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A Case Study of Watershed Development Area of Kadwanchi Village

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Abstract:

Water is the life-blood of the environment, without water no living beings can survive. Water is used for agricultural, domestic, industrial, power generation and other various purposes. This paper presents one such case study where large amount of rainwater is possible to direct to recharge ground water resources. This paper summaries observations based on previous assessments of watershed development programme in developing rural village Kadwanchi. Kadwanchi is a small village located at distance of 16 kms from Jalna city in Maharashtra state. Watershed is a basic hydrologic unit and hydrologic and ecologic govern the quality of soil and water resources within watershed. The in-situ conservation measures in the form of field bonding and ex-situ through check dams complemented each other and improved both surface and ground water availability. The watershed is an important source of drinking water. Ideally, a protected watershed can provide water that is pure enough to drink without any additional treatment. To solve the problem of water kadwanchi village in Jalna district watershed has developed through various methods and that's why kadwanchi village has developed overall.

Key words: Watershed, impact assessment, sustainability, Watershed development area, Farm pond, Gully plugs

Introduction:

Marathwada Region, which is mainly located in the main drainage of Godavari River is facing severe drought. Actually, the region is facing the recurrent droughts with constant variations of rains and prolonged gaps. However, the water scarcity this area, especially in Jalna districts is altogether different from the famine of 1972 because we have indiscriminately siphoned the ground water and made no efforts to recharge it. Although, hundreds of tankers are deployed, the major problem is related to the source of water. Many urban areas like Jalna and several townships are facing severe water scarcity.

Watershed is defined as a geo-hydrological unit draining to a common point by a system of drains. All lands on earth are part of one watershed or other. Watershed is thus the land and water area, which contributes runoff to a common point. A watershed can be defined as the drainage basin or catchment area of a particular stream or river. Simply put, it refers to the area from where the water to a particular drainage system, like a river or stream, comes from. Watershed programmes aim at controlling degradation, conservation and development of natural resources and livelihood enhancement of the farmers and landless. Although watershed approach was known since long, it was only in 1983, when ICAR launched the Model Watershed Programme under the aegis of National Watershed Programme this programme focus on development of both arable and non-arable lands. Successes witnessed through model watersheds led to the launching of a National Watershed Development Programme for Rain fed

Areas. Watershed programmes has made significant progress in rain fed regions through increase in productivity, improvement in resource quality, diversification of production systems and generation of additional employment. Watershed programmes resulted in yield increase significantly across the Maharashtra and have shown a potential of 20 to 100% increase in the crop productivity from rain fed areas in addition to improving the natural resource-base and environmental benefits. Further, a majority of researchers agree that there is an increase in cropping intensity, household income, availability of fodder and ground water status as reported by Ralegan Siddhi of Maharashtra, Similarly, a number of studies have reported that economic impact of watershed development programmes accrue in terms of favorable benefit cost ratio

Significance of Watershed Area Delopment :

The problem of drinking water scarcity is growing day by day. One of the main reasons for this is the lack of planning and management of water resources. In agriculture dependent country like India, water plays key role in development of economic growth. Uncertainty in rainfall and poor socio-economic condition of the farmers prevent them from making heavy investments in agriculture. To save the crops from drought during rainy season and to meet the water needs of the post-rainy season crop, farmers resort to groundwater exploitation resulting in recession of groundwater levels due to inadequate groundwater recharging facilities. Present drought situation in Maharashtra is hydrological worse than in 1972. Construction of large dams, water intensive cropping patterns, neglect of local water systems and unaccountable water management are to blame for this unprecedented situation. A former planning commissioner agrees that large dams are not the solution to Maharashtra's water worries. In spite of acute water scarcity, Water business booms in drought-hit Marathwada as tanker owners transact Rs.6 million in water sales daily in Jalna town, Maharashtra.

Objectives

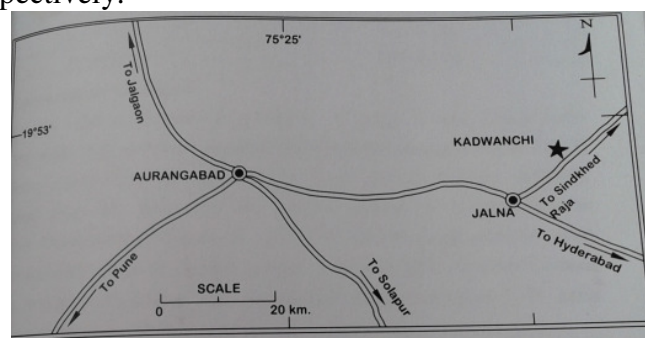
1. To control damaging runoff and degradation and thereby conservation of soil and water.
2. To enhance the ground water recharge.
3. To review the role of watershed area development programmers in solution of water problem

Hypothesis:

1. Through watershed development water scarcity problem has been solved up to great extent.
2. Watershed development helping in rural and agricultural development.

Study Area:

Kadwanchi watershed is situated between latitude $19^{\circ}53'$ N and longitude $76^{\circ}00'$ E of GP-33 watershed of Godavari Purna Watershed in Maharashtra, India. Kadwanchi watershed consists of three villages namely Kadwanchi, Waghrul and Nandapur with area 1607.64, 28.40 and 252.03 hectares respectively.



Methodology

Present research Study primary and secondary sources will be utilized for this watershed area. Secondary data is relied up on various schemes of Central and State rural development ministries report, guide line book, State and District Socio-economic commentaries, reports of various NGO who helping in watershed development, state and district agricultural development offices, guidance of water and agriculture experts, magazines, Articles of newspapers etc. The methodology adopted for the present area includes the collection of data by personal interviews, observation and discussion with local people' Through Questionnaires prepared and getting filled them by people.

Kadwanchi Watershed

Kadwanchi watershed area is bounded in the west, north & east, by a rather crescent shaped hill range, which extends from west to east. The village is located at the foot of the hill range, which runs in north-south direction. Therefore, the entire catchment area of the watershed lies main towards north and west. The total area of watershed is about 1607 Ha. And the Cultivable area lies towards north and south of the village. A major nala has its source in the north and runs towards south and crossing Jalna-Sindkhedraja road. Smaller tributaries feed this major nala. 9 large check dams across the major nala and 9 small check dams across tributaries. In addition to these a number of continuous contour trenches and gully plugs have been constructed at higher reaches. Z.P. Jalna has also constructed one K.T. Weir. The success of watershed led to the improvement in physical assets, individual farm houses and created an exemplary model of construction of internal roads to a length of 42 km by farmers themselves. The present study focuses on ex-post analysis after a gap of one decade to understand the various aspects of sustainability and their drivers for drawing lessons from the success of Kadwanchi watershed in Jalna district of Maharashtra State.

- **Village – Wise Area (ha)**

Description	Kadwanchi	Nandapur	Waghrul	Total
Irrigated cultivated area	167.89	0	0.25	174.14
Non-irrigated cultivated area	1153.65	11.64	28.52	1191.81
TOTAL GEOGRAPHIC AREA	1607.64	28.4	252.03	1888.07

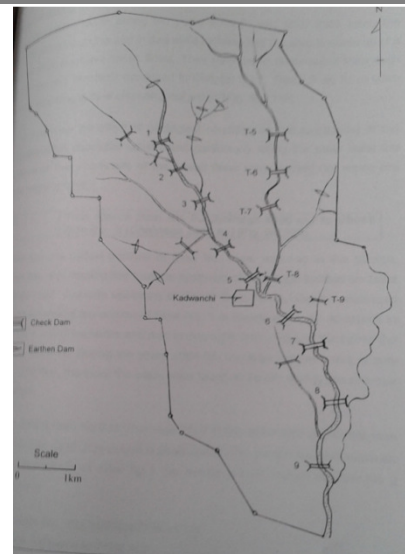
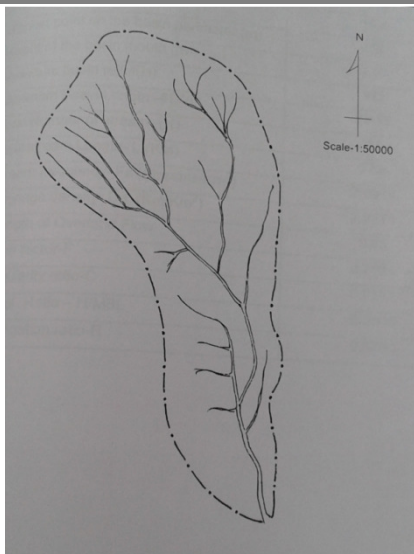
- **Drainage line treatment**

1	Gully plugs	3640 m	4250 Mt	Collecting the loose rubbles and constructed in designed form
2	Gabions	168 m	54 m	Constructed by loose rubbles in mesh wire.
3	Masonry gully plug (check weir)	10 Nos	10 Nos	Constructed in UCR by mason
4	Check dams	09 Nos	09 Nos	Constructed in plumb concrete
5	Repair of Nala Bund	09 Nos	11 Nos	Constructed spill way by U.C.R.

- **Land Use**

Before (1997-98)

After (2011-12)



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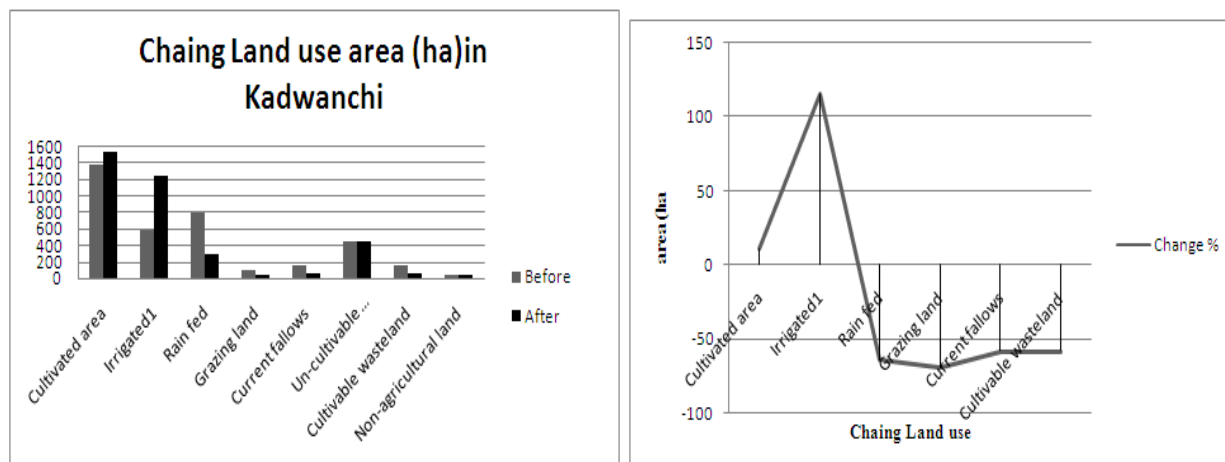
- **Land use pattern before and after the watershed Programme**
 (Area in ha.)

Land use	Before	After	% Change
Cultivated area	1366	1517	11
Irrigated I	572	1227	115
Rain fed	794	290	- 64
Forest area	-	-	-
Grazing land	102	32	- 69
Current fallows	147	62	-58
Un-cultivable wasteland	451	451	-
Cultivable wasteland	147	62	- 58
Non-agricultural land	36	36	-

Source: www.marathwadashetisahayyamandal.com

Impact of watershed programme was felt during second year of inception of programme in terms of change in land use planning by farmers, rise in water level as seen in wells because of soil conservation treatments. During later years of programme, impact was felt in terms of productivity and fertility of land, irrigation potential, adoption of new agricultural technologies regarding farming practices, irrigation, seed, fertilizers, marketing, group farming, and farm machineries. Marathwada Sheti Sahayya Mandal, A non-Government Voluntary Organization initiated extension activities from 1993 in small village Kadwanchi. Under Indo-German Watershed Development Program (IGWDP), the watershed activities have been carried out. 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 Two fold increase in crossbred cows and three-fold decrease in indigenous cows is observed due to increase in fodder availability by 1.5 times. Agriculture has shown a new avenue of small entrepreneurships like dairy industry, small processing units in the village which further spelt out employment to the village personnel's. The crop yield for pearl millet & grams is increased by 150% while area under cotton & wheat is increased from 199 to 347 and 28 to 99 hectare respectively. Area under horticulture is increased from 3 hectare to 198 hectare. As per Ground water Survey and Development Agency report 2007-08 the Kadwanchi is falls in the GP 33

watershed. This watershed fall in Semi-critical category, but Kadwanchi adjoining area 1888.7 of 9238 ha area GP 33 Watershed highly escaped from the water-scarcity, aptly called oasis of the desert.



Conclusion:

Watershed area development can bring about transformation of Kadwanchi village with increased per capita income and certain other measures like developing agro based industries, tourism center, naturopathy etc. by utilizing the available natural resources in best possible manner. Watershed management for Kadwanchi village will render the people self sustaining. This will also help to solve the present problem of overcrowding of the cities. Thus, finally conclude that, economical development of village people possible through watershed development programme. After construction of these structures, 11.35 m.cum. (71% of runoff) water to be recharged. There is satisfying requirement of village people. Also by inter-trading of crop production there is increase in income village people from agricultural activity

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