	49170	14507	41.85%	30533	42403	11870	38.88%

Source: Field Data 2017-18

The data presented in Table 2 indicates that, after the implementation of IWMP, the average annual income was raised in all type of occupation in general. As in case of Agriculture occupation the core activity beneficiaries were earning average INR 25386 before IWMP implemented. It was raised up to 36.78 per cent and reached at average annual income of INR 34723 from this occupation. Slight lower than this type of change was also observed in other activity beneficiaries, who were indirect beneficiaries of soil and moisture conservation activities by escalating the average annual income from INR 23467 to INR 31126. This change also counted 32.64 per cent increase from pre IWMP average annual income. It is worth to note that, after the implementation of IWMP the average annual income per house hold of core

activity beneficiaries was raised INR 9337 from agriculture occupation, while other activity beneficiaries got effervescence of INR 7659 in average annual income. This might be due to the fact that soil and moisture conservation activities induces soil moisture and reduces the depletion of soil fertility and productivity. It also increases irrigation potential to certain extent that land may be utilized at its optimum capacity. Ultimately introduction of new crops, crop rotation and change in package of practices become easy for all direct or indirect beneficiaries in watershed area.

Increase in production of agriculture and its byproducts was also boosted animal husbandry profession after implementation of IWMP, as increasing in agriculture made easy availability of major inputs for this profession. In this occupation other activity beneficiaries were more benefitted compare to core activity beneficiaries, because majority of small and marginal farmers and asset less beneficiaries were engaged in this occupation. Among other activity beneficiaries pre IWMP annual average income was INR 10113 from animal husbandry, which can be raised to INR 14598 with a difference of INR 4485 (44.35 per cent) more after completion of IWMP. Most of core activity beneficiaries were doing this occupation as a secondary source of income. They also caught benefit of INR 3900 as an annual average income per household in this occupation.

In general tendency of the Indian economy, growth of primary sector always arose the opportunity to grow secondary and tertiary sector. Occurrence of positive change in the annual average income after implementation of IWMP tends to push purchasing power of benefitted people. Due to this reason it was reflected 76.92 per cent (INR 15000 annual average income) growth in the business of other activity beneficiaries, while among businessman of core activity beneficiaries it was noted the positive difference of INR 5750. The remarkable change in the annual average income was also seen in case of Job people of core activity beneficiaries in treated watershed area. This might not be a direct influence of IWMP on service occupation.

Charismatic growth of agriculture indeed invites more materials and men power for timely operation. Thus, it will increase farm labour requirements with effective compensations. As a result of this, the respondents of other activity beneficiaries who were engaged as farm labour for their livelihood reported INR 3947 growth in annual average income. This was 40.21 per cent hike from previous one. The remuneration of farm labour beneficiaries in core activity beneficiaries were also increased up to 45.68 per cent. This might become a major factor for rendering upward migration of wage labour and overall economic development of watershed area.

Livelihood activities were promoted within IWMP to increase the income opportunity through self employment for the BPL/ landless or small and marginal land holding beneficiaries by allocating exclusive project fund through self-help groups for the same. The other activity beneficiaries who had started the micro enterprises or cottage industry added INR 2419 in their annual average income additionally.

Overall core activity beneficiaries and other activity beneficiaries had raised 41.85 per cent and 38.88 per cent annual average income respectively.

Comparison between Average Annual Family Incomes and Farmer category:

Various studies had stated that, the major benefits of earlier watershed projects denied to small and marginal farmers as well as asset less peoples. It was only remain bent to big farmers having major holdings, good resources, better socio-economic condition and innovativeness. It was tried to assess whether the same trend retains in IWMP of New Common Guidelines or else it fulfills the promises given to vulnerable society. To get a lucid picture the change in average annual income was compared with the prescribed three categories of farmers in the study. The data obtained from that are presented in Table 3 given below;

TABLE 3: SHOWING THE IMPACT OF IWMP ON AVERAGE ANNUAL FAMILY INCOME OF THE DIFFERENT FARMER CATEGORIES.

Farmers Type	Land Holding in Hectare	Average Annual Income from Agriculture in Rs.		Change	
		Pre IWMP	Post IWMP	Mean	%
Marginal Farmers	0.01 - 0.99	26719	35547	8828	33.04
Small farmers	1.00 - 1.99	23340	31660	8320	35.65
Big Farmers	2.00+	25858	37514	11656	45.07

Source: Field Data 2017-18

It is clearly indicated that, no any farmer category can be hindered to take benefit from implementation of IWMP. Each and every category of farmers satisfactorily developed their average annual income by improvement in agriculture through soil and moisture conservation activities directly or circuitously. It can be observed from the Table 3 that, Marginal Farmers who hardly possess small fraction of land and use to practice traditional way of farming had arouse 33.04 per cent growth in farming occupation only due to the benefits taken from IWMP. Small farmers were slightly more increased their average annual income compared to Marginal one. They brought their income in new height from INR 26719 to INR 35547. In case of Big Farmers growth scenario observed nearly fifty per cent; they could find the way to increase their agricultural income up to INR 11656. Though Big Farmers were taken more advantage in

terms of production due to modern resources, Small and Marginal Farmers were enthusiastically changed their average annual income after implementation of IWMP.

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