

Chapter-V

Impact and Achievement of Outcomes

The audit attempted an analysis of impact of the projects and assessment of what the projects achieved. We have discussed the achievement in respect of Irrigation Potential and provision of Drinking water in Chapter-III in detail. The performance of the projects in respect of all aspects including these parameters is discussed below:

5.1 Irrigation Potential

The main deliverable of an irrigation project is the creation and utilisation of contemplated IP. Targets were set in each project for creation of IP. Achievement of these targets were crucial for meeting the overall objectives of projects. However, audit observed that four projects could not create any IP and only seven projects achieved the targeted IP creation in full. In respect of utilisation of IP created, no IP created could be utilised in three projects while in other projects the utilisation ranged between 2.28 *per cent* to 68.21 *per cent* (*paragraph 3.5.1*).

Bhaisa Singh project was executed for both irrigation and drinking water purpose and planned IP for this project was 350 *ha*. However, despite completion of the dam work, no IP could be created and Bhaisa Singh Dam was handed over (October 2016) to PHED for drinking water facilities. Thus, the initial planning to create 350 *ha* IP could not be achieved at all.

5.2 Drinking Water

National Water Policy stipulates that water resource development projects should as far as possible be planned and developed as multi-purpose projects, with the provision for drinking water. The project wise details about drinking water facility envisaged in DPRs and actually provided are given in **Table 3.6**. Audit observed that only in three out of seven projects, drinking water was provided to intended beneficiaries. No water was provided to beneficiaries in respect of one project and only a part of beneficiaries were covered in respect of other three projects (*paragraph 3.5.3*).

5.3 Achieving Diversity in Cropping Pattern

The cropping pattern in the projects was decided by considering various parameters like: water availability, existing cropping under cultivation, climatic conditions, nature of soil, groundwater conditions, newly introduced modern farming techniques, studies and researches. The viability of a project was decided on the basis of data of cropping pattern and projected yield of crops by WRD.

Depending upon the quality of soil and availability of water, cropping pattern in entire command area should be prescribed on the recommendations of

Agriculture Department. Under the prescribed pattern, some crops may be less water intensive and some may be more water intensive. Accordingly, water was being envisioned to be drawn from the source. Audit however observed that no special efforts were taken to make farmers aware about the benefit of diversity of cropping pattern and how water could be used optimally. Thus, in most cases farmers continued to use the traditional cropping patterns

Audit observed that the Agriculture Department did not ensure the actual cropping pattern as per projections. The actual cropping pattern under the command area of selected projects was different than that proposed in DPR in terms of variety of crops and cultivable area. Scrutiny of records revealed that:

(i) Cropping pattern of NCP had been proposed (by Agriculture Department) separately for Flow (Ned/Normal) and Lift areas. The main consideration for allocation of percentage area for different crops included crop which had low water requirement, higher economic returns and tolerant to salinity. Details of actual cropping pattern was not provided by the department.

(ii) In Piplad, the cropping pattern proposed in DPR was not followed by the cultivators due to lack of awareness about projected cropping pattern. This could be seen from the fact that the mustard was proposed in 32.66 *per cent* CCA and against this cultivator sown it only in 10.88 *per cent* area. Similarly, the crops which were not taken in proposed cropping pattern were sown in 18.63 *per cent* area. Further, the projected yield could also not be achieved as the yield of wheat, gram, mustard and coriander was 34.13, 8.74, 12.08 and 9 quintals/ha against anticipated 40, 17.5, 20 and 13 quintals/ha respectively. In Joint physical survey with departmental authorities, it was noticed that cultivators were not aware about the proposed cropping pattern and no training/guidance about cropping pattern/ technology/upgraded seeds etc. was provided by Agriculture Department or WRD.

(iii) In Do Nadi, cropping pattern was different in terms of area sown and type of crops from that proposed in DPR.

(iv) In Gulendi, cropping pattern was different in terms of area sown and type of crops from that proposed in DPR.

(v) In Kishanpura Lift Project, the cropping pattern actually adopted by cultivators was different from that proposed in the DPR. Cultivators sown coriander and garlic in 28.72 *per cent* area which was not proposed in the DPR. Further, wheat was sown in 355 ha against proposed 194 ha whereas the mustard was sown in 129 ha only against 388 ha. Joint physical survey with departmental authorities, revealed that cultivators were not aware about proposed cropping pattern and no training/guidance about cropping pattern/ technology/upgraded seeds etc. was provided by Agriculture Department or WRD.

In response to sub paras (i) to (v), State Government stated (March 2021) that selection of crop was done by cultivators themselves. Reply was not tenable as no efforts were made to make the cultivators aware about cropping pattern proposed in DPR and the benefits it entails.

5.4 Ecological and Environmental Preservation

According to National Water Policy, in the planning, implementation and operation of projects, preservation of the quality of environment and ecological balance should be a primary consideration. Section 2 of the Forest (Conservation) Act, 1980 provides that State Government shall not make, except with prior approval of the Central Government, any order directing that any forest land or any portion thereof may be used for any non-forest purposes. The development of irrigation project impacts adversely the environment of the area due to construction of reservoirs and submergence of land, displacement of inhabitants including the flora and fauna; resettlement in the surrounding catchment; denudation of forest; water logging and salinity and alkalinity of soil & water etc.

Audit noticed that in most minor and medium irrigation projects neither environmental issues were discussed in the DPRs/Administrative Estimates nor any separate environmental study of impact was carried out.

The environmental study of major irrigation project, NCP was however, carried out by Water and Power Consultancy Services Limited (WAPCOS) (1998), which suggested pressure irrigation by using sprinkler/drip irrigation system in the entire command area to prevent water logging & salinity, and plantation along canal. Tahal consultant prepared (2004) the comprehensive command area development plan, which also suggested pressure irrigation through sprinklers and method of *diggies*. It was, however, observed that after construction of the canal, water logging and salinity in command area had increased.

State Government stated (March 2021) that the problems of water logging and salinization have not occurred in NCP command area. Reply is not tenable because as per reports of WAPCOS and State Ground Water Department, water logging and salinity have occurred in some villages of command area of the project.

5.5 Achievement of plantation target

To prevent water logging in the command area, one of the measures to be adopted was planting of trees along the canal system.

In NCP, a provision of ₹ 55.13 crore for plantation along canal side was made in the DPR (2017). Against the provision, an amount of ₹ 9.57 crore was allotted to Deputy Conservator of Forest (DCF), Barmer and ₹ 37.46 crore to DCF Jalore during the period December 2010 and January 2016. Against the allotted amount, ₹ 6.42 crore and ₹ 20.55 crore respectively were utilized for plantation. The physical targets for plantation along the main canal, distributaries and minors were fixed (July 2011) as 3941 running kms. Against this, the plantation was done in only 2561 running kms (65 *per cent*) up to March 2020. Moreover, the plantation was done for the species other than the species mentioned in the project report.

State Government stated (March 2021) that plantation work was being carried out by the Forest Department. Reply is not tenable as due to lesser plantation and planting of species other than those mentioned in project report, the objective of providing bio-drainage in the command area was defeated.

5.6 Benefit Cost Ratio

The Benefit Cost Ratio (BCR) is the ratio between the annual additional benefit on account of irrigation to the annual cost of providing those benefits. The minimum BCR for approval of such projects in Drought Prone Areas was one and in other areas 1.5.

Details of project wise IP targeted, created and utilised has been discussed in para 3.6.1. Further, details of BCR and economic benefits of three projects out of eight projects are given in **Table 5.1**.

Table 5.1: BCR Details

S.No.	Name of Project	Audit observations
1.	Narmada Canal Project	<p>The department calculated BCR 1.61:1 by taking the gross value of produce for <i>rabi</i> and <i>kharif</i> crops. However, water was provided only for <i>rabi</i> crops. The net value of agriculture produce for the crops estimated during the <i>kharif</i> was ₹ 271.57 crore. However, water was not released during <i>kharif</i>. Hence, farmers lost the opportunity of earning income of ₹ 271.57 crore every year since 2014-15.</p> <p>State Government stated (March 2021) that the water was used for both Rabi and <i>kharif</i> crops. Reply is not tenable as water was provided only for <i>rabi</i> season.</p>
2	Akoli Project	<p>As per revised DPR (2018), the BCR was evaluated as 2.51:1. However, no water was stored in the dam during the years 2018 and 2019. As irrigation was not provided during <i>rabi</i> season, the cultivators lost the opportunity of earning income of ₹ 246.85 lakh every year since 2017-18.</p> <p>State Government stated (March 2021) that there was scattered rain fall in its catchment during 2018 and 2019 so cultivators could not be benefited. Reply is not tenable as the BCR could not be achieved.</p>
3	Gulendi Project	<p>As per revised DPR (2008), the BCR was evaluated as 1.64:1. As water for irrigation was not provided during <i>kharif</i> season, cultivators lost the opportunity of earning income of ₹ 203.74 lakhs every year since 2012-13.</p> <p>State Government stated (March 2021) that water was not provided due to absence of demand from the cultivators in <i>kharif</i> due to sufficient rain fall. This shows that proper demand based on rainfall pattern of the area was not assessed.</p>

5.7 Lack of mechanism to monitor outcomes

Either the information in the desired form was not maintained by the department or available information was not made available to audit. Key information such as preliminary survey records, data in respect of ground water and revenue for the period prior to DPR and project specific crop yield were not provided to audit. In the absence of availability of data and desired records with Department, audit could not ascertain the project-wise comprehensive outcome precisely (*paragraph 2.6*).

Further, coordination among the line departments was not ensured to monitor the progress of projects. Detailed guidelines for planning, execution and monitoring the projects were not developed, there was no joint monitoring mechanism for all ongoing and future irrigation projects, maintenance of data for effective monitoring of the project outcomes was not ensured by nodal officers and WRD failed to monitor the release of water from canal. Thus, due to these constraints and lack of mechanism in the Government to monitor outcomes, the outcomes could not be assessed in audit.

5.8 Summary of findings

Audit observed that neither environmental issues were discussed in DPRs/Administrative Estimates nor any separate environmental study of impact was carried out. In case of NCP, after construction of the canal, water logging and salinity in command area had increased. Only 65 *per cent* physical targets for plantation along the main canal, distributaries and minors were achieved and the plantation was done for the species other than the species mentioned in the project report. Agriculture Department did not ensure the actual cropping pattern as per projections as the actual cropping pattern under the command area of selected projects was different than that proposed in DPR in terms of variety of crops and cultivable area. There were also lack of mechanism to monitor the outcomes.

5.9 Recommendations

- *Department should ensure consideration of environmental issues in DPRs/Administrative estimates.*
- *Department should make efforts to achieve the targets of plantations and ensure the plantation for the species given in project reports.*
- *Department should ensure adoption of project specific cropping pattern.*
- *Nodal Department (WRD) should ensure maintenance of project-wise data required for effective monitoring of the project outcomes.*
- *Department/State Government should evolve suitable mechanism to monitor the outcomes to ensure the effectiveness of the deployed resources.*