



EFFECT OF WATERSHED DEVELOPMENT IN INCOME AND LIVELIHOOD OF THE RESOURCE POOR OF WATERSHED CLUSTER OF WARDHA DISTRICT OF MAHARASHTRA

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Abstract

Watershed development can be looked upon as a means to increase the agricultural production and addressing to the issues of ecological degradation in rainfed and resource poor areas. Also, the watershed approach has the potential to improve the level of living of the poor by providing more sustainable livelihood/employment generation opportunities. A watershed is a natural demarcation of the land, and the appropriate unit for many development activities. Augmented natural resources from watershed development are expected to contribute towards improved livelihood opportunities for all strata and stakeholders. The current study aims on looking on the watershed development programs from a definitive perspective of employment/livelihood generation and thereby creating a progressive difference in the lives of the resource poor. It is widely acknowledge that watershed development programs could be used as an effective means for augmenting income and poverty among the watershed communities. Watershed based development approach has to be vigorously pursued for raising the incomes and standards of living of vast majority of population relying on Rain God for their survival and sustenance.

Watershed development in India

During the pre-independence period, there were certain initiatives to undertake soil and water conservation work has taken. The first attempt was done by the Royal Commission of Agriculture in 1928 which was about the need for afforestation work to be carried out to check erosion in the ravine tracts in the united provinces and stone bunding in the plains of Bombay. However, till independence, no large scale program for soil and water conservation was undertaken on private land except in the Bombay province (Shah, A. 1998). The agricultural development strategy after the independence relied on a program of developing irrigated areas. The interventions in the second and third five-year plans were restricted only to the launching of a few dry-land farming projects. The first attempt to address the problems of drought and desertification in the country was the establishment of a research centre at Jodhpur in 1952 to carry out research on the core needs of desert areas. The first large-scale government supported watershed program was launched in 1962-63 to check siltation in multi-purpose reservoirs as the "Soil Conservation Works in the Catchment of River Valley Projects" (Joshi et. al 2004), efficient and sustainable use of natural resources is necessary for the economic development of agricultural dominated economies like India where two-third of the cropped area is dependent on rainfall. Environment and development are interlinked issues. The degradation of environment increases poverty and reduces the standard of living. About eighty percent of the rural community meets their food, fodder and fuel demands from their local environment and this contribute to an increasing pressure on the fragile biotic eco-system in the absence of adequate and appropriate management to conserve the land and water resources. Hence, watershed can facilitate all planners, managers to consider all inputs, processes and outputs systematically, something essential for a holistic development approach. Such an approach is also logical from the economic point of view. Watershed does not have a definite determining role in shaping the basic economic potential, it also determines which activities will be internally compatible.

Maharashtra has a large drought prone area (52%) and has faced recurrent droughts and famines (1907, 1911, 1918, 1920, 1972 etc.), which generated attention on the improvement of agriculture in non-irrigated areas. There are in all around 44,185 micro watersheds in Maharashtra. According to estimates around 67% of the geographical area requires watershed treatments. Around 26,713 micro watershed programs have been started in the state since 1992 out of which 8,322 have been completed. Regionally, 23% of the programs are in Vidharbha region, 8% in Konkan and 69% are in the drought prone regions of Maharashtra. Rao Hanumantha (2000) interpreted that the overall impact of watershed projects under the Drought Prone Areas Program (DPAP) has been positive and significant. There has been a marked improvement in the access to drinking water in the project areas. Crop yields have risen and there has been a substantial increase in area under cultivation in the rabi season, leading to rise in employment and reduction in migration of labour. Availability of fodder has also improved leading to a rise in the yield of milk. Despite this noticeable improvement in performance, the experience raises a number of important issues which have a bearing on the sustainability of watershed development when the official program comes to an end. Deshpandey & Narayanamoorthy (1999) and Kshirsagaret.al (2003) reported that watershed development programs could be used as an effective means for augmenting income and reducing poverty among the watershed communities. Watershed development can be looked upon as a means to increase the agricultural production and addressing to the issues of ecological degradation in rainfed and resource poor areas. Also, the watershed approach has the potential to improve the level of living of the poor by providing more sustainable livelihood/employment generation opportunities. Hence, the present study has conducted with the objective To study the changes in income, livelihoods and socio-economic conditions of the resource poor.



Research Methodology

The study was conducted in Wardha district of Maharashtra. This watershed was started during the year 2007 under the NABARD Holistic Watershed Development Program (NHWDP) in a phased manner. The respondents were chosen by method of stratified random sampling taking into account the total number of households, population, and different sections of the village community. Wardha district was purposively selected because the program was already implemented in this district. Arvitaluka was selected based on maximum population of resource poor among the six clusters.

Results and Discussions

Table 1- Distribution of the Respondents according to the Changes in Annual Income/Livelihood options:

Sources	Now (%)	Before the Project (%)	Per cent Increase	Reasons for change
Agriculture, including horticulture and vegetable cultivation	65	58	7	Soil and moisture conservation
Dairy	35	12	23	Increased livestock possession
Goat and Sheep Rearing	20	5	15	Increased livestock possession
Poultry	25	7	18	Increased livestock possession
Wage	61	54	7	Increased wage rates and works
Watershed works	24	0	24	Employment in Watershed related works
Self-employment	26	14	12	Due to access to and availability of small loans
Total	100	100		

The data from the Table 1 revealed that major change in income is from the watershed work activities (24 %) followed by the income from dairy (23 %), poultry (18 %), goat and sheep rearing (15 %), self-employment (12 %) respectively, while very less percentage comes from agriculture sector including horticulture and vegetable cultivation (7 %) and an equal increase from wage income (7 %). The results revealed that the major change in the annual income is from the watershed works that are initiated with the initial phase of the project (NHWDP) in 2007. The reasons for the same can be attributed to the sufficient availability of works that are available during the initial years. Most of the respondent population consists of marginal, small farmers and the landless and they were depend on other sources of income for their survival. The availability of watershed works had to benefited upto some extent such resource poor in terms of enhanced wages to those getting from other labour work. The findings also indicates that dairy can be looked upon as a reliable option for additional income generation. Cows/buffalo can be found in almost every household. The resource poor possess this livestock in small numbers and the milk produced out of it is sufficient for their household consumption. Few of the small and semi medium respondents having the livestock in the range 3 to 5 Cows/buffalo are found to derive the additional income from selling the surplus milk, which left after their own consumption.

Another activity contributing to the positive change in annual income of the respondents is poultry. Some of the respondents started poultry after getting financial assistance from NABARD to support the livelihood activities in the watershed area. Due to the increasing demand of poultry birds in the market, it can be looked upon as a good livelihood option for the villagers. But the field interactions with the respondents revealed that there was high risk associated with this activity like diseases in the birds, high maintenance cost and extra care needed for rearing are the major obstacles for carrying out this type of activity on a larger scale. At the very beginning of the project period poultry was done mostly on a household basis, which had 5 to 10 or more birds in the house itself. In majority of the cases was for self consumption. Goat and sheep rearing activity has contributed a lesser amount in the annual income compared to the above discussed activities. The reason for this is that most of the households possess Goat/Sheep in the range of 0 to 5 units and the income from the same does not contribute much. Another reason is that the final product to sell in the market takes 8 months to one year. Also, the kind of risks of losing the livestock due to disease is also another factor of low income due to such activity. Self-employment is the occupation of much less number of people in the villages. The changes in annual income due to this activity are also less compared to others. Sewing machine, carpentry shop, small mobile recharge shop, barber's shop, cobbler, floor-mill, etc., are some of the occupations that found in the watershed cluster. The resource poor were involved mostly in sewing machine (mostly by



women), barber shop, small mobile recharge shop, and small ‘kirana’ (grocery) shops, etc., and have started such activity after the feeling of need for additional source of income for their survival. One of the main reasons for less people involved in the self employment activities can be attributed to the fact that the access to credit is full of procedures which the resource poor found hectic to follow. Also, the lack of technical knowledge/skills is another important reason.

Changes in annual income from the agriculture (including horticulture and vegetable cultivation) activities are also not found much higher as could be expected out of the watershed activities. The reason can be found that most of the farmers belong to the marginal, small, semi-medium pattern of landholdings. So they are unable to derive considerable profits out of it. Also, less availability of improved seeds, less inclination to adopt changing cropping pattern, non-availability of better farm implements, etc., are some of the major reasons for low level of income derived out of agriculture and allied activities for the resource poor. The benefits of watershed from the agriculture (including horticulture and vegetable cultivation) are derived by most of the medium and large landholders due to availability of better irrigation facilities, farm implements, improved quality of seeds and the likewise. The change in annual income due to wage work is found to be minimum as compared to the other activities. The reason for the increase can be attributed to the increased wage rates in recent years. One of the most interesting fact is that the availability of agriculture labour and other works such as building/construction and others has been increased which is in favour of the resource poor. Also, the rates of agricultural labour are increasing day-by-day which gives an increased opportunity to earn income for the resource poor. But the agricultural work is only available in pre harvest and post-harvest season the change in annual income from the same is much less.

Table 2- Distribution of the Respondents according to the Benefits derived by the watershed participants:

S. No	Items	(N= 59)	%
1	Improvement in family living conditions	26	44.06
2	Increased income over previous year	20	33.89
3	Material possession increased	17	28.81
4	Savings increased	19	32.20
5	Soil & water erosion controlled	32	54.23
6	Helped in conserving ground water recharge	34	57.62
7	Cropping intensity increased	9	15.24
8	Yield levels increased	18	30.5
9	Work/employment opportunities increased	48	81.35
10	helped to avail government subsidy/loan	24	40.7
	Total	n=59	100

(n= Total number of respondents)

Benefits of watershed management practices as perceived by the respondents in the watershed cluster are presented in Table 2. The contents of the table revealed that higher percentage of the respondent farmers expressed advantages in work/employment opportunities (81.35 %), followed by (57.62 %) saying that it helped in conserving ground water, while(54.23 %) saying that the watershed helped in soil & water erosion control. Around (44.06 %) of the respondents revealed that the project had an effect in improving the family living conditions followed by respondents who benefited by getting help to avail government subsidy/loan (40.7 %). Further, a medium percentage of the respondents expressed benefits like (33.89 %) saying that it increased income over previous year, increased savings (32.20 %), yield levels increased (30.5 %). A smaller portion of the respondents expressed few benefits like increased material possession (28.81%) and helped in increasing cropping intensity (15.24%).

Majority of the respondents were benefitted from the work/employment opportunities due to watershed activities. The reason could be attributed to increased work availability from watershed related works, increased wage rates for agricultural labour, etc., in recent years. The fact cannot be neglected that after the watershed project the ground water level is found to increase. This is also the reason for the improved agriculture yields which benefited mostly the big farmers. Another benefit out of the watershed expressed by the respondent farmers was the help it has done in soil and water conservation, the reason for the same can be attributed to the watershed works done for addressing the same. Next to this, the benefit of improved living conditions among the households. The reason for the same can be given to the increased income generation (to whatever small extent) which increased household material possessions like TV, mobile, bicycle, farm implements. Other benefit derived by the respondent is in the form of subsidy/loans for livelihood activities and other day-to-day needs like maintenance of their house, gobargas plant for cooking, building toilets in their houses, credit for self employment, etc. Some of the resource poor respondents availed loans/credit facilities under the NHWDP project for the livelihood/income generation activities which benefitted them in increasing their annual income and improving their living conditions. The



other benefits like increased income over the previous year and small amount of savings from their monthly/annual income can also be attributed to the increasing opportunities for work due to watershed and other work available in the nearby vicinity. The increased yields from agriculture activities can also be inferred as a benefit derived due to the increase ground water level and checks on soil and moisture conservation due to the watershed activities undertaken. Also, changing cropping pattern and use of improved variety of seeds is another reason for the same. But the benefits are mostly derived by the medium and large farmers.

Some of the resource poor respondents expressed increase in their material possession. This is attributed to the increase in savings due to increased wage rates from agriculture and other labour work and also to the other income generating activities undertaken by the resource poor respondents. Few respondents expressed their consent to the benefit of change in cropping pattern in agriculture. Most of the resource poor respondents, stated that wheat, gram, paddy, tur dal (Red Gram), soyabean, cotton remains pre dominant crops. But some of them are growing vegetables, horticultural crops , and other cash crops due to the changing trend of cropping. Also, availability of irrigation facilities and increased ground water level are the possible reasons for increasing the level of changing cropping pattern. In this case also, the benefits are mostly derived by the medium and large farmers.

Table 3- Distribution of the Respondents according to the Suggestions offered by the respondents

S. No	Suggestion	Frequency (N=59)	Percentage
1	Financial assistance for maintenance of watershed	23	38.98
2	Need for more employment/livelihood options	47	79.66
3	Increased role in decision making	26	44.06
4	More credit at lower interest rates	32	54.23
5	More participation of women/SC/ST/OBC's/Landless.	45	76.27
	Total	n=59	100

(n= total number of respondents)

Suggestions of the farmers are presented in Table 3 which include need for more employment/livelihood options (79.66 %) followed by more participation of women/SC/ST/OBC's/Landless (76.27 %). Whereas (54.23 %) respondents suggested more credit options should be provided at lower interest rates and (44.06 %)of the respondents suggested the need of increased role in the decision making process regarding watershed activities. About (38.98 %) gave suggestions for provision of more financial assistance for the maintenance of watershed. Majority of the respondents were having the opinion that more employment/livelihood options should be made available. The reason is obvious that the existing opportunities are not sufficient to cater to the livelihood options of the resource poor. The suggestion followed to the previous one is that there should be more participation of women /SC's/ST's/OBC's/landless in the watershed activities and regarding decision making for the overall benefit of the resource poor. The major reason for this is that the watershed is a program which is intended not only for the technical reasons of natural resources conservation but also for the benefit of the resource poor in terms of their socio-economic development/empowerment. Also it can be inferred from the overall results of the study that these resource poor categories are most vulnerable and neglected in the social structure.

The respondents suggesting for more loans at lower interest rates can be attributed to the fact that the resource poor are more vulnerable to shocks/risks involved in starting of any new activity for livelihood/employment generation. Also, the credit/loans provided by the project initiatives for starting income/ livelihood generation area not sufficient to make a successful venture. So the demand for more loans is obvious. As discussed earlier the resource poor respondents should be given more participation is also a valid suggestion which came from many of the respondents. The decision making is a participatory approach and can be done with the involvement of all categories /sections of the population for the benefit of all. Hence this can be a good suggestion and should be looked upon with more attention on part of the implementing agencies and the officials involved. If needed awareness about the same should be generates among the resource poor and the benefits of the same should be conveyed to them. The suggestion by the respondents to have more financial assistance for maintenance of watershed is also a valid one. The implementing agency after the completion of the watershed works gives less attention for the maintenance of such works done. The reason they quote iwas lack of availability of funds to do so. It could be inferred from this that maintenance is also an important factor in the sustainability of the watershed structures and should be dealt with much attention for long lasting effects of the watershed.



Conclusion

Watershed development has been conceived as a strategy for protecting the livelihoods of the people living in the fragile ecosystems experiencing soil degradation and moisture stress. The aim has been to ensure the availability of drinking water, fuel-wood and fodder, also to raise the income level and employment opportunities for marginal farmers and the landless people (**Rao 2000, Paranjape, 1988**). Hence, watershed can facilitate all planners, managers to consider all inputs, processes and outputs systematically, something essential for a holistic development approach. Such an approach is also logical from the economic point of view. Not only does the watershed have a definite determining role in shaping the basic economic potential, it also determines which activities will be internally compatible. It was also found that majority of the households across all the study areas had reported slight improvement in their standard of living. The benefits of WSD have not been fully translated into disposable income or net gains to improve the standard of living. The watershed project has not made a significant impact on improving the socio-economic condition of the resource poor.

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