

# WATERSHED DEVELOPMENT PROGRAMME: A STUDY OF PURDAL HALLA WATERSHED IN VIJAYAPURA DISTRICT

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## Abstract

Man and Environment are interdependent with each other's. The fluctuations and environmental changes directly and indirectly affect human life. Due to the environmental degradation, climate change rainfall is not distributing equally all over the country in right season. Through this situation, India is being facing serious problem of drought. To tackle these problems Government of India taken an initiative like watershed development approach. Watershed development programme concentrates on dry land area and rain fed regions, because these areas productivity is about 55 percent of agricultural production and providing a necessary food for the 40 percent of population in India, even though India comprises 65 percent arable land. In the words of Department of Land Resources (DoLR) in 2006 'Rain, fed areas also are a one of the major part of Indian agriculture and it has greater utilization potential so there is need to develop these areas to fulfill the food security demands within 2020.'

This paper attempted to find out the changes in cropping pattern, productivity and socio-economic aspects in Purdal village because of watershed project. For this purpose 50 respondents were interviewed, and given some suggestions to improve the situations in the area.

**Key words:** Watershed, Cropping Pattern, Productivity.

## **Introduction:**

The productivity of any crop mainly depends on crucial natural resources namely, land and water in addition to management practices. Therefore, conservation, up-gradation and utilization of these natural resources on scientific principles are essential for sustainability of rain-fed agriculture. The concept of watershed development for rain-fed areas is gaining importance over the years and it amply demonstrated that, watershed development tools are very effective in meeting the objectives with a mission approach.<sup>1</sup>

India is an agro-based country; more than 59 percent of the population is purely lagging behind agriculture for their daily bread. However, the water resources and irrigation potential is very poor in this country, on the other hand monsoon plays gambling with Indian agriculture sector. In this context, the Government of India (GOI) had taken a major initiative to develop rain-fed and dry land areas through watershed approach.

After the Green Revolution, no doubt about that Indian agriculture sector has developed but also brings out a drastic change in cropping pattern, productivity and area under cultivation, but on the other hand it causes the regional imbalance as well as income imbalance among the farmers which leads to create poverty in small, marginal and landless labors in India. To tackle-up these problems of uncertainty and uneven rainfall over the year

and uneven availability of sufficient water resources all over the country GOI is implementing watershed programmes for rain-fed and dry land areas.

Watershed Development is an integrated part of agricultural sector, because of the support it provides to a wider range of activities of agriculture, horticulture, fisheries and forestry. Watershed development is especially important for Karnataka because of low irrigated area of 26percentas against 39 percent of national average and the scope for increasing irrigable area has its own limitations. Development of rain fed assumes critical importance as more than 44 percent of crop production is from these areas.<sup>2</sup>

#### **Meaning of watershed:**

Water is an important and integral part of human and agriculture activities. Therefore, management of water is necessary for the well-being of all lives. A watershed synonymous with catchments is made up of the natural resources in a basin namely soil water and vegetation the comprehensive management of these natural resources to make productive use of these and get more yield and better income and employment opportunities is termed as watershed management.

A watershed constitutes most appropriate basic unit for natural resource use planning and management. It is now considered the most effective method of drought proofing the Government of Karnataka have taken a few pioneering steps in the development of appropriate models for dry land watershed development and management.<sup>3</sup>

#### **Problem of the study area:**

This Watershed is characterized by undulating area leading to high soil erosion, low productivity and lack of irrigation, safe drinking ware facility and migration in seeking of employment. There is an average 629mm rainfall with uneven distribution 20-46 heavy rainy days leading to soil erosion one to poor vegetative cover food fodder full deficit is there and in some area Nala depth is more. Drinking water, food, fuel, and fodder for animals is the severe problem in this area, hence needed to take up soil and water conservation measure and irrigation.<sup>4</sup>

#### **Objectives of the study:**

- To study the problem of the Study area.
- To know the impact of watershed on cropping pattern, productivity and socio economic conditions of Respondent.
- To suggest remedial measures for the problems

#### **Methodology:**

Vijayapura has five taluks namely,

1. Vijayapura
2. Basavan bagevadi
3. Indi
4. Sindagi and
5. Muddebihal

For the present research work, Sindagi Taluk has purposively taken for the study for the collection of data both secondary and primary data were used, for the analysis simple ratio and percentage method was used. Secondary data was taken from Zilla Panchayat and Gram Panchayats as well as Detailed Project Report of the watershed programme IWMP -4 Vijayapura. Primary data was collected from interviewing the beneficiaries in the study area. For this purpose, 50 respondents were selected in puradal village, based on purposive sampling. With the help of suitable interview schedule.

**Background of the study area:** The Purdahlalla IWMP-4 having micro code numbers

- Korwar GP-4D5A3A1a, 4D5A3A1c, 4D5A3A1e.
- Kokatnur GP- 4D5A3A1f,
- Gubbewad GP-4D5A3A1g,
- Handiganur GP-D5A3A2b, 4D5A4A2d and area comes under northern dry climatic zone. The present Watershed Study covers eight villages i.e., Korawar, Kokatnur, Handiganur, Purdal, Varakanalli, Boragi, Gubbewad, Hadaginal, Under the four Gram Panchayats namely, Korwar, Kokatnur, Gubbewad and Handiganur.

**Table No. 1**  
**Executive Summary**

Sl. No	Particulars	Details
1	Scheme	Integrated Watershed Management Programme
2	District	Bijapur
3	Taluka	Sindagi
4	Project Name	Iwmp-4-2009-10 Purdal Halla
5	Sub-Watershed and Project code	Purdal Halla Sws 4d5a3a
6	Project period	2009-10 To 2013-14
7	Project location	Korwar, Kokatnur, Gubbewad, Handiganur, Grampanchayat 16 53'35"-N, 76 12'02"-E
8	Area Details	Area Of The Project Is 5292.10ha And Proposed To Be Treated 4811.Ha

Source: Detailed Project Report of IWMP-4.

The above table No.1 clearly explains about the project details of the purdal halla watershed. It shows the basic features of the watershed.

**Area and details:**

Among the total area of the project 5292.10ha, the area available for treatment is 4811ha. The project duration is 2009-10 to 2013-14. In the treatable area arable land, and non arable land, drainage line treatment, horticulture planting, forest planting, live stock programs and common property resource development are included. Here ridge to valley watershed concept is adopted.

**Criteria for selection of watershed:**

- Poverty index is above 80%.
- Actual ground water level is bellow and minimum.
- Less than 20% area under assured irrigation.
- Small and marginal farmers are more.

**Table No. 2**  
**Land use pattern**

Type of land	Total Geographical area (Ha.)	Ha.	% of geographic area

Private lands	5238.11	4757.01	89.89
Community lands	24.22	24.22	0.46
Reserve forest lands	0.00	0.00	0.00
Revenue lands	29.77	29.77	0.56
Others	0.00	0.00	0.00
<b>TOTAL</b>	<b>5292.10</b>	<b>4811.00</b>	<b>90.91</b>

Source: Detailed Project Report of IWMP-4.

It is clear from the above table that, purdal halla watershed has total geographical area about 5238.11 ha, out of which 4811 ha. Should be treated under this programme. out of which 275.23 ha. land is irrigated and remaining 4535.87 ha is rainfed. From the above table it is clear that, privet land has more portions to treat and there are no reserve forest areas in the Purdal village.

**Table No. 3**  
**Composition of farmers**

Name of the project	Type of stakeholder	No. of the households	No. of BPL households
Iwmp-4 Pudalhalla watershed	Large farmers	820	---
	Small farmers	850	776
	Marginal farmers	701	542
	Landless farmers	1329	1267
	<b>TOTAL</b>	<b>3700</b>	<b>2585</b>

Source: Detailed Project Report of IWMP-4.

It is evident from the above table that, in this area a large number of farmers are belongs to landless labors, later on followed by small farmers and the marginal farmers.

**Table No. 4**  
**Composition of the respondents**

Sl. No.	No. of respondents	Percentage
Male	30	60
Female	20	40
<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field Survey

The above table indicates the composition of the respondents that, the researcher taken to the field survey. This study comprises the 30 male respondents (60 percent) and 20 female respondents (40 percent) for the survey. Based on the samples survey concentrates on cropping pattern and productivity changes in the area.

**Table No. 5**  
**Age Group and Education Level of the Respondents:**

Sl. No.	Age group	No. of respondents	percentage	Education level	No. of respondents	percentage
1	15-20	13	26	Illiterate	8	16

2	21-30	22	44	Literate but no formal education.	12	24
3	31-40	10	20	Primary education	15	30
4	41-50	5	10	Secondary	10	20
5	50+	--	--	Higher	5	10
6	Total	50	100	Total	50	100

Source: Field Survey

The above table clearly indicates the age group and education level of the respondents, that out of 50 respondents, a larger number of respondents were belongs to the 21-30 age group. But in the view of education level of the respondents, a more number of respondents (30) educated up to primary education.

**Table No. 6**  
**Occupation and Annual Income of the Respondents**

Sl. No.	Occupation	No. of respondents	Income level	No. of respondents
0	Agriculture labour	35	<10000	35
2	Non agriculture labour	10	11000-20000	10
3	House hold industries	3	21000-30000	3
4	Government employee	2	31000-40000	2
5	Private employee	---	>40000	---
<b>Total</b>		<b>50</b>		<b>50</b>

Source: Field Survey

This table tries to explain about the occupation of the respondents as well as the income level of the respondents. This table clearly shows that, more number of respondents (35) is depended on agriculture, rather than allied sectors. There are no private employees in the area. In the case of income level, 35 samples are living below the poverty line with the income of less than 10000.

**Table No. 7**  
**Sources of irrigation and dependents**

Sl. No.	Sources of irrigation	Pre Watershed		Post Watershed	
		No. of Dependents	Percentage	No. of Dependents	Percentage
1	Rain water	30	60	15	30

2	Canals	8	16	30	60
3	Open wells	1	2	--	--
4	Tube wells	8	16	4	8
5	Village tanks	3	6	1	2
<b>Total</b>		<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>

Source: Field Survey

The above table is evident that, the various sources and the number of respondents depended on the various sources of irrigation. This table compares the changes in the dependency on the irrigation facilities in that particular area. A more number of respondents were depended on the rain water for their agriculture, later will follows canals and tube well before the watershed development programme. After the watershed project, the more number of respondents are now dependent on the canal irrigation which preserving the rain water, and after this rain water utilization is using for the irrigation.

**Table No. 8**  
**Type of Farmers and Land Holdings**

Sl. No	Farmers type	No. of respondents	Percentage
1	Small farmers	18	36
2	Marginal farmers	15	30
3	large farmers	7	14
4	Landless farmers	10	20
<b>5</b>	<b>Total</b>	<b>50</b>	<b>100</b>

Source: Field Survey

It is clear from the above table that, out of 50 respondents, small farmers and marginal farmers are more number in the area, and landless farmers are also more as compared to large farmers.

**Table No. 9**  
**Land use Pattern**

( area in hac.)

Sl. No	Type of the farmers	Irrigated	Rain fed	Total
1	Large farmers	1.78	2720.45	2898.45
2	Small farmers	59.12	1281.40	1340.51
3	Marginal farmers	38.11	534.02	572.13
4	Landless farmers	--	--	--
<b>TOTAL</b>		<b>275.23</b>	<b>4535.87</b>	<b>4811.10</b>

Source: Detailed Project Report of IWMP-4.

The above table shows the composition and proportion of the irrigated and the rain fed area in the purdal halla watershed area. This watershed had total geographical area to treat about 4811.10 ha. in this area rain fed area is 94.27 percent and remaining less than 6 percent land is irrigated. A large portion of irrigated land is

under the hording of small and marginal farmers where as landless farmers don't have any own land to cultivate.

**Table No. 10**  
**Cropping Pattern:**

Sl. No.	Seasons	Pre watershed ( in kg ) per ha	Post watershed ( in kg ) per ha.	Changes in percentage
01	Khariff	900	1300	19
02	Rabi	700	1100	23
<b>Total</b>		<b>1600</b>	<b>2400</b>	<b>20</b>

Source: Field Survey

The above table shows the clear picture about the cropping pattern and productivity in the area. The rain fed areas normally gives production under 40 percent, after the treatment of watershed with soil and moisture conservation in the affected area, the productivity increases up to 10-20 percent. Therefore, this table also showing the same that, in the Kariff season productivity per h. was increased about 19 percent from the previous productivity in the case if Rabi season the productivity increased about 23 percent, totally there was 20percent increase in the area after the implementation of watershed project.

**Table No. 11**  
**Changes of Productivity**

Sl. No	Crops	Pre watershed ha. /kg	Post watershed area in ha./kg.	Changes kg./ha.
01	Bajara	850	1500	650
02	Jawar	1000	1500	500
03	Paddy	---	--	---
04	Ground nut	1500	2000	500
05	Mixed Crop	800	1500	600
06	Others	1500	2000	500

Source: Field Survey

It is evident from the above table that, there is a change in the crop productivity in the area due to the watershed project. The productivity per ha. Bajara has increased from 850 to 1500, which is near about 50percent. In addition, jawar, groundnut, mixed crops and other products have raised a notable extent. However, in this area production of paddy not existed as in more irrigated and fertile land.

**Table No. 12**  
**Changes in the Productivity in kg./ha.**

Sl. No.	Crops	Pre Watershed	Post Watershed
01	Wheat	800	1500
02	Gram	1100	935
03	Jawar	1000	2500
04	Other	1800	2010

Source: Field Survey

It is evident from the above table that, there is an increase in the productivity of various food grains in the Purdal village. Wheat has increased from 800kg/ha. To 1500 kg/ ha. However, in the case of gram

production, it has decreased due to certain reasons, and production of jawar has increased from the pre watershed period to post watershed period.

**Table No. 13**  
**Participation of respondents in SHGs**

Sl. No.	No. of respondents	Members in SHGs
Male	30	10
Female	20	20
<b>Total</b>	<b>50</b>	<b>30</b>

Source: Field Survey

The above table clearly explains about the participation in SHGs in the area. With this table, it is clear that out of 50 respondents, 30 were male and 20 were female. Out of 30 male respondents, 10 respondents are the active members in the SHGs, but out of 20 female respondents, all of them are the active participators in SHGs. That means the women participation ratio in SHGs is higher (100%) than men participation (33%).

**Table No. 14**  
**Employment wage change (in Rs.) in the area**

Sl. No	Wage Rate	Pre WDP	Post WDP	Changes in %
01	Men	250	300	10
02	Women	150	200	15

Source: Field Survey

It is evident from the above table that, wage rate of men and women is raised from the pre-watershed period to post –watershed period. Before the watershed, the wage rate of men is about Rs.250 per day, which is Rs. 100 higher than the female wage rate. After the implementation of watershed project in this area, the wage rate has increased about 10 percent in men’s wage and 15 percent in women’s wage. It shows that, the people have the good economic condition as compared to previous years.

**Findings:**

1. Small, marginal and landless farmers are in more numbers in the area.
2. More number of respondents is availed only primary education.
3. In total 50 respondents 30 were agriculture labors that means dependency on agriculture is more in the area.
4. Dependency of source of agriculture irrigation has changed after the watershed project.
5. There is no irrigated land for the landless farmers.
6. Cropping intensity has increased from pre-watershed to projects to post project.
7. Wage rate has increased from before watershed to after the watershed.
8. Migration has declined as compared to pre-watershed period.
9. Women’s participation in SHGs is more as compared to men. That means, women are becoming economically stronger.
10. Allied activities are increased.
11. Agro-horticulture has developed in the area.

**Suggestions:**

1. Government should give more provisions to dry land and rain fed farming.
2. Local government should concentrates on the remedial measures for the local area problems
3. Farmers should convert the cropping pattern from the agriculture to horticulture with allied activities.



4. Govt. should give the training regarding the dry land farming technologies on the monthly basis.
5. Wage discrimination should be removed through equal wages for this purpose government should take steps.

**Conclusion:**

IWMP aims at improving the situation of the area during the project period 2009-10 to 2013-14. In addition, this scheme is prioritized to migrate the existing parameters like poverty, productivity of soil, migration, degraded land etc. WDT of watershed development is the Project Implementing Agency in Sindagi IWMP-4. The project was implemented through promoted CBO's during the project period. Commonly known CBO's are SHG's, UG's and WC's. Totally, 51 SHG's, 41 UG's formed in eight villages. At Gram Panchayat level 4 watershed committees have been formed. Overall, more than 80% of families coming under watershed area are going to take part and contribute in the watershed programs in the various institutional forms.<sup>5</sup>

Because of implementation of watershed development projects farmers have realized several benefits as compared to non-watershed areas, and have diversified their activities from agriculture to agro horticulture and agro forestry in order to better their income. Implementation of soil and water conservation programmes in watershed areas has resulted in the significant increase in the underground water table through water recharge

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