

# Water Resources Management the Case Study of Kadwanchi Village in Jalna District

**Dr. Sunil KHANDEBHARAD**

Assistant Professor and Head Dept. of Geography

M.S.S. Arts College Tirthpuri Tq. Ghansawangi Dist.Jalna

## ABSTRACT

In the present research paper the progress of Natural resources management of Kadwanchi village in Jalna district of Maharashtra State. This paper is an attempt to rescue thinking about community, participation and Natural resources from the dominant discourse on development and to visualize it more openly. The exercise begins with an examination of the genesis and nature of prevailing concepts and efforts of community participation in natural resource management in government and non-government projects of forestry watershed development, Pasture improvement, and conservation. The purpose of this study was to find out whether the disadvantaged community participants find their participation in catchment management forum to be meaningful. A qualitative research approach that involved the use of primary and secondary data sources were used to achieve the aim of this study. These are shown to be part of the command systems of state-corporatist management of people and natural resources from the local to global levels. Also, it was observed that participants did not understand the technical nature of information presented resource management, It is therefore important that more emphasis be placed on the development of skills and capacity of participants to understand and make meaningful contribution, especially participants from the disadvantaged communities.

**KEYWORDS:** Natural resources, Watershed Management, Water Resources Management.

## INTRODUCTION

Watershed has been defined as a geo-hydrological unit draining to a common point. Essentially a Watershed is a land area which captures rainfall and conveys to an outlet. A small Watershed of a few hectares draining into a small drainage channel may from part of a large Watershed may become a major river basin draining from millions of square kilometers of land. The above definition mostly postulated by the hydrological depicts that Watershed is much more complex. In fact Watershed is a biological, physical, economic and social system based on integrated approach.

## STUDY AREA

Kadvanchi is small village in Jalna district located 18 km away from the Taluka head quarter at Jalna town. The soil are shallow texture with moderate water holding capacity in the year 2000, Kadwanchi was completely on rainfall farming took place only in kharif rainy soon season. Kadwanchi Watershed consists of three villages namely Kadwanchi, Waghrol, and Nandapur with area 1607.64, 28.40 and 252.0 hectares respectively. Kadwanchi Watershed is situated between latitude 19° 53' N and longitude 75°, 00' E.

## OBJECTIVES

1. To promote the economic Development projects Village community which is directly of indirectly dependent on the watershed, through optimum utilization of watershed natural resources.
2. Encourage restoration of ecological balance in the village through sustained community action for the operation and maintenance of assets created.
3. To study develop a participatory integrated plan for the village and resource support through involvement of other stakeholders.

## RESEARCH METHODOLOGY

In present research paper primary and secondary data is highly relied upon. The primary data is the raw data collected through difference sources for which special questionnaires were designed and information collected through various offices. Such data is collected from published and unpublished literature, Socio economic review, Agricultural department, Social forestry department of Jalna, KVK Jalna Report, along with laid down of government of India is to launch a common approach for watershed Development programme Reports.

## DISCUSSION

**Kadwanchi watershed:** Comprises 1888 hectares of land spread in the village of Kadwanchi (1607.6 ha) Waghul (28.4 ha) and Nandapur (252.0 ha). Common land within the watershed extends to 339.55 ha. Mainly forest land or revenue land. The Population of Kadwanchi Village, the main Village is 1954. The major drainage line of the watershed is Upper purna River. The highest elevation of the Watershed is 646 m above mean sea level and the lowest elevation is 498 m. The watershed receives an average annual rainfall of 440mm. The Watershed is situated in a severely drought prone area Kadwanchi watershed had the same barren and dim look of other village in the Marathwada region.

**The Facilitating Organization KVK Jalna and WOTR:** In 1997-1998, Karisivigyan Kendra, Jalna in association with WOTR decided to adopt this village for watershed development. The spirit behind the project was Mr. Vijayanna Borade, Scientist and founder of the KVK. The work started with a number of Social Mobilization activities like Farmer's festivals and women festivals to establish contact with farmers and to identify problems of the watershed. Water scarcity and absence of soil conservation measures emerged as the major constraints to agricultural production and economic growth, caused by loss fertility due the erosion of top soil.

**Watershed Development Works:** The watershed works taken up included both area treatment and drainage line treatments, following the ridge to valley approach. Area treatment included continuous contour trenches farm bund, plantations, agro forestry and agri- horticulture etc. Drainage line treatment included gully plugs, gabions, check dams, farm ponds etc. Table no. 1 shows the details of various types of work undertaken.

## DIFFERENT WSD WORKS IN KADWANCHI WATERSHED

Table No.1

Treatment	Quantity	Types of work done
<b>Area Treatment Structures</b>		
CCTs	368.71 ha	On CPR
Farm bunds	1000 ha	On Farmland
Plantation	132 ha	Both on CPR Farmer lands
A forestation	157.71 ha	Timber and fuel wood plantation
Agro forestry	211.0 ha	Dry land horticulture plantation
Agro horticulture	130.79 ha	Dry land horticulture plantation along farm bund
Crop cultivation	995.34. a	Grass seeding on bunds and crop cultivation
<b>Drainage line Treatment Structures</b>		
Gully plug	4250 m	Collecting and laying loose rubbles
Gabions	54	Constructed by loose rubbles in mesh wire
Masonry gully plug ( check weir)	10 No's	Constructed in Un-coursed rubble stone masonry (U.C.R)
Check dams	09 No's	Constructed in Cement concrete
Repair of stream Bunds	11 No's	Constructed spill way by U.C.R.
Check dams	19 No's	On CPR
Tank repair	9 No's	On CPR
Farm Ponds	153 No's	NHM and RKVY Funds

Source: KVK, Jalna

**The major benefits of the structures were the following:**

1. Masonry gully plug or check wire on mature gullies with minimum grads and maximum depth helped to retain and harvest water, resulting in recharge of wells in the surrounding areas.
2. Check dams constructed on drainage lines that had high discharge of water and had hard strata for strong foundation helped to sustain the thrust of large volume of stored water.
3. Gully plugs and gabions effectively contributed to reducing water velocity and conserving valuable soil. Structure like proper spillways complemented the soil and water conservation actions.

**Key Technology in Kadwanchi- Continuous contour Trenches:** Through the watershed development activities in kadwanchi relied on multiple technologies, the key technology we focus on here is continuous contour trench (CCT). The continuous trench from a kind of girdle around the hill slope at a given contour, as part of treating non-arable area of hill slopes. The primary purpose of continuous contour trenches is to prevent soil erosion in upper reaches of watersheds. They achieve this by breaking the slope and reducing the velocity of runoff, there by conserving soil and storing rainwater in the trenches. The result is regeneration of natural vegetation in the upper reaches of a watershed. Construction of continuous contour trenches in o area of

1337.1 ha of the watershed facilitated in –situ conservation of rainwater. Cattle trench surrounding the vast fellow land planting of trees and bushes like gliricida, prosonpisjulflora, agave, and other strengthened the CCTs. The other activities in Table 1 complemented this activity.

Watershed development becomes more effective when it is accompanied by improved agronomic practices like contour cultivation, conservation furrows, mulching thinning inter cropping, use of certified etc. Extension service provided by KVK Scientists helped kadwanchi farmers to consolidate the gains watershed development.

**Financial Investment:** The project received funding support under the Indo-German Watershed Development programme, Through the National Bank for Agriculture and Rural Development (NABARD). Overall project cost was INR122 million, including Village contribution of INR 1.4 million in the form of Shramdan (Voluntary labor). The watershed committee mobilized INR 0.8 million through member contribution to the watershed development fund of the committee. The watershed committee promptly undertakes minor despairs in a timely manner using this fund. The is way most of the structures are in a well-maintained of the project. The involvement of the community right from the initial stages of planning and implementation and the realization of benefits through improved agriculture and horticulture, are the main reasons for the continuing interest of people in maintaining the structures. The strength of people’s participation is evident from the fact that villagers themselves have identified need based works, going beyond the scope of the project. The watershed committee along the villager’s increased the height of one of the check dams pooling resources through voluntary donations this helped in impounding of a higher volume of water and providing assured water for irrigation and domestic use further, the villagers constructed a 42 km road by pooling Financial resources from the community, some of the farmers even donating land for road construction. This road has helped farmers to sell their produce at market yard.

**Results and Impact:** Effects of watershed works become visible from the second year of programme implementation mainly in the form of change in land use by farmers and rise in water level in wells due to soil conservation treatments. In the subsequent years, people experienced significant improvements in productivity and fertility of land, irrigation potential and adoption of new agricultural technologies. Today, Kadwanchi watershed resembles an oasis in the grim and barren landscape of the rest of Jalna district. As many as 300 households in the village have their own farm ponds for capturing and storing rainwater. Interaction with the watershed committee and villagers showed that the watershed development works made good impact the entire micro-watershed. CCT and tree plantation together with a holistic watershed development approach increased availability of water for both domestic use and irrigation. There by providing water security seasonal irrigation was possible on 897 ha land perennial irrigation was possible on 190 ha. There was a dramatic improvement in returns from agriculture in this rain-fed area, according to the assessment of central Research Institute for Dry land Agriculture (CRIDA), Hyderabad. Majority of the farmers are marginal and small/medium farmers. They have adopted all improved package of practices under the technical guidance of KVK scientists. Many farmers now own tractors, power tillers, drip irrigation equipment (294 sets now in use) etc. Area under horticulture increased from 3 hector to 198 hector, with new plantation of new crops like Pomegranate, Gooseberry, Custard Apple and tamarind have coming up and Grape area.

## CHANGE IN LANDUSE PATTERN

Table No.-2

Sr. No.	Particulars under cultivated area	Per-development	Post development
1	Under cultivated area	1365.95 ha	<b>1517 ha</b>
2	Fallow are	147.03 ha	<b>62.03 ha</b>
3	Under Two seasonal irrigation area	398 ha	<b>897 ha</b>
4	Under pereniad Irrigation	174.14 ha	<b>330 ha</b>
5	Under vegetable cultivation	107 ha	<b>257 ha</b>
6	Tractors	2 Nos.	<b>07 Nos.</b>
7	Tractor operated seed drill	Nil	<b>04 Nos.</b>
8	Threshers	02 Nos.	<b>18 Nos.</b>
9	Power sprayers	02 Nos.	<b>150 Nos.</b>
10	Chaff cutters	Nil	<b>07 Nos.</b>
11	Adjustable harrow	Nil	<b>08 Nos.</b>
12	Vaibhav sickle	Nil	<b>110 Nos.</b>
13	Sprinkler irrigation set	02	<b>97 Nos.</b>
14	Drip irrigation set	07	<b>197 Nos.</b>

IGWDP-kadwanchi watershed

Above table no.2 indicate the change in land use is spelled by increase in area under cultivation to 111% seasonally irrigated two crops to 897 ha. Perennial irrigation to 190% vegetables 240% decrease in fallow lands by 58% increase in use of farm implements and 294 micro irrigation sets are in use. Agriculture has shown a new avenue to the people area under coarse cereals is reduced to around half and new crops are introduced like horticulture, ginger etc. the crop yield for pearl millet grams is increased from 199 to 347 and 28 to 99 hectare respectively. Area under horticulture in increased from 3 hectare to 198 hectare.

## CONCLUSIONS

Planning and taking up the task of capacity building of different stakeholders in watershed management is crucial for success of any Natural Resources Development programme. One of the main objectives of Government India is to launch a common approach for watershed Development with active involvement of stakeholders. Farm bunds are better than contour bunds in specific conditions. We can say that the Kadwanchi experiment is replicable in dry land areas with less than 750mm of annual rainfall. Watershed development cannot be complete without soil and water conservation while arresting rainwater runoff, you would get only water but soil and water. The factors that are key drive of success local leadership, balancing community involvement, Strong local leadership, blanching cost limiting the construction of check dams, and the technical support of a change agent. Kadwanchi watershed is an example of participatory integrated resource management and holistic development through involvement of all stakeholders. It shall also create space for more responsive attitude of village community and various governmental and non governmental agencies for similar development initiatives.

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