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IMPACT EVALUATION OF WATERSHED PROGRAMME A CASE STUDY OF KADWANCHI VILLAGE



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ABSTRACT:

This paper highlights the impact of Watershed Development program on ground water, diversification of crops and socio-economic status of the people. Kadwanchi watershed programme in Jalna district of Maharashtra implemented by KVK, Jalna during 1997-2002 covering an area of 1888 hectares was evaluated during 2012 by CRIDA Hyderabad after a gap of 10 years to check the impact of WDP on success and understand the overall sustainability. The soil conservation measures in the form of field bunding and water conservation through check dams correlated to each other and improved both surface and ground water availability. Afterwards this study was conducted during 1st January 2015–31st December 2015 in Kadwanchi watershed, Jalna district of Maharashtra state for impact evaluation of watershed program. This study is limited to Kadwanchi village only. Rainfall in 2014 was 352 mm and only 228 mm in 2015 of this project area. Ground water table improved and also depth of

water in open dug wells enhanced. Area of grapes before 2002 was 3.0 ha which increased to 60 ha. In 2012 and this area of grapes again increased to 280 ha in 2015. There is increasing trends of taking farm ponds. Beneficial and economical effect of programme was noticed an increase in area of grapes and cotton while productivity of grapes and cotton was increased with a change in horticultural area, irrigated area, cropping pattern, water resources. The livestock population was also increased due to sufficient water and fodder availability. Using modern inputs like high yielding varieties, organic fertilizers, micro irrigation systems and plant protection measures etc. productivity of crops increased. The socio economic status of beneficiary farmers is increased. All these indicate that there is a positive impact of watershed development program on the groundwater and irrigation of the area, enhancement in Horticulture crops (grapes).

KEYWORDS : Watershed development programme, cropping pattern, area, sustainability, Groundwater, productivity, check dam, continuous contour trenches.

INTRODUCTION:

In India 70% to 75% of population lives in villages. As India is agro base country, basic source of income for villagers is agricultural production. 66% of country manpower is housed in rural settlements. Prosperity of India will accordingly depend upon how productive this workforce is in the existing scenario. Rainfall in India is uneven, still if managed properly all India will be irrigated. The best example before us is of Israel. Major projects are not good solutions for water crises because that create many problems like rehabilitation, water logging, it disturbs environment. For balanced sustainable development, conservation of soil, water and environment, watershed management is the only solution. Watershed Development Program (WDP) is one of the greatest popular development programs implemented across the country

Watershed is a small catchment area from which all precipitation flows into a single stream. It is a manageable hydrological unit. Watershed management is nothing but management of land, water and energy by managing these resources of people living in that watershed, that is one of the solutions for rural development.

The concept of watershed is essentially adoption of soil and water conservation practices in the watershed. The aims of these practices are proper land use, protecting land against all forms of deterioration, building and maintaining of soil fertility, conserving water from farm use, proper management of local water, for drainage, flood protection, sediment reduction and increasing productivity from all land uses.

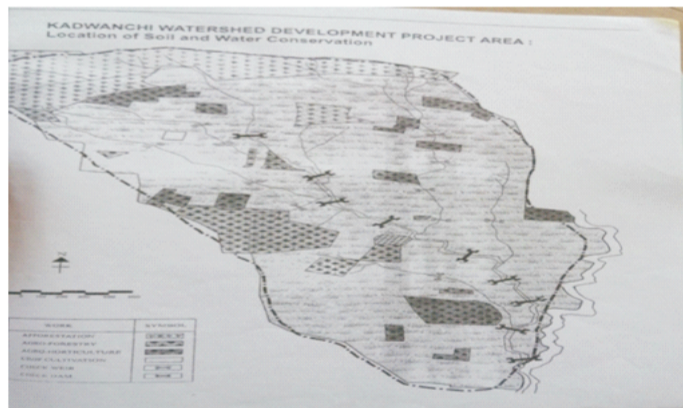
Literature Review:

S. B. Singh et.al. (2010) (6) have studied the impact of khamenlok watershed project on changes in land use pattern, cropping pattern, income employment and equity of the household in the watershed. This study indicated that the watershed project altered the land use system favorably to horticultural crops mostly fruits with little to development of field crops and livestock including fisheries. P.K. Joshi et. al. [9] (2004) they have studied the watershed development in India, they have concluded that peoples participation in planning, implementation and managing watershed activities is very crucial. The studies further revealed that the success of watershed depends on an integrated approach where technologies, market integration, peoples participations are blended. Kailas Vasant Patil et.al [3] (2012) have done basic research for water conservation at Arunavati River and at the southern footage in Shirpur tehsil Dhule District. This project is the vision of Hon. M.L.A Mr.

Amrishbhai Patel (Ex. Youth and Sport Ministry, Maharashtra state) and Dr. Suresh Khanapurkar. The vision of Amrishbhai Patel is come into concert form by the hardwork Dr. Khanapurkar so this pattern is also known as Amrishbhai Patel Pattern all over the Maharashtra. The project office Dr. Khanapurkar is renowned Ex. Geologist of Govt. of Maharashtra. The Shirpur Pattern which was implemented in near about 200 sq km area, 35 villages, 59 dug wells and 36 km small streams with the cost of 15 crore rupees can be re-implemented throughout the whole state with 22 crore rupees and 22 pock lends and seven dumpers for every district of Maharashtra will be SujlamSufnam during the next 10 years. The way of vision of Hon. Amrishbhai Patel and Dr. Suresh Khanapurkar helps to attain a height offix to Shirpur tehsil. Pandurang D. Jankar et al. [4] (2013) studied on "A case study of watershed management for Madgyal village" they shows that GIS is an essential tool for watershed planning and management tasks. Madgyal is a small village located at distance of 25 Kms from Jath city. In the Madgyal watershed area, demand of water for agriculture and drinking purpose is increasing rapidly depleting water resources coupled with overpopulation. To fulfill this demand watershed management technique need to be implemented. Socio- economic survey shows that 76% of people having agricultural land. If watershed development project is implemented then it will result in increase in the living standard and economic condition of the people. Runoff is very important factor. Runoff occurs in nallas/streams. Due to GIS software it is possible to find out stream lines on which the structures are to be planned, slope direction, topography, hills is very important factor and is useful for analysis and decision making in the watershed area. For successful implementation of this project participation of local people, government officers, and funding agencies is required.

Study area:

Kadwanchi village, situated in Jalna district 18 km away from the city, having population of 1,954 and cultivable land of 1,191 ha. The soils are shallow(5-25cm) and undulating and rainfall ranges from 220-1000 mm. Kadwanchi watershed consists of three villages namely Kadwanchi, Wagherul and Nandapur with an area of 1607.64, 28.40 and 252.03 hectares respectively. Kadwanchi watershed is situated between latitude 19° N and longitude 78° E and this study is limited to Kadwanchi village.



Location map of Kadavanchi Village

Methodology:

Kadwanchi watershed is situated between latitude 19° N and longitude 78° E. This study was conducted during 1st Jan. 2015 to 31st Dec. 2015 in Kadwanchi watershed of Jalna district.

1) From the watershed area, a list of 30 beneficiaries having land under watershed area was prepared,

for collecting data in the form of questionnaires.

2) Observations and discussions were arranged with beneficiary farmers:

3) An informal interviews were held with regional farmers to collect data which included questions like:

- a) What is the present cropping pattern?
- b) What is your present income?
- c) Do you have any idea about watershed management?
- d) How much is the yield from the present agricultural activities?
- e) Do you have any farm pond in your field?



Farm pond at Kadwanchi watershed



Farm pond at Kadwanchi watershed

4) Cropping pattern survey: The present cropping pattern and changes in yield due to watershed treatments activities were also collected from field survey. Data thus collected was then analyzed.

5) Socio economic survey consist of farmers income and there personal amenities.

Result and discussion:

Watershed treatments were mainly targeted towards soil conservation and simultaneously treatments towards water conservation. The study also discussed the impacts of these treatments on land and water related benefits to farmers. Out of 30 farmers, 25 farmers said that their uncultivable small land have been converted into cultivable land due to project treatments. The availability of irrigation facility is the major factor in cultivation, more benefits of increased water from surface and ground water availability in the village. These benefits captured by farmers who are having own

irrigation sources (open/bore wells, dug wells or farm ponds). Watershed development program appears to benefit farmers in the study area in terms of groundwater recharge, preventing soil erosion and conservation of water. The impact of watershed treatments measures such as percolation ponds, farm ponds, field bunds, continuous contour trenches, water absorption trenches and check dams on groundwater recharge positively. All of this appears to have contributed to an increase in the area under irrigation and crop diversification. Both the cropping pattern and productivity have undergone changes due to the execution of this watershed project. There is continuous availability of water in the wells. The increase in the yield of crops will definitely enhance the socio-economic status of the people.

Table- Area of horticulture in perennial crop

| Crops | Before WDP in 2001 | | After WDP In 2012 | | After WDP in 2015 | |
|-------------|--------------------|--------------|-------------------|--------------|-------------------|--------------|
| | Area (ha) | Yield (q/ha) | Area (ha) | Yield (q/ha) | Area (ha) | Yield (q/ha) |
| Grapes | 0.2 | 250 | 62 | 250 | 280 | 425 |
| Pomegranate | - | - | 98 | 350 | 40 | 500 |
| Amla | - | - | 11 | 600 | 5 | 750 |
| Total | 0.2 | 250 | 171 | 1200 | 325 | 1675 |

CONCLUSION:

The Kadwanchi watershed is highly successful in various points like water and soil conservation, dependence on irrigation, confidence among the farmers to convert rain fed area into irrigated one. The success of watershed management depends upon good leadership and active public participation and some replication in other areas drives to some key points like transparency in implementation of watershed program, active participation of farmers and improved accesses of both ground and surface water.

There was reduction in soil erosion in the watershed areas. However, the variation in the percentage of reduction primarily depended on quality of soil and moisture conservation activities in the respective regions. Area of horticulture is increasing year to year after WDP also farmers are going for cash crops instead of cereal crops.

The program has significantly increased water availability for irrigation and livestock, soil quality, land productivity and rehabilitation of degraded and extension of arable land. This gives benefit that tremendous increase in Horticulture area (ex. Grapes) and crop productivity.

It was observed that the program is predominately successful in maintaining runoff reduction. In these regions, more waste land was converted for productive use by the farmers. This has resulted in an increase in net sown area in majority of the cases. Further, better land use pattern has helped increase in agricultural yield and thus enhanced agricultural production. In this study area modern and new irrigation systems like sprinkler and drip are adopted and some farmers have adopted net shades and constructed farm ponds (up to 300 numbers) for increase in the agricultural yield. Positive impact of WDP on ground water table and change in cropping pattern is observed.

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