Impact of Sharda Sahayak Irrigation Project on efficiency of the agricultural sector of the Command Area

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Abstract:
The performance of the Indian economy depends to a large extent on how efficiently and productively various development programs and projects are implemented and how far optimum utilization of the created capacity and resources is insured. Reviews of the performance of the project reveal their success or failure. Most people in India, as in other developing countries. are engaged in agriculture. Irrigation benefits agriculture in numerous ways. Water management activities, particularly irrigation has played a central role in the process of development in our country. Irrigation policy was made more scientific during the Fifth Five Year Plan with the introduction of the Cultivable Command Area (CCA) concept. A programme for integrated development of the command area was launched and the institution of Command Area Development Authority (CADA) was created. This program was called Command Area Development Program (CADP). It was launched in 1974-75 as a centrally sponsored scheme during the Fifth plan for selected major and medium irrigation projects to remove or minimize the various deficiencies in the expeditious and efficient use of irrigation water in the command area and achieve full impact of irrigation on increased agricultural production. The Sharda Sahayak Command area development program was launched in 1967-68 to achieve the objectives of increased utilization of irrigation potential and realization of increased production by managing the waters of the Ghagra-Sharda rivers. The present paper seeks to evaluate the overall impact of the Sharda Sahayak irrigation project on the agriculture sector of the cultivable command area (CCA) of the district covered by the project. It seeks to understand the effect of the project on the cropping pattern, area under various crops, cropping intensity and water use through improved soil and water management practices and techniques. It attempts to identify the shortcomings of the project in these areas and make suggestions for their improvement.

Keywords: irrigation, command area, agriculture potential, cropping pattern.

1. Introduction

Agriculture is the lifeline for a majority in India. Irrigation is vital for agriculture. The steady increase in the production of food grains and cropping pattern would not have been possible without the irrigation sector. Rural development and as a result the development of the country itself is thus directly related to irrigation. We have always accepted its significances and have thus been devoting the major portion of our rural outlay to irrigation.

Development of irrigation potential for increased agricultural production was the main aim of the Command Area Development Project in Uttar Pradesh. The integrated command area development envisaged an efficient use of land and water resources by the launch of multipurpose area development programs under the control of concerned Command Area Development Authority (CADA).

Since its inception in 1974-75 as a centrally sponsored scheme the CADA in Uttar Pradesh had generally undertaken basically target oriented programs like land levelling, construction of field drains,

field channels, water control structures besides other infrastructure facilities. They also engaged themselves in multipurpose program and other diversifying activities in order to maximize the benefits of integrated area development. They were also expected to co-ordinate with other development plans and programs with a view to integrating them in the command area for better forward and backward linkage effects. The Sharda Sahayak Command Area development project was set up with similar broad objective in U.P.

2. The Sharda Sahayak Command Area development project

The Sharda Sahayak command area development project was launched along with the Gandak and Ramganga CADPs to achieve the objective of increased utilization of the irrigation potential and realization of optimum production by utilizing and managing the waters of the Ghagra- Sharda rivers.
The Sharda Sahayak CADP was launched to provide adequate irrigation water to the farmers, particularly at the tail end of the original Sharda Canal system as well as to extend irrigation throughout the Ganga Ghagara Doab by additional supplies of water made available by the construction of a new barrage on the river Ghagra at the outset the original project was meant to provide irrigation water to rabi crops, later it was extended to cover kharif crops as well. At first it provided only protective irrigation, letter it was extended to provide productive irrigation too.

The original Sharda canal system begin to function in 1928 with the culturable Command Area (CCA) of 255 lakhs hectares. The Sharda main Canal take off from river Sharda at Banbasa District, Champawat in the state of Uttarakhand. The Sharda Sahayak project was introduced in 1968 with the objective of irrigating a culturable command area of 16.77 lakhs hectares with 70% irrigation intensity. For this a barrage was built on the river Ghagra in Bahraich district to divert 480 cumecs of water from this river to Sharda and from Sharda 650 cumecs of water would be diverted to 260 km feeds channel from which 5 branches diverted the water to various sub branches and channel of the CCA. These five branches are- Dariyabad branch, Barabanki branch, Haidergarh branch, Raebareily branch, Allahabad (Prayagraj) branch.

The pump canal system of Dohright, Tanda and Raunahi were integrated into the project. With the integration of the pump canal system into the Sharda Sahayak grid, the CCA was intended to be extended to 20 lac hec with an overall irrigation intensity of 96 percent.

At present the Sharda Sahayak project benefits the district of behraich, Kheri, Ambedkar nagar, Azamgarh, Sitapur, Sant ravidas nagar(Bhadohi), Raebareily, Mau, Basti, Pratapgarh, Lucknow, Jaunpur, Barabanki, Faizabad, Ghazipur, Prayagraj, Sultanpur and Varanasi. Total length of the main canal 287.5 km and length of canal branches is 1978 km. The project has at present, a CCA of 1522th.haand potential is1750th.ha. It has a cultivable area of 16.55 lakh hec.

All though the original Sharda Canal system had started providing water for kharif crops along with the rabi crops, it's low design intensity allowed irrigation to be extended to a large number of villages. But it also added pressure on the water resources leading to serve tail-end problems ie the district situated at the other extreme of the canal received very little water. Subsequently the head discharge was increased and a balancing reservoir was provided.

To provide added irrigation facility is the Sharda Sahayak irrigation sysetm was launched in 1967. The project was approved by the state government in 1968.The entire distribution system was proposed to be completed by 1993. The project was ultimately completed in 2000 with escalated costs, though in the process the project under went quite a lot of changes.

The Sharda Sahayak irrigation system was meant to augment and extend irrigation facilities to 16.77 lakh hec. of Cultivable Command Area (CCA) in 15 district viz Lakhimpur khiri, Sultanpur, Jaunpur,

Pratapgarh, Azamgarh, Gazipur, Lucknow, Barabanki, Raebareli, Faizbaad, Sitapur, Ballia, Varanasi and Allahabad. The project had been implemented in their different stages to cover 20 lakh hectares in the Ghaghra- Ganga.

1.Ghaghra –Gomti Doab8.9 lakh hec.
2.Gomti – Sai Doab5.6 lakh hec.
3.Sai – Ganga Doab5.5 lakh hec.

3. Objectives

Almost all irrigation projects have the same basic objectives i.e., to increase utilization of irrigation potential created and to increase cropping intensity of the command area.

4. Significance of the Canal irrigation

Canal irrigation was believed to solve the maximum number of problems of the cultivators. Canal irrigation provided assured water supply on time and in sufficient quantities. Irrigated agriculture involves highly orchestrated planning and implementation of programs and a number of organizations in the public and private sectors. In a command areas various government departments have an integrated and co-ordinated role to play and plan the crop pattern and productivity ahead of each season. This no doubt restricts the freedom of choice of the farmers but in the long run helps the community as a whole to reap the benefits through irrigation in the form of higher yields prevention of soil degradation and finding good market prices.

Thus, an irrigation program facilitates the adoption of improved practices leading to absorption of modern inputs in increasing quantities at the form level and also changes the cropping pattern of the command area. Irrigation is conductive to the use of high yielding variety seeds with require copious watering throughout their growth period. Wherever chemical fertilizers are used availability of adequate water in the extremely essential, as without water chemical fertilizers would cause heavy damage the crops. Irrigation is also essential to the use of pesticides, insecticides and fungicides. Irrigation also provides ample scope for the use of machinery on the farms. It also changes the cropping pattern of the command area leading to the adoption of modern inputs supporting long duration crops and by paving the way for double and multiple cropping.

5. Impact of Sharda Sahayak CADP on agriculture

Sharda Sahayak irrigation project has shown some marked effect on irrigation potential, cropping pattern and crop production in the culturable command area.

6. Irrigated Area

The increase in the overall irrigation potential by the Sharda canal and other sources reflected the beneficial effects of the canal system and the overall water region in the watershed drawing water from the Sharda canal but this was not true for the tail ends. This necessitated considerable development of ground water, although this was concentrated towards the tail ends of the individual sub- commands. The gross irrigated area under the project was 13.70 lakh hectare in 1974-75 which had increased to about 19.25 lakhs hectare by1999-2000. Percentage share of the irrigated land in the operational holdings had increased from 75.94 to 283.77 in the pre project and past project period. Area irrigated by the canal had increased from 121.21m hec.to 7:30m hec. Sharda Sahayak irrigated approximately 47.82% of the irrigated area in the command area, while tube wells irrigated 35.85%.

7. Cultivated Area

An increase in the area of cultivation is expected to result in a corresponding increase in agriculture production provided weather conditions are normal. But the net cultivated area under the Sharda Sahayak command area development project remained almost constant between 1974 -75 and 1987-88 and after. But gross cultivated area increased by around 14.9% in the same period. This was due to the

fact that with the construction of the new canal system as well as irrigation network at the micro level in the command, the availability of the water had increased. This in turn had converted a significant single- cropped area into multi- cropped area. This fact is borne out by figures. The area under crops grown more than once was 7.84 lakh hec in 1974-75 and had increased to 13.04 lakh hec by 1987-88 alone, an increase of 66.3%. This can definitely be regarded as an achievement of the Command Area Authority. Cropping intensity in the command area also rose significantly. But, a study of the area sown under different crops presented an interesting fact.

8. Area Under Different Crops

Since the inception of the Sharda Sahayak Command Area Project**,** there was witnessed a big change in the cultivation of crops, as far as the choice of the crops was concerned. Since irrigation provided adequate and regular water supply, farmers started growing paddy instead of crops which were considered inferior like maize, jwar and barley. This fact is clearly reflected in the following figures.

Comparative Yield of Major Crops in SSP

Crops	**Yield in qtls/ha in 1979-80**	**Yield in qtls/ha in 2003-04**	**Change in Area %**
Wheat	11.89	22.77	-5.24
Paddy	16.00	32.02	43.73
Maize	19.14	15.36	-90.09
Sugarcane	292.38	462.24	10.27
Gram	18.75	18.79	-91.74
Millet	8.73	10.57	-94.76
Arhar	8.97	8.2	-85.62
Mustard	9.84	9.32	63.92

Source: *Report no 198; Evaluation study of Sharda Sahayak Pariyojna- Programe Evaluation Organization, Government of India, New Delhi, May 2007(P-26).*

Thus. although there was a decline in the total land under cultivation between 1974-75 to 2003-04, caused by factors like shift from agricultural to non-agricultural use, fragmentation of land and others, but the area under some crops particularly paddy, sugarcane and mustard increased, while that under gram, millets, jwar, wheat and arhar declined.

An important fact regarding localization of crop area was that while paddy cultivation was concentrated at the head ends of the canal system, the tail enders usually cultivated relatively low input crops almost throughout the year due to water supply and distribution system.

9. Irrigated area of crops

Irrigated area of crops had followed a pattern similar to that exhibited by the area under different crops. The crops which have shown an increase in total area have also shown an increase in irrigated area. Clearly the percentage increase in the irrigated area of crops after the commencement of the project over that before the project in respect of paddy has been much higher than others.

10. Production of crops

Production of crops invariably increase following an increase in the area under cultivation. This does not necessarily imply a corresponding increase in productivity as well. Although in the beginning, the production of the two most important crops- wheat and paddy- had increased by almost 295.4% and 248.5% respectively. but later surprisingly the production of wheat declined. While paddy production increased by 225% and wheat by 200% production of paddy continued to surge. Production of potatoes

also started gaining popularity; its yield increased by 247%. Studies also revealed that across the 16 districts of the command area the average yield per hectare of the four major crops paddy, wheat, gram and peppermint was much higher for the beneficiaries of the canal system. But crop yield declined significantly during water logging. Not only does water logging damage standing crops but it delays the sowing of the next crop too. It also affects the cultivation of the vegetables, leguminous plants and cash crops in the region. Crop diseases rise during water logging.

11. Productivity

The productivity of the crops had generally improved in the command area since the inception of the project. After 1974-75, there was witnessed a general trend of increase in the average yield of the crops in the command area, although this increase was higher at the head-ends compared to the area of the tail-ends. "Irrigation by encouraging greater use of modern input including HYV seeds, leads to diversification of cropping pattern of the command area. This in turn results in an increase of marketable surplus of both cereals and primary raw materials. This sort of marketable surplus is essential for the growth of the economy."- (M.S. Kallur- Irrigation and Economic Development). Distribution of HYV seeds in the Sharda Sahayak CADP had increased continuously since it started. It's use for wheat had increased from 5716.0 to 8138.2 between 1985-86 to 1990-91; while the corresponding figure for paddy 17751.6 to 61301.8 in the same period.

12. Fertilizer Consumption

With an increase in area covered by HYV seeds the consumption of chemical fertilizers had also gone up. The use of chemical fertilizers under the Sharda Sahayak had gone up from 71000 metric tons in 1974-75 to 444200 metric tons in 1990-91.In the pre-canal period only 1.7% of the farmers in the CA used chemical fertilizers and only in very small quantities. In the post- project period till 2003-04, 92% of the farmer were using chemical fertilizers. The use of farmyard manure had declined drastically.

Along with increased use of chemical fertilizers, the farmers had started using pesticides in a significant manner. The use of fungicides had become popular too. More and more farmer had also begun to use weedicides.

Although harvesting practices had not shown much change, post- harvest practices had shown some changes. Most farmer had begun to use threshers instead of the traditional bullocks in the past- harvest operations.

13. Areas of Concern

Although there have been some significant gains from the Sharda Sahayak CADP but there were some very concerning gaps in the implementation of the project.

1. There exists a gab between the irrigation potential created by the Sharda Sahayak CADP and the irrigation potential utilized. As against its claim of having covered 16.74 lakh hectare of CCA, it has been actually not be able to cover more than 11.5 lakh hectare, i.e., 68.7% of the proposed CCA.
2. Heavy siltation was found, which was a major reason for reducing canal capacity. Low canal slope aggravated the problem.
3. Actually, irrigation never reached the designed irrigation level of 1.93 mha.
4. There are four escapes along the Haidergarh- Jaunpur branch canal, but they generally do not function properly due to choking of drains and poor maintenance.
5. With the inception of the system the problem of water logging gradually developed in the command area. In the absence of adequate drainage facilities and low capacity of canals water logging is witnessed in the adjoining areas and fields during monsoons.
6. The problem of seepage also posed a problem in providing a proper distribution system. This again reduces water availability to the tail ends.

7. The feeder channel passes through some sodic patches where they get easily eroded. Also, a large quantity of the sodic soil gets dissolved in the water. It also causes flooding over large areas within the command area.
8. The problem of the water logging and salinity in the system was due to seepage from unlined earthen canals, lack of water management and inadequate drainage system.
9. The minors (kulabas) are ungated, and in the absence of proper water- level control structures and monitoring, farmers often construct temporary earthen bunds to divert the flow of water, further reducing availability of water to the tail ends.
10. Another major problem was availability of insufficient canal water against crop requirement.
11. As water supply in the water system is often unreliable, the farmers at the head- ends practice over irrigation, whenever they get access to water in the canal. This leads to a rise in the ground water levels. The inverse happens at the tail-end farms and they therefore have to take recourse to the use of surface as well as groundwater.
12. The Command Area Development Agency was unable to garner the support of the community in general, and there was an absence of an effective water users' body. This led to the existence of a least participatory irrigation management system.
13. Since the project is entirely owned and executed by the department of Irrigation, it hardly recovers 30 to 40 percent of the operational costs of the system.

14. Conclusion

Since production of crops depends on a variety of factors, it is a complex phenomenon. It does not only depend on soil fertility, rainfall, irrigation, improved seeds, fertilizers and cultivation practices, but also upon the interaction and integration of all these factors. Thus, the Command Area Development Authority has a tremendous responsibility of motivating, advising and guiding farmers. particularly small and marginal farmers, about the benefits of cropping pattern, changing single cropped areas to multiple crop areas, choices of crops, timing of sowing seeds, periodicity of irrigation, use of HYV seeds and fertilizers, along with helping them procure the required inputs from the existing supply agencies and arranging loans for the same. This along with advising them in proper plant protection and gain storage measures, help in strengthen the hands of the farmers.

The Authority and the Department of Irrigation is aware of the problems and are attempting to deal with the same. Lining of water courses are being carried out to reduce wastage of water and address the problem of water logging and seepage in the command area. Induction of heavy doses of water in the canal in some usar land could help leach the salts and reduce the problem of salinity in the area. The policy of developing conjunctive use and improved surface water management, to avoid water logging needs further action. User groups have to be involved in managing water in the system. They may be encouraged to willingly pay for some good services. All withdrawing structures need to be provided with gates to deal with the problem of theft of water. Similarly effective control structures need to be set up along the distributaries. Underutilization of targeted capacity of the project despite the availability of adequate infrastructure is only escalating the running expenses of the system without getting the desired results.

Water quantity and quality should be monitored by the authorities concerned on a periodic basis. Monitoring should include consumption and quality indicators as well as parameters, such as groundwater levels and surface flows. It is imperative to include consultations with local committees in the processes.

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