

Chapter-III

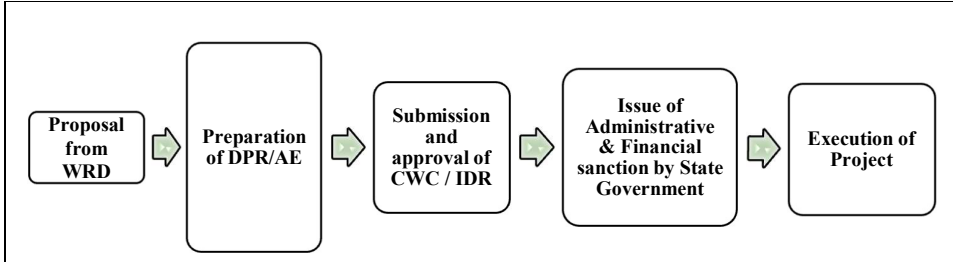
Planning, Execution and Financial Management of Irrigation Projects

Irrigation projects are essentially long term projects and involve huge investment not only in terms of financial resources but also as regards technicalities of work execution, maintenance plan and monitoring systems. The planning of the project depends on various factors including the outcomes intended, stakeholders involved, the geographical location of the project etc.

While enhancement of irrigation potential (IP) was a common objective for all irrigation projects, there were various other sub objectives included in the plans. Some of the projects had provision for supply of drinking water to villages and towns also in their plans. Out of the selected projects Narmada, Lhasi, Piplad, Rajgarh, Do Nadi, Bhaisa Singh and Gulendi Projects were executed for both irrigation and drinking water purposes. The remaining projects viz. Akoli, Ghat Pick up Weir, Kishanpura, Mamtori and Rohini Projects were developed solely for irrigation purpose.

Irrigation projects planning process generally includes a proposal from WRD, preparation of Detailed Project Report (DPR) ¹/Administrative Estimate, scrutiny of major and medium projects' DPR by Central Water Committee (CWC) for determining the techno-economic viability of the project, issue of administrative and financial sanction for the project by State Government after clearance of project from CWC. Minor irrigation projects were approved by Investigation, Design and Research (ID&R) Unit of State Water Resources Planning Department. The process flow chart for the same is given below:

Process flow chart showing summary of Irrigation Projects Planning Process



In all selected projects, funds were provided through the regular budget of the department under various Central/State schemes. This was followed by planning the work execution and establishing the monitoring system. A

¹ The DPR/Administrative Estimate contains the detailed justification of the project, area affected by it, steps involved in execution, estimated cost and benefits etc. During finalization of DPR, feedback/comments were also taken from other stakeholder line departments like Agriculture and Public Health Engineering Department. DPR preparation was to be followed by land acquisition and taking statutory clearances like environment and forest. This has to be initiated by nodal department (WRD).

successful execution of project and effective delivery of outcome required detailed planning at each stage of project.

3.1 Deficiencies in Planning of Projects

Preparation of Detailed Project Report (DPR) includes data of surveys, geological investigations, seismic investigation, hydrology, design etc. and these DPRs were approved by CWC (Major and Medium Projects). Typically, preparation of Administrative Estimates for Minor Irrigation Projects was done departmentally.

During audit, we noticed several basic planning deficiencies which had a cascading effect on completion of projects and led to time and cost over- run. The details are as follows:

3.1.1 Deficiencies in Preparation of DPR

As per CWC Guidelines for submission, appraisal and clearance of irrigation and multipurpose projects, DPRs submitted by State Government are subjected to techno-economic scrutiny by CWC. Block-wise information on command area, conjunctive use of ground water, participatory irrigation management, benefits other than irrigation (like pisciculture, tourism etc.) are also required to be furnished for each project.

Survey was an important tool to assess the requirements of the project and had to be completed before commencement of work. If a survey is not done accurately, it can lead to change in design at the execution stage, delay in completion of the project and increase in cost.

Rule 285 of PWF&AR stipulates that after working out all technical and working details and on completion of surveys and investigation, formulation of working drawing/designs, detailed technical estimates should be done and got sanctioned.

During audit, following deficiencies were noticed in preparation of DPRs and conducting surveys:

(i) As mentioned in para 2.6, data in respect of preliminary surveys conducted for preparing the proposals were not provided to Audit. Thus, in absence of key details, specific deficiencies could not be pointed out in audit. However, in all the selected projects, Audit noticed changes in quantities of items, modifications in scope of work and structural engineering and designs after commencement of work with significant financial implication. Hence, audit is of the view that preliminary surveys were either not conducted or not conducted properly leading to revisions in costs of the selected projects as detailed in **Table 3.3**.

For instance, in case of Narmada Canal Project (NCP) initially the cost was sanctioned (March 1996) as ₹ 467.53 crore, which was revised to ₹ 3,124 crore i.e. increased by 568 *per cent* of initial cost, due to modifications proposed in the project. Pisciculture benefits from these projects were neither ascertained

nor taken into consideration in planning, although fisheries potential was seen in Piplad, Lhasi and Gulendi.

State Government stated (March 2021) that the project cost of NCP was revised to ₹ 1,541.36 crore in August 2007 due to introduction of pressure irrigation technique due to which the irrigated area increased from 1.35 Lakh ha to 2.46 lakh ha. Further, the original proposal was for intensive irrigation which was changed to extensive irrigation. Hence, the increase in cost was only by ₹ 1,582.64 crore i.e. only 102.68 *per cent* instead of 568 *per cent*. Reply is not tenable as initially the cost was sanctioned as ₹ 467.53 crore and later due to changes in the project, the cost was increased by 568 *per cent*.

(ii) Deficiencies in planning were also seen in Lhasi and Rajgarh projects as project proposals did not include provision of water course/field channel which was essential component of any irrigation project. Lack of planning of water course/field channel has resulted in non-execution of these works in respective projects.

State Government stated (March 2021) that in Rajgarh project, the construction of water Course and on-field development activities were conducted by the Command Area Development Department. The fact, however, remains that water course and field development activities were not executed till now. Consequently, the intended benefits could not be achieved.

(iii) In NCP, it was noticed that the construction of Surachand minor of Bhimguda Distributary was completed in September 2011. The Cultivable Command Area (CCA) proposed for the minor was 6,369.31 ha and 51 *diggies*² in the command area were to be constructed.

During the period May 2011 to January 2012, Department found that 3,391.04 ha of CCA to be covered by 25 *diggies* were under government *padat* land³. *Padat* land in command area was not suitable for developing of network for irrigation purposes. Consequently, 25 *diggies* were removed from the umbrella of CCA. In the remaining CCA of 2,978.27 ha, the work of laying of pipeline, installation of pump set and construction of remaining 26 *diggies* was executed (May 2015), with a delay of 320 days due to inaccurate survey and consequential revision in drawing and design.

State Government stated (March 2021) that the area of 25 *diggies* was lying either under forest land or was saline. The reply confirms the audit contention that proper survey was not done during the period of planning and owing to this, project was delayed.

3.1.2 Planning for land acquisition and clearances

For any project of this magnitude, land acquisition is one of the major steps. According to section 4 to 11A of Land Acquisition Act, 1894, whenever, it appears to the appropriate Government that land in any area is required or likely

² Water Storage tank.

³ *Padat* land- un-cultivated or fallow land.

to be required for any public purpose, a notification to that effect along with details of the land to be acquired in rural and urban areas shall be published. Further, as per Rule 298 of the Public Works Financial & Accounts Rules, where land has to be acquired for a particular work, a notification for the acquisition of the land under Land Acquisition Act should invariably be issued before the administrative approval is given.

Delay in land acquisition and transfer of land in the name of department can lead to delays and litigation at the later stage. Cases noticed in audit are detailed below:

(i) Delay in acquisition of land

Scrutiny of records revealed that Administrative and Financial (A&F) sanctions of Akoli, Rajgarh, Piplad, Lhasi and NCP irrigation projects were accorded during the years 1996 to 2011. However, the department delayed acquisition of land from 3 to 19 years from date of issue of A&F sanctions. For example, in Piplad Medium Irrigation Project, A&F sanction was issued in August 2006, however, payment of land acquisition was made, after a delay of 11 years, in May 2017. This resulted in avoidable expenditure of ₹ 33.62 crore due to payment to land holders at increased rates as per new Act⁴. Details of avoidable expenditure due to delay in land acquisition are given in **Appendix-II**. Audit sought the reasons for delay in acquisition of land, however, reasons for same, were not made available to audit. Further, no reasons were found on record relating to the delayed process of land acquisition.

State Government stated (March 2021) that in respect of Lhasi, the land compensation was made for canals, which were sanctioned in the year 2017. Reply was not tenable as the project was sanctioned in the year 2007 and DPR of the project had provision of land acquisition for canal works. However, department acquired land after ten years for canal.

In respect of Rajgarh, it was stated that final awards were prepared and issued as per provisions of new Act. Reply is not tenable as the compensation of land should have been awarded before the new Act came in force as A & F of the project was approved in September 2012.

In respect of NCP it stated that the land for a particular canal is acquired only after detailed survey and L-section of the canal was got approved. Land compensation is paid as per rates approved in the award sanctioned by the competent authority. Reply is not acceptable as A&F of the work was accorded in the years 1996 & 2010 and payment was made in the year 2015, up to which new land acquisition act came in force which led to avoidable expenditure.

For Akoli it was stated that there had been no delay in land acquisition and all procedural steps to acquire land were adopted but rates were changed. Reply is

⁴ Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, effective from 1 April 2014.

not acceptable as A&F of the work was accorded in the year 2011 and payment was made in the year 2015 which led to avoidable expenditure.

(ii) Non-mutation of land

Scrutiny of records of selected projects revealed that the department had acquired land for construction of dam, canal/ distributaries/ minors/ sub-minors. However, mutation of all the acquired land in the name of the department had not been executed as per details given in **Table 3.1**.

Table 3.1: Non-mutation of Land

S. No.	Name of Project	Area of land acquired (in ha)	Mutation of Land (in ha)
1	Narmada Canal Project	4,830	Nil
2	Lhasi	646.96	604.57
3	Piplad	800	215
4	Ghat Pick Up Weir	4.00	Nil
5	Kishanpura Lift	0.05	Nil
6	Do Nadi	28.53	Nil

Thus, in absence of mutation, department had not obtained clear title of the acquired land. State Government stated (March 2021) that efforts are being made for mutation.

(iii) Incorrect certification regarding non-involvement of forest land

The Rohini Minor Irrigation Project was initially sanctioned (July 1999), based on a certificate to the effect that no forest land was involved. However, it was noticed that project had 4.32 ha forest land. Subsequently, department applied (December 2004) for forest clearance in the submergence area. The forest clearance was received in December 2007. The revised Administrative & Financial (A&F) approvals were received in July 2011. The work was finally completed in October 2013. Thus, sanctioning of project based on incorrect certification regarding non-involvement of forest land has delayed the project from July 1999 till receipt of forest clearance (December 2007).

State Government accepted that the project got delayed due to delay in forest clearance and delay in revision of A&F.

3.2 Time overrun of Projects

Timely completion of any project involving public money is crucial for success of project. This is more so for projects directly affecting food production and development of an area. Delays can not only deprive the intended beneficiaries but also result in increased cost to public exchequer. Delays can also add to the complexities of project as project parameters can change with passage of time.

None of the selected projects was completed within stipulated time period. Out of the 12 projects it was found that eight projects had been completed with delays ranging from three to 12 years and four projects were not yet completed, even after a period ranging from six to 39 years. The time overrun in respect of selected projects is depicted in **Chart 2** below:

Chart 2: Time overrun of selected Projects



Table 3.2: Statement showing the detail of time over-run in projects as on 31 March 2020

S. No.	Name of Project	Date of Commencement	Schedule completion	Actual completion	Time Over-run (in Years)	Reasons for delay
1	Narmada Canal Project	March 1996	March 2003	WIP	17	Non award of civil work and mechanical work simultaneously.
2	Lhasi Medium Project	May 2007	May 2013	WIP	07	Delay in land acquisition, change in design, non-awarding of canal works simultaneously with dam work.
3	Piplad Medium Project	August 2006	June 2011	December 2018	07	Delay in land acquisition, non-awarding of canal works simultaneously with dam work.
4	Rajgarh Medium Project	June 2012	June 2015	WIP	05	Non-awarding of canal works simultaneously with dam work, delay in land acquisition.
5	Akoli MIP	December 2011	March 2014	September 2017	03	Change in drawing and design of dam, delay in sanction of extra excess works.
6	Bhaisa singh MIP	October 1978	January 1981	WIP	39	Acquisition of land by RIICO and non-construction of canal
7	Do-nadi MIP	September 1996	March 1999	June 2010	11	Dispute with contractor, inadequate allotment of funds and interruption in works by Forest Department.

S. No.	Name of Project	Date of Commencement	Schedule completion	Actual completion	Time Over-run (in Years)	Reasons for delay
8	Ghat Pick UP MIP	September 2007	March 2010	April 2014	04	Delay in finalisation of drawing and design.
9	Gulendi MIP	November 2000	December 2004	November 2011	07	Delay in land acquisition, dispute with contractor and change in design.
10	Kishanpura Lift MIP	July 1999	July 2000	February 2012	12	Delay in finalisation of drawing and design, non-award of civil work and mechanical work simultaneously.
11	Mamtori MIP	August 2008	March 2011	February 2019	08	Delay in starting of work, dispute with Forest Department.
12	Rohini MIP	July 1999	March 2003	October 2013	10	Delay in Forest clearance.

Major reasons that led to delay in completion and consequent time overrun included planning deficiencies such as delay in finalization of design of dam, non-awarding the canal work simultaneously with dam work, lack of coordination between civil and mechanical work etc. In some cases, CCA could not be created in time due to delay in land acquisition, dispute with contractors and inadequate allotment of fund.

State Government accepted the facts (March 2021).

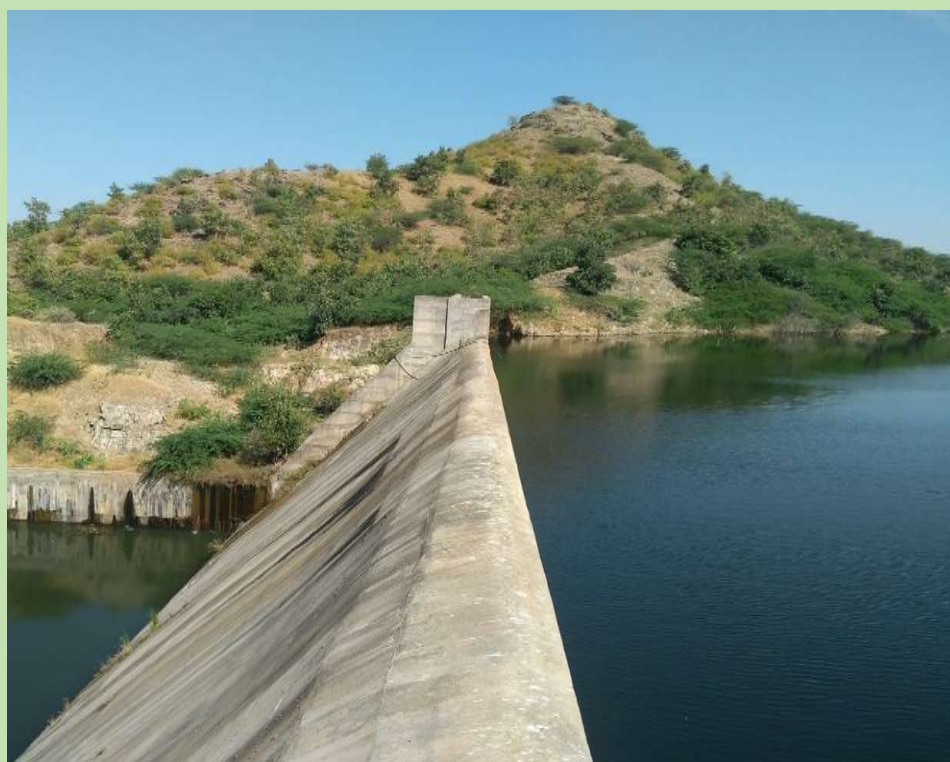
During our audit we came across a case of Bhaisa Singh Irrigation Project where the project continued to be executed for 42 years and yet no outcome could be achieved. Details are given in the case study below:

Case Study- Bhaisa Singh Irrigation Project

An administrative sanction amounting to ₹ 0.50 crore was issued (1978) under Tribal Area Development, for construction of a dam near village Bhaisa Singh in Tehsil Abu Road for irrigation purpose with water storage capacity of 216 Mcft. The project was executed for both irrigation purpose with planned IP of 350 ha and provision of drinking water.

Contracts for construction of dam, were executed in the year 1978-79. The work was to be completed in the year 1981. However, the work was left incomplete in the year 1979-80 by the contractor due to dispute between Contractor and department. Subsequently, due to acquisition of 931 acre land by Rajasthan State Industrial Development & Investment Corporation (RIICO) from total command area of 2,095 acre and additional provision of drinking water for Abu Road town, a revised administrative approval of ₹ 8.23 crore was accorded (2001). There was a part of forest land coming under submergence, however the work was started in the year 2002 without clearance under the Forest (Conservation) Act, 1980. This resulted in suspension of the work in the month of March 2003. Finally, Government applied for environment clearance (February 2006) and got the same in December 2008. Meanwhile, Hydrology of the dam was revised by WRD and revised administrative sanction of ₹ 18.18 crore was accorded (December 2010) by the State Government.

The dam was completed in June 2014 at a cost of ₹ 15.12 crore. No irrigation facility could be achieved from the dam due to reduction in command area as RIICO acquired approximately 45 per cent of land required and canals were not constructed. After two years of the completion of dam, it was decided to hand over the project to PHED for providing drinking water to Abu Road Town (October 2016). However, water supply to Abu Road Town was not started till March 2020. On enquiry, the executive agency Rajasthan Urban Infrastructure Development Project replied (January 2021) that work order was issued for water supply and distribution network improvement and work would be completed in the year 2024. Thus, neither irrigation facility nor drinking water facility could be provided (March 2020) though the work was taken up 42 years ago. Further, an investment of ₹ 15.12 crore along with efforts of various agencies for more than four decades came to a naught and the intended outcomes could not be achieved till date. The State Government accepted the facts (March 2021).



Dam of Bhaisa Singh Irrigation Project

3.3 Cost overrun

For any major project involving public money, keeping the expenditure under budgeted amount is one of the major challenges before project management. In a complex irrigation project, inadequacies in planning or inefficiencies in execution can lead to manifold increase in costs and in turn, can even create an obstacle in completion of project. For all these irrigation projects, the project cost was estimated in DPR and accordingly funds were provided in the departmental budget on yearly basis. The details of project cost in the selected projects were as given in **Table 3.3**.

Table 3.3: Details of cost of the Projects

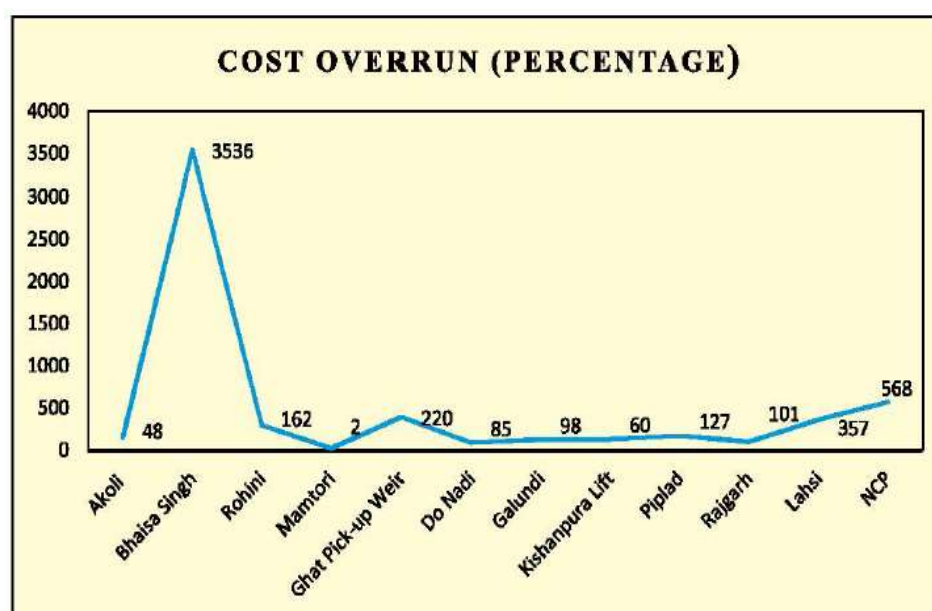
(₹ in crore)

Project	Original sanction	Revised sanction	Actual Expenditure	Cost increase (in percentage)	Status
NCP	467.53	3,124	2,969.74	568	Incomplete
Lhasi	44.73	204.23	215.38	357	Incomplete, even after excess expenditure
Piplad	33.64	91.21	76.49	127	Completed
Rajgarh	192.13	386.82	429.78	101	Incomplete, even after excess expenditure
Akoli	8.84	21.81	13.13	48	Completed
Bhaisa Singh	0.50	18.18	15.12	3,536	Incomplete, handed over to PHED
Do Nadi	4.91	9.09	9.10	85	Completed
Ghat Pick up Weir	3.10	15.03	9.91	220	Completed
Gulendi	13.46	30.21	26.62	98	Completed
Kishanpura	3.44	7.20	5.50	60	Completed
Mamtori	0.93	1.14	0.95	2	Completed
Rohini	2.43	9.53	6.36	162	Completed

* In cases where projects have been completed, percentage of cost increase has been calculated on the basis of actual expenditure. In other cases, where projects are in process, cost increase percentage has been calculated on the basis of revised sanction.

It is apparent from the table, that all the projects had significant cost overrun. The cost overrun of the projects is depicted in **Chart 3** below:

Chart 3: Cost Overrun percentage of selected projects



The cost overrun is indicative of planning deficiencies such as non-award of civil and mechanical works simultaneously, clearance of forest land, timely land acquisition etc. and absence of professional project management.

State Government accepted (March 2021) the facts in all projects except Rajgarh for which it was stated that the total expenditure was ₹ 393.52 crore up to January 2020. The total expenditure shown in the reply was not factual as in fact expenditure of ₹ 429.78 crore was incurred as per monthly accounts of the division.

3.4 Construction of unviable projects

(a) Akoli MIP

As per category of catchment area and run off, 27.583 Mcum, 0.591 Mcum and 9.401 Mcum water was to be received in the dam at 956 mm, 211 mm and 594 mm rainfall at Jalore during 2017, 2018 and 2019 respectively. However, water was received for full storage capacity (1.72 Mcum) for four months in the year 2017 and after that no water was received during the years 2018 and 2019. Non/short receipt of water in the newly constructed project despite good rainfall, reflects deficient pre- construction survey.

State Government replied that the rainfall received in catchment area was meagre during 2018 & 2019 and site selection is unquestionable as a flood lift of 1.6 meter in 2017 shows enormous inflow in dam. The Government's reply is not tenable as 594 mm rainfall was received during 2019 against 330.75 mm yearly rainfall estimated for achieving full storage capacity and still no water was received.

(b) Ghat Pick up Weir MIP

The project was constructed with an anticipation of receiving 64.577 Mcum water at 484.50 mm rainfall. However, no water was stored in 2014 to 2019 except a little water in 2016 despite rainfall of 353 mm to 734 mm⁵ during these years. Thus, proper catchment area was not envisaged in survey & investigation conducted prior to construction of the project.

State Government stated (September 2020) that due to less intensive and scattered rainfall in the catchment, runoff could not be generated. Reply is not tenable as in DPR the yield was evaluated as per annual rainfall of 484.50 mm whereas rainfall during the period 2014 to 2019 had ranged between 353 mm to 734 mm, which was sufficient to fill the pickup weir.

(c) Mamtori MIP

As per the quantum of rainfall received during 2013 to 2019, 0.11 Mcum to 2.85 Mcum water was to be received in the dam. However, no water was received in

⁵ 430.5 mm (2014), 513 mm (2015), 734.5 mm (2016), 391 mm (2017), 353.5 mm (2018) and 548 mm (2019).

these years. Non-receipt of water in the dam reflects that the hydrology of the dam was decided without proper survey & investigation.

State Government accepted the facts (March 2021).

3.5 Execution

Making water available for irrigation and drinking purposes to the intended beneficiaries is the central purpose of all the envisaged benefits under the projects. Hence, planning and distribution of water was to be effectively managed for the optimum and sustainable use.

Effective water management included creation of IP as envisaged, release of water as planned, provision of water for drinking purpose to intended beneficiaries and making water available round the year to facilitate changes in cropping pattern for the farmers.

3.5.1 Irrigation Potential achieved so far

The main deliverable of an irrigation project is the creation and utilisation of contemplated IP. Irrigation potential created is the total area which can be irrigated from a project on its full development and irrigation potential utilised is the actual irrigated area from a project during the period under consideration.

Targets were set in each project for creation of IP. Achievement of these targets was crucial for meeting the overall objectives of projects. The position of the targets fixed, I.P. created and utilized by the cultivators in respect of the selected projects is detailed as given in **Table 3.4**.

Table 3.4: IP targeted, created and utilization of Project

Name of Project (a)	IP target (ha) (b)	IP Creation (ha) (c)	Gap in IP creation (per cent) (d)	IP Utilized ⁶ (ha) (e)	Gap in IP utilized (ha) (f)	Percentage of IP utilized against created (g)
Narmada Canal Project	1.51 lakh	1.51 lakh	0	1.03 lakh	0.48 lakh	68.21
Lhasi	2,609	1,800	31	0	1,800	0
Piplad	3,549	3,549	0	81	3,468	2.28
Rajgarh	8,568	0	100	0	0	NA
Akoli	458	458	0	0	458	0
Bhaisa Singh	350	0	100	0	0	NA
Do Nadi	547.12	547.12	0	30.73	516.39	5.62
Ghat Pick up Weir (for flood irrigation)	0	0	NA	0	0	NA
Gulendi	2,535	2,535	0	239.25	2,295.75	9.44
Kishanpura Lift	1,455	1,455	0	776	679	53.33
Mamtori	64	0	100	0	0	NA
Rohini	365.94	365.94	0	0	365.94	0

Source: Information provided by the Water Resource Department

⁶ As per Revenue Department record.

It can be seen from the table above 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*.

The Project wise analysis of reasons and issues with IP creation and utilisation are as follows:

(i) Narmada Canal Project: In NCP, the area was to be considered as Cultivable Command Area (CCA)⁷ on completion of all civil⁸ and mechanical⁹ works relating to construction of canal, *diggies* and installation of micro-irrigation system.



Against the total IP of 1.51 lakh ha (*Kharif* 0.48 lakh ha + *Rabi* 1.03 lakh ha), 1.03 lakh ha of IP could be utilised for *Rabi* season, whereas water was not provided for *Kharif* season. Further, against total 2,231 *diggies*, only 2,032 *diggies* were electrified till September 2020. Thus, IP utilisation for *Rabi* of 1.03 lakh ha also could not be treated as fully utilized as claimed by the department because of non-electrification of 199 *diggies* till September 2020.

State Government stated (March 2021) that full IP created has been utilised in *Rabi* and *Kharif* seasons. It depends on rainfall condition of that year and irrigation intensity used by the cultivator in the *Rabi* season. Reply is not tenable as IP for *Rabi* 1.03 lakh ha could not be treated as fully utilized as envisaged in the project report because of non-electrification of *diggies*. Further, no document regarding utilization of IP in *Kharif* was made available to Audit.

(ii) Lhasi Project: Lhasi project was proposed to create IP of 2,609 ha by the year 2013-14. However, only 1,800 ha IP could be created as of February 2021 as canal network was not constructed. The main reason was non-allotment of canal work simultaneously with dam work and delay in land acquisition.

State Government accepted the facts (March 2021).

⁷ The area which can be irrigated from a scheme and is fit for cultivation.

⁸ Construction of *diggies*, pump room, sump well, boundary wall, etc.

⁹ Supplying, laying, jointing, testing and commissioning of pipeline and installation of mono block pumps.

(iii) Rajgarh project: As per DPR (2011), the project was to be completed in 2015. However, the project is yet to be completed. Rajgarh project could not achieve desired IP¹⁰ because the dam and canal network was not completed due to inordinate delay of four years in land acquisition. Land was finally acquired in 2015.

State Government stated (March 2021) that against total IP of 8,568 ha, IP created and utilised was 2,500 ha up to year 2019-20. However, the fact remains that project got delayed, envisaged IP of 8,568 ha could not be achieved till date. Further, no documents were made available to audit in support of irrigation of 2,500 ha.

(iv) Akoli Project: Akoli project could not utilise the created IP despite good rainfall. Non/short receipt of water in the project reflects that hydrology of dam was not accurate. No water was stored in the dam after completion of the project (September 2017).

(v) Do Nadi project: In Do Nadi project against the created IP of 547.12 ha, only 30.73 ha IP could be utilised due to poor maintenance of distributaries system.

State Government stated (March 2021) that during the period 2015-16 to 2019-20 irrigated area ranged between 235 ha and 379 ha whereas as per revenue department data it was only 30.73 ha. The department did not make available any document/data in support of the claimed irrigated area to Audit.

(vi) Ghat Pick UP Weir: Ghat Pick UP Weir was constructed (2007) to utilise the water of Ruparail River, with the objective of flood irrigation during rainy season for *Kharif* crops and recharging of surrounding wells. However, water was not received since 2014 except a little water in 2016 due to inappropriate catchment area. Hence, the achievement was nil.

(vii) Gulendi Project: Gulendi was to utilise 2,535 ha of created irrigation potential. However, only 239.25 ha i.e. 9.44 per cent could be achieved due to non equitable water supply for irrigation.

State Government stated (March 2021) that Revenue Department was not keeping correct and complete records of revenue Girdawari and IP target was fully achieved. Reply was not tenable as only 239.25 ha was irrigated in *Rabi* season as per Revenue record and WRD could not provide any document substantiating achievement of full IP target.

(viii) Rohini dam: The Rohini dam was constructed (2013) as reserve dam for Sei Pick Up Weir project. The Sei Pick Up Weir project was constructed in the year 1960. The water of the Rohini dam was proposed to be released in the upstream of Sei Pick Up Weir. In the meanwhile, the canal system of Sei Pick Up Weir got damaged due to ageing and poor maintenance. The age gap between both projects was not considered in planning. Consequently,

¹⁰ Planned IP was 8,568 Ha.

276.41 ha command area of the project could not be benefitted and project proved to be unfruitful.

State Government stated (March 2021) that water stored is utilized through Seepick up weir and its canal system since 2013 and now Rohini Dam has been handed over to Panchayati Raj Department (2019). The reply is not tenable as according to Revenue Department no irrigation activity was executed. It was also observed by audit during joint inspection with the departmental representatives (December 2019) that no irrigation activities were carried from the dam. Blockages/silting/vegetation in the canal and leakage in the dam were also found as shown below:



Leakages in the Rohini dam

(ix) **Piplad Project:** Piplad project was proposed to create 3,549 ha IP by the year 2011-12 and was to take about four years (2014-15) for full development. Against targeted IP of 3,549 ha, 1,445 ha (40.71 per cent) IP was created in the year 2014-15 and remaining 2104 ha in the year 2018-19. As per information provided by Revenue Department, IP utilised was only 81 ha during 2014-15 to 2018-19 (2.28 per cent of target IP). WRD had not maintained the IP utilisation records.

State Government stated (March 2021) that WRD was not responsible for Revenue Department data. The reply was not tenable as department did not provide any data/document regarding IP utilised.

(x) In **Kishanpura** project, out of the 1,455 ha of IP created, the IP utilized was only 776 ha (53.33 per cent) as no water was released in Kharif season.

State Government accepted (March 2021) the facts.

(xi) **Mamtori project:** Mamtori project could not achieve any target due to non-construction of outlets and canal work in complete length. Further, no water was stored in the dam after its completion due to defective hydrology.

State Government accepted (March 2021) the facts.

3.5.2 Water allocation and release

As per the DPRs of the projects, water requirement in Kharif and/or Rabi season could be made easily available from their respective project and accordingly, the irrigation was expected throughout the year in the projects. However, following deficiencies were noticed.

3.5.2.1 Non maintenance of Water Release Data

The data of water release is a crucial parameter to assess the impact of the project and successful delivery of its outcomes. However, this information could not be made available to audit even for the Major irrigation project- NCP. According to DPR of NCP, water available for irrigation was estimated as 573.26 Mcum for total CCA of 2.46 lakh *ha*. Department has not provided information of year wise water release including available groundwater in the command area to audit. In the absence of this data, the availability of water to intended beneficiaries as well as compliance with the release orders could not be assessed.

State Government stated (March 2021) that data of annual water released in command area and ground water were available as per project report. Reply was not tenable as in the absence of actual data, the availability of water to the intended beneficiaries as well as compliance with the release orders could not be assessed in audit.

3.5.2.2 Deficient Release of water

In five projects water released for irrigation was far less than what was envisaged and reserved. The major reasons for this were non construction of canal system and non-maintenance of canals and dam.

Table 3.5: Status of Water Release

Project	Water release envisaged/ stored	Status of water release
Lhasi	Irrigation: 10.353 Mcum Drinking Water: 7.3 Mcum Thermal Power plant: 8.5 Mcum	No water was released for irrigation till March 2020. During 2016-20, 1.18 to 1.42 Mcum per annum was utilised for drinking water and 4.17 to 6.45 Mcum per annum was utilised for Chhabra Thermal Power Plant during 2018-20. State Government accepted the facts (March 2021).
Rajgarh	Irrigation 43.43 Mcum	Only 22.60 Mcum water was stored during the year 2019-20. However, no water was released for irrigation. State Government stated (March 2021) that the stored water was utilized in IP creation of 2500 <i>ha</i> and supply of drinking water to PHED. Reply was not tenable as the canal work was not completed

Project	Water release envisaged/ stored	Status of water release
		and no documents were made available to Audit in support of irrigation of 2500 <i>ha</i> .
Akoli	Irrigation 1.72 Mcum	No water was released in 2017. No water was stored since completion of the project (September 2017), though sufficient rain-fall was recorded in catchment and run-off.
Rohini	Irrigation 1.93 Mcum	No water was released for irrigation. This fact was verified during the joint physical verification.
Mamtori	Irrigation 0.472 Mcum	No water was released or stored due to non-construction of outlets and canal system in complete length. State Government accepted the fact (March 2021)

3.5.2.3 Excess release of water

(i) In Piplad, 14.79 Mcum and 5 Mcum water was reserved for irrigation and drinking purpose respectively. As per DPR, to irrigate the created IP of 1,445 *ha*, 6.02 Mcum water was sufficient whereas 8.23 and 14.69 Mcum water was released during 2015-16 and 2016-17. Thus, 2.21 and 8.67 Mcum excess water was released.

State Government stated (March 2021) that water was released as per cultivators' demand. The reply is not tenable as the water was to be released as per IP created rather than as per cultivators' demands. Further, no document was furnished along with the reply substantiating that the water was released on the basis of demand received from cultivators.

(ii) Similarly, in Gulendi MIP, out of total IP 2,535 *ha*, cultivators sown only an average area of 239.25 *ha* during 2015 to 2019. Crop-wise water requirement for area of 239.25 *ha* was assessed as 0.850 Mcum but actual annual average water released during this period was 8.028 Mcum. Thus, on an average excess water of 7.178 Mcum was released during these years. Due to releasing excess water than required, the possibility of increase in water logging and salinity cannot be ruled out.

State Government stated (March 2021) that the water was being provided in total command area of 1,950 *ha*. The reply is not acceptable as only 239.25 *ha* area was sown according to revenue records and WRD had neither maintained nor provided any records of irrigated area on its own.

3.5.2.4 Unauthorised lifting of water

Compulsory pressure irrigation i.e use of sprinkler and drip was adopted in the entire command area of NCP so as to reduce seepage of irrigation water to groundwater and to control the rise of ground water table. It was observed in joint physical inspection that the Main Canal, its distributaries and minors/sub-minors suffered from the problem of water theft by nearby cultivators who lifted water by using motor pumps and pipes, conveying water to that part of their land holding which was not covered under *diggy* system. Due to these activities

waterlogging and salinity increased in some villages (e.g. Chimadi, Agaawa, Bhaleti, Padaradi, Manki, Surawas, Arniyali of command area and adjoining villages). State Government accepted (March 2021) the facts.



Unauthorised water lifting in NCP as water was taken directly from canals

3.5.3 Provision of 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**.

Table 3.6: Irrigation Projects and number of villages/ towns to be benefitted

S. No.	Name of Project	No. of villages/town to be benefitted from the scheme	No. of villages/ town actually benefitted from the scheme
1	Narmada Canal Project	874 villages and three towns of Jalore District; 667 villages of Barmer district.	446 villages of Jalore District
2	Lhasi Medium Irrigation Project	21 villages and two towns of Baran District.	Two towns of Baran District
3	Piplad Medium Irrigation Project	16 villages/towns of Jhalawar district.	Water provided to all villages/ towns
4	Rajgarh Medium Irrigation Project	54 villages and 15 other habitations of Pachpahar tehsil and 157 villages of Jhalarapatan tehsil and Jhalarapatan town.	54 villages and 15 other habitations of Pachpahar Tehsil
5	Bhaisa Singh Minor Irrigation Project	In 2016 dam was handed over to PHED for providing drinking water to Abu Road Town.	Supply of drinking water has not been started till March, 2020

S. No.	Name of Project	No. of villages/town to be benefitted from the scheme	No. of villages/town actually benefitted from the scheme
6	Do Nadi Minor Irrigation Project	Project feed the Som Kagder dam for providing drinking water to Rishabdev town and enroute villages.	Water provided to all villages/ towns
7	Gulendi Minor Irrigation Project	77 villages and Aklera town	Water provided to all villages/ towns

During scrutiny, following were noticed:

(i) In Lhasi, water supply scheme for two towns of Baran district had been completed (August 2016) in Ist Phase with delay of 24 months and in IInd Phase, planning for supply of water to the village area was in process.

State Government stated (March 2021) that action was to be taken by the PHED.

(ii) In Piplad, work of water supply scheme for projected area was delayed by 20 months. State Government accepted (March 2021) the facts and stated that it was due to delay in site selection of filter plant.

(iii) In Rajgarh, water supply scheme has been completed with delay of seven months. Information regarding drinking water for Jhalarapatan tehsil and town was not provided to audit. State Government stated (March 2021) that action was to be taken by PHED.

(iv) In Do Nadi, dam work was completed in August 2007, however, PHED started supply of drinking water in June 2017 with delay of more than ten years.

State Government accepted the facts (March 2021).

3.6 Non-realization of Share cost, compensation and undue payment of price variation

Audit test checked the status of payment of share cost by other departments, details of compensation for not maintaining the pro-rata progress of work and payment of price variation to the contractor.

Deficiencies noticed in respect of above issues are commented below:

3.6.1 Short/non realization of share cost

(i) In Lhasi, the BCR of the project was evaluated as 1.52:1 by considering the cost to be shared by the Rajasthan Vidyut Utpadan Nigam Limited (RVUNL) and PHED as ₹ 68.75 crore and ₹ 59.12 crore respectively. However, while sanctioning the Administrative Estimate, the share cost to be borne by RVUNL and PHED was revised to ₹ 59.40 crore and ₹ 51.09 crore. Accordingly, RVUNL had deposited the share cost amount. However, PHED did not deposit the share cost as of date and as per the view of Finance

Department, it is not necessary to sanction the share cost now as the dam work had been completed. Due to share cost not being deposited by PHED, the capital cost becomes higher to this extent and BCR comes to only 1.06:1.

State Government stated (March 2021) that share cost of RVUNL and PHED was ₹ 68.75 crore and ₹ 59.12 crore respectively and demand for difference amount is being made continuously. Reply is not tenable as after representation of RVUNL, department had recalculated the share cost amount as ₹ 59.40 crore (RVUNL) and ₹ 51.09 crore (PHED) which was deposited by RVUNL.

(ii) Other projects

The project reports of selected seven projects envisaged share of cost, as given in the table below, to be payable by PHED for utilization of water for drinking.

Scrutiny of the records revealed that the envisaged share of cost was not paid by the PHED in four projects as given in **Table 3.7**.

Table 3.7: Share of cost

(₹ in crore)				
S. No	Name od Project	Share to be paid by PHED	Share paid by PHED	Balance
1	Narmada Canal Project	296.71	216.33	80.38
2	Piplad Irrigation Project	22.80	17.49	5.31
3	Bhaisa Singh MIP	15.11	-	15.11
4	Gulendi MIP	7.24	3.89	3.35

State Government stated (March 2021) that the recovery was in process.

3.6.2 Non recovery/levy of compensation

According to clause 2 and 3 (c) of the contract, the contractor was liable to pay compensation for not maintaining the *pro-rata* progress of the work and extra cost incurred on balance work executed by another contractor at the risk and cost of the original contractor.

Scrutiny of records of selected divisions of NCP, Lhasi, Piplad, Ghat Pick up Weir, Kishanpura Lift, Bhaisa Singh, Gulendi and Do Nadi projects revealed that in 10 cases, contractors neither maintained pro-rata progress nor taken responsibility for extra cost. The divisions failed to recover the compensation amount of ₹ 2.42 crore as detailed in **Appendix-III**.

State Government stated (March 2021) that in seven cases efforts are being made for recovery. However, in remaining three cases, State Government has recovered less amount as final adjustment from the contractor than was liable to be recovered, in contravention of Clause 2 and 3 (c) of the contract.

3.6.3 Undue benefit to contractor

The work for construction of main dam of Rajgarh Project was awarded to the contractor on turnkey basis for ₹ 87.04 crore with stipulated dates of commencement and completion as 7 July 2013 and 6 January 2016 respectively.

Clause 18 of General conditions of contract stipulates that price variation clause shall be applicable in case of lump sum contracts estimated to exceed ₹ 100 crore with stipulated completion period exceeding 18 months. Further, Clause 21.1 of special conditions of the contract stipulates that the contractor shall, on the written order of the owner, suspend the progress of the works or any part thereof for such time and in such manner as the owner may consider necessary, and shall properly protect and secure the works so far as is necessary in the opinion of the owner during such suspension. The extra cost, including that occasioned by the subsequent resumption of work, incurred by the contractor in giving effect to the owner's instructions shall be borne and paid by the owner.

Scrutiny of records revealed that the contractor executed the work for ₹ 1.69 crore up to October 2013 and thereafter left the work whereas it was stipulated in the contract that contractor shall pay special attention as regards achieving mile stones on schedule. The contractor resumed the work in September 2014 without any condition and the work was still in progress as on March 2020.

Deputy Secretary, WRD ordered (May 2018) that payment should be made as per clause 21.1 of special conditions of the contract. However, the Divisional Officer made payment of ₹ 2.77 crore (May 2018) to the contractor on the basis of price variation clause despite the fact that price variation was not payable.

State Government stated (March 2021) that the contractor in line with clause 21.1 has informed (October 2013) the department about hindrances caused by the displaced persons of the project and department advised (January 2014) the contractor to suspend the work to safeguard the men and machineries at site till the matter is resolved. Payment in terms of price variation was found to be the most rational and reasonable method of working out extra cost due to the contractor because of suspension of work for reasons not attributable to contractor. Meanwhile, the honorable High Court also directed status *quo* (December 2013) to be maintained. The stay was vacated in May 2016.

The reply is not acceptable as at various times¹¹, department itself communicated to the firm that department has given the advice but it had never directed firm to stop the work. Being an "EPC single responsibility contract" firm was responsible for sorting out the hindrance. As 60 *per cent* of the area was Government land and hindrance free, department wanted work to be continued. The matter before High Court was only for a specific area (cultivators' land). Hence the extra payment made under clause 21.1 was irregular.

3.7 Summary of findings

Audit observed that deliverables of irrigation projects were not planned, executed and managed in accordance with the intended objectives. The achievement of intended outcomes was marred by several issues. Audit found deficiencies in preparation of DPR and survey work which shows that the initial planning was not proper. There were cases of delay in acquisition of land and

¹¹ July 2014, August 2014 and September 2014.

forest clearance, time and cost overrun of projects, construction of unviable projects, non-maintenance of data/records and undue benefit to contractors. All these had cascading effect on timely execution of the projects. Four projects could not create any IP. Three projects could not utilise any IP created while the utilisation of IP created ranged between 2.28 to 68.21 *per cent* in other projects.

3.8 Recommendations

- *Department may develop detailed guidelines for planning, execution and monitoring of medium and minor irrigation projects. Intended outcomes and responsibility to achieve those should be clearly assigned at the planning stage.*
- *Department should ensure maintenance of water release data, monitoring of excess release of water and establishment of adequate control mechanism to counter water theft.*