

SUCCESS STORY OF A WATERSHED

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Abstract

This paper highlights the benefits that were brought about by a watershed in a rain fed, dry and backward region of Gujarat. It shows that when watershed is combined with *Wadi* program, the increase in incomes can be 100 percent on an average. The increased incomes were used to buy livestock, thus leading to further prosperity. Migration reduced considerably and all sample families were found to be sending their children to school. Against the cost of Rs. 1,26,00,000, the income benefits matched the construction costs within just a year. Thus investment in watersheds is extremely desirable for semi-arid India.

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Importance of watersheds has been recognized at all levels now – starting from NGOs to State and National governments. As C H Hanumantha Rao states in his article (2000) “The unmistakable impression that one gets from the available information is that the overall impact of the program has been positive and significant”. Over last three decades, there have been many studies highlighting impacts of watershed development (Ninan and Laxmikanthamma (2001), Kerr (1998), Deshpande and Narayanmurthy (1999), Shah (1998))

However, given that watershed performance varies significantly in different agro-climatic conditions, and is highly affected by the capacity and participation level of the local community and also the fact that there are not enough number of studies from different regions to give a comprehensive picture at the national level, we feel that studies from micro regions need to be conducted. This study has been carried out with that purpose.

Dahod is a district on the eastern border of Gujarat. It was carved out of Panchmahal district in 1979. 72% of its population is tribal and 3% is scheduled caste. Only 8% of the

population resides in the urban areas (Census of India, 2001). A study by Amita Shah and Jignasu Yagnik (2007) ranked Dhanpur as the second poorest taluka (with 79.64% of the population living below the poverty line) among top 60 talukas with high BPL ratio in Gujarat. Before 2000, the population was notorious for thefts; there was little law and order in the villages. There were hardly any landless laborers; everyone had some land and still migration levels were high. This is because agriculture productivity was extremely low. Water scarcity was acute. Majority of the population was uneducated. Incomes were so little that any talk of future was considered irrelevant; current survival was all that everyone was striving for.

WATERSHED CONSTRUCTION

Utthan, an NGO working for the downtrodden, entered this region in 1996. Dhanpur was selected because Utthan wanted to work in the poorest and agriculturally most backward region – because help was needed the most there. It started building watersheds there. A major watershed covering about 7000 hectares was started in 2009. Its impact started showing by 2012-13. The agriculture

practices were also sought to be improved to take advantage of the watershed. Training in agriculture practices was carried out in a gender sensitized manner, with the master trainers being women farmers. Each master trainer trained five more women. The goal was to make this area self-reliant.

Before starting the watershed construction, villagers were consulted. The watershed project was to be brought to the village only if the villagers agreed to three conditions: no alcohol, no grazing and no axes (trees cannot be cut). A part of the construction cost was to come through “shramdaan” (donation of labor for construction). Villagers were asked to form watershed committees and self-help groups. Leadership training was organized for the committee members. Capacity building was undertaken for panchayat members too. Camps and awareness campaigns were carried out regarding health and hygiene so that the environment is kept clean after the water availability enhances. Once the institutional foundations were thus made, the construction started. It took them about five years to build the watershed but the water levels started improving in 2-3 years.

Once the watershed construction was successfully underway, Utthan started the Wadi program in partnership with NABARD. It consists of developing a ‘wadi’ as it is called in Gujarati, or a small plot of land of one or two acres with horticultural crops. This program was deemed suitable because horticulture crops do not require a lot of water, but they need protective irrigation. Such irrigation was to come from the watershed. The program was first introduced in the Dangs region of Gujarat. Ajwani (2012) reports that in eight years (1995 to 2002), the program expanded from just over 1000 families to about 13,663 families in Vansda district, Gujarat. The families, by 2004, started earning at least Rs. 30,000-40,000 in a year from a small one acre land. With such successful experiences, Wadi program was identified as a sustainable suitable model for tribal areas by Development Policy Department, NABARD.

Organic farming methods were used for wadi so that the inputs can be generated locally by the farmers; they do not have to buy them from the market. Such an approach saves them from indebtedness, especially in the years following bad monsoons.

In a plot of 0.75 acre, usually 20 mango trees, 16 pear and 8 lemon trees are planted. The seeds, DAP, potash, and such inputs were provided by NABARD. The rest .25 acre of the acre was used for growing vegetable creepers like gourd, bitter gourd, zucchini, snake gourd, etc. Bamboos (that are easily available in Dhanpur) were used for building the support structures for creepers. The creepers grow on the top of the poles; on the land below it, crops like ginger, onions, turmeric and garlic were grown.

When our survey began, the NABARD project was already over. Thus no input supplies come from them. People have started making vegetable seeds at home or they buy them from government shops. They do not need much outside inputs because they practice organic farming.

ABOUT THE SAMPLE FAMILIES

We talked to 63 persons in eight villages of Dhanpur Taluka to understand how the watershed impacted their lives. The villages were Bhovra, Pipodra, Sajoi, Dudhmail, Lukhadia, Agaaswari, Pipero, and Kundawada. The first five of these villages were poor where most houses were kachcha and majority of the adult population was not

educated. The last three villages had many pucca houses and many adults were also educated. Since we were talking about agriculture, mainly the men in the house responded to the questions. 44 of our respondents were men and 19 were women. The average age of the respondents was 49 years. 39 of the respondents were living in the villages where watershed was built and 24 of the respondents had grown “wadi” on their lands.

Ownership of Land among Respondents

54% (34 out of 63) of our respondents were marginal farmers with 0-2.5 acres of land. Only five respondents had middle to large size farms.

FINDINGS

Impact on Agricultural Income

All of the 63 farmers surveyed used to grow maize before the watershed. Another major crop was paddy, grown by 33 out of 63 (52%) farmers. Tur was the third major crop, grown by 26 of 63 farmers (41%). Even now, all the surveyed farmers continue to grow maize and paddy. Almost the same number (28 farmers instead of 26 before) of farmers grows tur too. The major change that has come is the

increase in moisture levels in the soil, ensuring lesser crop failure. Also, farmers have now started using hybrid seeds, knowing that the required water for such seeds is there in the soil. Tur had to be harvested soon after winter set in to ensure that reduced moisture would not lead to drying up of the produce. But this meant not allowing tur to grow to its natural size. Now with increased moisture, they can wait till its natural maturity period gets over. Thus productivity of tur has increased.

Before the watershed, people were able to take only one crop a year. With the watershed, 20 out of 39 farmers (51%) reported that they grow wheat in the winter. This was just not possible before because of lack of soil moisture. Vegetable crops are also taken now in winter. Another indicator of the improvement in soil moisture is that farmers have started growing cotton, which requires more water. From just one out of 39 farmers (2%), now more than 11 (28%) farmers have started growing cotton.

Utthan's presence has helped in improving the cultivation methods also. Paddy is no longer grown by seeds but by transplanting. The distance between crops is kept to the

optimal level. They have learnt to do more inter-cropping combinations than just maize and tur. Moreover, there has also been a significant shift towards organic farming. They feel that this has led to decrease in the crop diseases and increased sustainability of soil.

Many villagers could not articulate how the crop productivity changed with watershed, maybe because they have been getting good returns for about 5-7 years now and hence have forgotten how it was before that. Out of 12 people, who gave a definite answer for productivity increase, five persons (41.6%) reported 50% increase in their crop income. This estimate was based on the increase in productivity levels, which for them was 50%. Three persons (25%) felt that their income increased by 100% or more. The field supervisor, who himself is a farmer in a village there and has benefited from the watershed, explained why the estimate of 100% increase in income could be more accurate. He said that the expenses have gone down. People have learnt better agriculture techniques from Utthan and its partner agencies. Initially, too much urea was applied to the land. Now they know that so much is not needed. There are farmers who have

adopted organic farming. For all of these people, the expenses have decreased and incomes have increased much more due to that.

Those who belonged to the watershed villages and also adopted the concept of “wadi”, reported better results. They are growing cash crops and fruits and vegetables in addition to the basic three crops mentioned above.

Kitchen gardens are also adding to the agriculture produce. People grow chillies, sugarcane, garlic, eggplant, brinjal, jamun, guava, lemon, lady-finger, onion, bottle-gourd, bitter-gourd and tomato. Out of 23 persons who gave a proper reply for increase in agriculture income, 16 (69.5%) said that their income had increased by 100% or more. Another 5 respondents (21.7%) felt that the income increased by 50%. Thus the combination of horticulture crops with watershed seems to have brought in better benefits.

Animal Husbandry

Many villagers have invested their increased incomes in livestock. The project report submitted by Utthan to NABARD reports that overall there is 21% increase in the number of animals owned. The maximum purchase is

that of cross bred cows. Their numbers in the project villages have gone up by 84%. Poultry birds have increased by 33%. About 11-13% increase is noted in the number of buffaloes, bullocks and goats. Utthan introduced Silhori goats that are larger and usually give birth to twins. Thus income from goats also increased with this goat.

With increased productivity, crop refuge has increased, positively affecting the supply of fodder. The bunds constructed for rainwater harvesting are being used for growing fodder. In this way, overall supply of fodder has gone up.

Cost-benefit Analysis of the Watershed

The total cost of the watershed was Rs. 1,26,00,000. About 1128 hectares (2481 acres) were treated with this money. That comes to Rs. 5,078 per acre. The increase in wadi income itself was about Rs 30,000-40,000 per acre per year. Add to that the increase in productivity of other crops on the remaining field that do not have wadi. Kitchen gardens also have been flourishing. This has led to increased nutritional security. The availability of drinking water and the cost saved of collecting water from far needs to be considered too. Increased wealth has brought

in better income from animal husbandry (as discussed in the next paragraph), better houses that save the villagers from natural calamities. When we look at all these benefits the region gets from a well-designed and well-built watershed, the costs seem very little. Even if the maintenance cost per five years is almost the same as the original cost, and was to be spent totally by the government, the returns are far more.

Migration:

Out of 39 families that we talked to, almost all used to migrate before the watershed. Now 18 families (46%) say that they have completely stopped seasonal migration. 21 families (54%) say that some members still migrate, but not all members migrate now. Thus the level of migration seems to be decreasing due to the watershed.

Those who adopted Wadi again show more positive impact. 14 out of 23 families (61%) report that they do not migrate anymore. Seven families (30%) report that the number of family members migrating is less. This finding is in consonance with impact of Wadi reported by other studies.

Irrigation

There was hardly any irrigation in this area before Utthan came. The whole region was very dry. There was water shortage in summers when often enough drinking water was also not available. The increased water level has brought back water in the dry wells. Before the watershed, few people who had borewells, used to get water. Now everyone gets drinking water easily. Everyone has a handpump now.

Irrigation was very less. With watershed, irrigation situation has improved considerably. Table 1 gives the estimate of area irrigated in each village under study:

We found that all our sample farmers had irrigation in Dudhamli and Pipero. Except Bhorva, in all other five villages, protective irrigation was made possible. This enabled the villagers to take two crops in a year instead of just kharif crop.

Education

Out of 461 people of 63 surveyed families, only 165 (35.79%) had received education above 5th standard. We observed that the villages where we found more educated people were also the villages that had more

pucca houses. The direction for causality for such phenomenon could not be established but the correlation seemed to be strong between the two. However, the heartening trend was that all the families surveyed were sending their children to school. No child, male or female, was illiterate in any village. People acknowledged the benefits of education and were very keen on sending their children and grandchildren to schools at least to get primary education. There were students who passed the 12th and were concentrating on government exams for police, army and teachers. On one hand, this reflects awareness about the benefits of education but on the other hand, it also shows that the villagers have reached a level of living where they could think of sending their children to school. They look beyond survival, they now think about future too.

But people complained that there were no jobs in the village for the educated people. People with bachelor's degree were also working only on farm. Only 18 persons (4%) were involved in activities other than farming. Out of these, 6 had shops which is also related to farming. Thus non-farm activities were very low in the villages. The educated hence

always looked towards cities for employment and did not want to remain in the village.

CONCLUSION

The study firmly establishes the desirability of building watersheds. It can give upto 600% returns every year. This is not counting the indirect benefits like reduced migration, increased education and enhanced food security. We would like to emphasize however that the benefits came about because of dedicated work by the NGO, Utthan. The returns would have been much lesser, had the NGO intervention not been there. Quality technical training provided by NABARD also played a very important part.

Watersheds need to be maintained. The silt starts burying the bunds and other constructions after 4-5 years. Usually maintenance funds are included in the watershed budget. The implementing agencies should ensure that the funds are utilized and the structures are maintained. With the return rate so high, even if the maintenance funds had to be provided by the funding agencies, the return on this investment would more than make up for it.

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