

**Part One**  
**Achievement of Objectives**



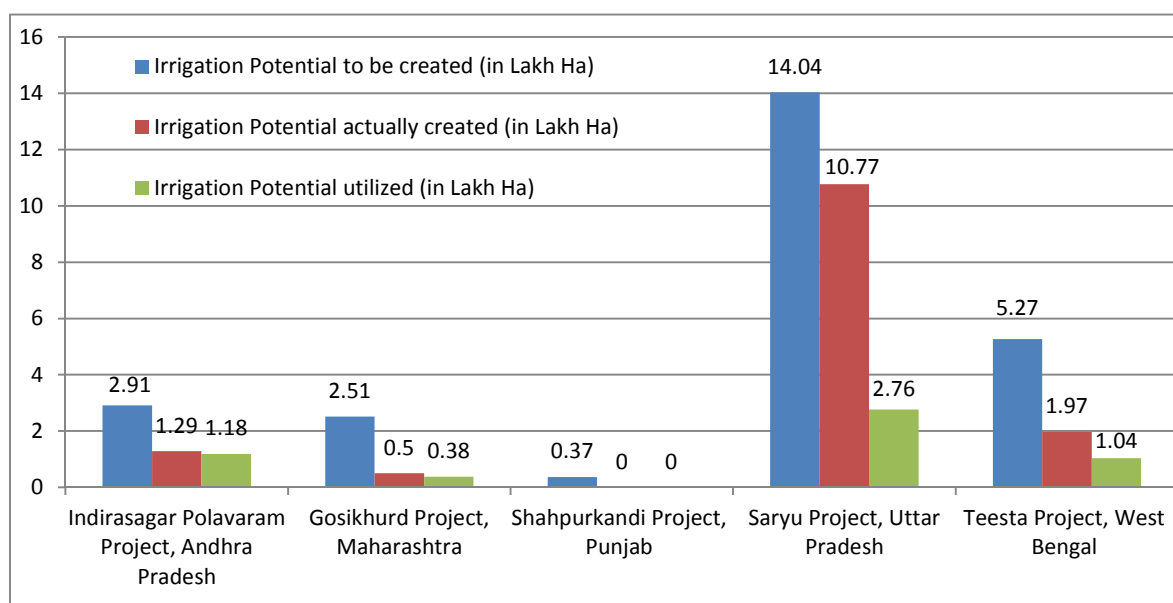
## Achievement of Objectives

### 1.1 Creation and Utilisation of Irrigation Potential

<b>Target of creation of Irrigation Potential from 16 National Projects</b>	<b>35.58 lakh Ha</b>
<b>Target of creation of Irrigation Potential from five National Projects under implementation</b>	<b>25.10 lakh Ha</b>
<b>Total Irrigation Potential created from the five National Projects</b>	<b>14.53 lakh Ha</b>
<b>Total Irrigation Potential utilised from the five National Projects</b>	<b>5.36 lakh Ha</b>

As of March 2017, only five out of 16 National projects with estimated Irrigation Potential (IP) of 25.10 lakh Ha were under implementation. The remaining 11 projects with estimated IP of 10.48 lakh Ha are yet to start. In the five projects under implementation, while 14.53 lakh Ha IP has been created, a mere 5.36 lakh Ha (37 per cent) IP is being utilised. The position of creation and utilization of Irrigation Potential in five running projects is indicated in Chart 1 below:

**Chart 1: Status of Irrigation Potential for five projects (envisaged, created, utilised)**



Thus, the Saryu Project alone accounts for 74 *per cent* of the total irrigation potential actually created and it is negligible in the remaining four projects under implementation. Further, no project except the Indira Sagar Polavaram project in Andhra Pradesh has been able to utilise more than 20 *per cent* of the envisaged IP. The utilisation of created potential was low due to gaps in structures and connectivity of the projects and absence of *pari passu* implementation of Command Area Development work for creation of final distributaries to ensure supply of water in the fields.

The position of 11 projects which are at different stages of approval is given in Table 3 below:

**Table 3: Details of 11 projects at different stages of approval (March 2017)**

Sl. No.	Name of project	Concerned States (River)	Irrigation Potential (lakh Ha)	Estimated Cost of the Project (₹ in crore)	Current status of the Project
1.	Lakhwar Project	Uttarakhand, Himachal Pradesh (Yamuna)	0.34	3,966.51	Investment Clearance granted in February 2016. CA is yet to be released as inter-State agreement is not finalized
2.	Ken-Betwa Project	Madhya Pradesh, Uttar Pradesh (Ken Betwa, Yamuna)	6.35	18,057.08	Investment clearance granted in June 2017 subject to forest clearance.
3.	Renuka Dam Project	Himachal Pradesh (Giri & Yamuna)	-	4,596.76	Investment Clearance is yet to be granted due to pending Forest Clearance.
4.	Kulsi dam Project	Assam (Kulsi)	0.21	1,139.27	The DPR of the project is under appraisal in CWC since June 2014.
5.	Noa Dihing Project	Arunachal Pradesh (Noa-Dihing)	0.04	1,086.06	The DPR of the project is under appraisal in CWC since October 2014.
6.	Bursar HE Project	Jammu & Kashmir (Chenab & Indus)	1.74	16,839.90	The DPR of the project is under appraisal in CWC since January 2017.
7.	Kishau Project	Uttarakhand (Tons & Yamuna)	0.97	7,193.24	The DPR of the project is under appraisal in CWC since October 2010 as Kishau Corporation Ltd has

Sl. No.	Name of project	Concerned States (River)	Irrigation Potential (lakh Ha)	Estimated Cost of the Project (₹ in crore)	Current status of the Project
					not responded to CWC queries raised during 2010-11.
8.	Ujh Project	Jammu & Kashmir (Ujh & Ravi)	0.32	3,630.73	The DPR was initially sent to CWC in 2013 however due to deficiencies noticed, it was sent back to State. Modified DPR is still awaited from the State Government.
9.	Gyspa HE Project	Himachal Pradesh (Bhaga , Chenab)	0.50	NA	DPR is under preparation by State Government
10.	Upper Siang Project	Arunachal Pradesh (Siang)	-	NA	DPR is under preparation by State Government.
11.	2nd Ravi Project	Punjab (Ravi Beas Link)	-	NA	Project is in pre-feasibility stage

As can be seen from above, though investment clearance has been granted in two projects (Lakhwar and Ken Betwa), the funding for the projects has yet to be approved due to lack of an agreement between concerned States defining benefit sharing and financial burden. In one project (Renuka), the Detailed Project Report (DPR) has been finalised but investment clearance is pending due to lack of forest clearance. In three projects (Kulsi, Noa Dihing and Bursar), DPR is under scrutiny with CWC for up to three years as on March 2017. Remaining five projects (Kishau, Ujh, Gyspa, Upper Siang and 2<sup>nd</sup> Ravi) are pending with States for submission to CWC. Thus, all 11 projects with irrigation potential of 10.47 lakh Ha are yet to commence.

## 1.2 Realisation of benefits of Power, Drinking Water and Reservoir

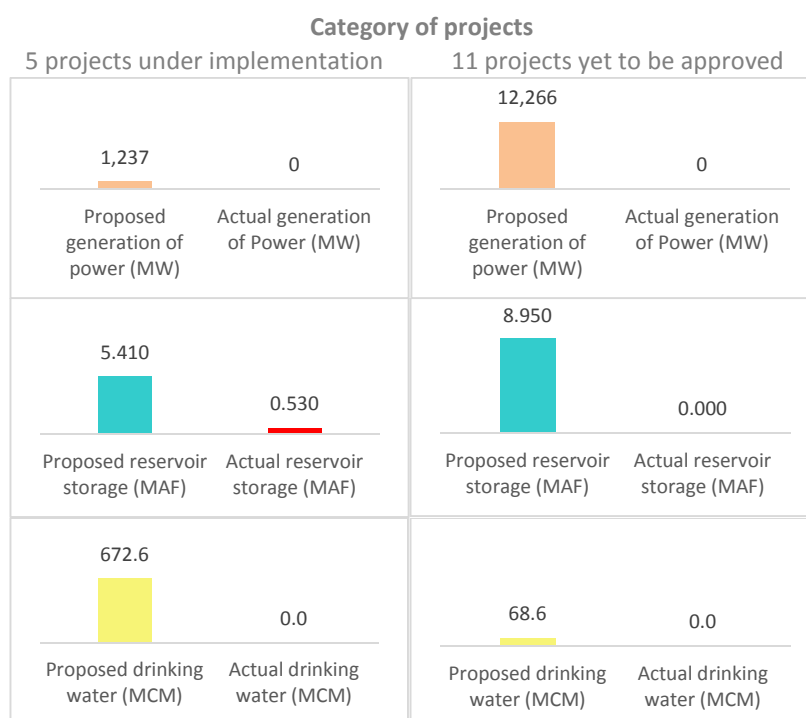
In addition to creation of IP, it was envisaged that the National Projects would also result in addition of reservoir capacity of 14.363 MAF<sup>6</sup> and augmentation of drinking water by 741.23 MCM<sup>7</sup> and power generation by 13,503 MW<sup>8</sup>. Chart 2 indicates the details of targets and achievements in respect of all the 16 projects.

<sup>6</sup> Million Acre Feet

<sup>7</sup> Million Cubic Metre

<sup>8</sup> Mega Watt

**Chart 2: Details of targets and achievements in 16 projects**



As may be seen, none of these envisaged benefits are being delivered by these 16 projects as of March 2017 except creation of 0.53 MAF reservoir capacity in Gosikhurd project.

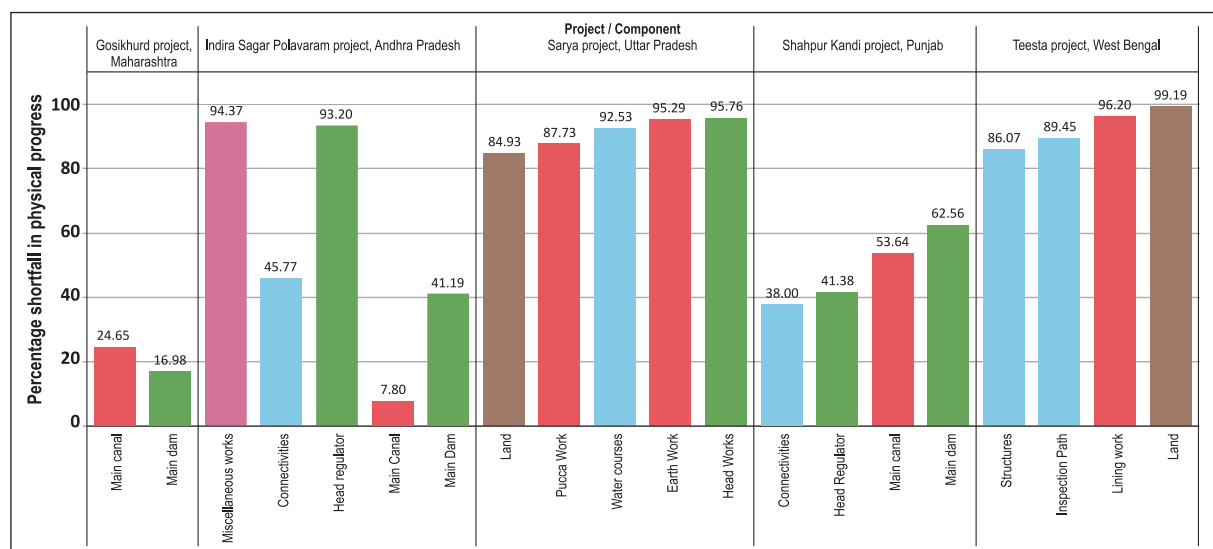
### 1.3 Physical Progress of five projects under implementation

<b><u>Project</u></b>	<b><u>Timeline for completion</u></b>
<b>Shahpur Kandi project (Punjab)</b>	<b>March 2015 (Delayed)</b>
<b>Teesta project (West Bengal)</b>	<b>March 2015 (Delayed)</b>
<b>Indira Sagar Polavaram project (Andhra Pradesh)</b>	<b>June 2019</b>
<b>Gosikhurd project (Maharashtra)</b>	<b>December 2019</b>
<b>Saryu project (Uttar Pradesh)</b>	<b>March 2016 (Delayed)</b>

The overall position of the status of the five projects under implementation are as below:

Chart 3 below indicates percentage shortfall in physical progress of different project components of these five projects such as dam, head regulators, canals, connectivity and structures.

**Chart 3: Details of shortfall in physical progress in different project components**



The shortfall in physical progress in different components of the five projects under implementation ranged from eight to 99 *per cent*. On comparing the physical progress of components with the timelines for completion of these projects, we noticed the following:

- In Gosikhurd project (Maharashtra), there was shortfall ranging between 17 *per cent* in main dam and 25 *per cent* in main canal.
- In Indira Sagar Polavaram project (Andhra Pradesh), shortfall on five components included shortfall of 93 *per cent* in head regulator, 46 *per cent* in connectivity, 41 *per cent* in main dam, 94 *per cent* in miscellaneous works and eight *per cent* in main canal. With 41.19 *per cent* shortfall in main dam and 93.20 *per cent* shortfall in head regulators, it appears that target completion date of June 2019 may be difficult to achieve. Only 7.3 *per cent* viz. ₹ 4,008 crore, of total project cost of ₹ 55,133 crore had been incurred so far.
- In Saryu project (Uttar Pradesh), the shortfall in land, pucca works, water courses, earth work and head work ranged between 85 to 96 *per cent*. With original target of completion by March 2016 already having passed, there was risk of further delay and cost overruns as 43 *per cent* of its cost had been incurred though 85-96 *per cent* of five component works are yet to be completed.

- d) In Shahpur Kandi project (Punjab), the shortfall ranged between 38 to 63 *per cent* in four components of main dam (62.56 *per cent*), main canal (53.64 *per cent*), head regulator of 41.38 *per cent* and connectivity of 38 *per cent*. With original target of completion by March 2015 having passed, 63 *per cent* shortfall on main dam and 54 *per cent* shortfall on main canal not only indicates poor implementation but has the risk of further delay and cost overruns. It is noted that only ₹ 26.04 crore had been spent against total project cost of ₹ 2,285.81 crore as of March 2017.
- e) In Teesta project (West Bengal), the shortfall was 86 to 99 *per cent* in four components of land, lining work, inspection paths and structures. Against project cost of ₹ 2,988.61 crore, expenditure is only ₹ 285.72 crore viz. 9.56 *per cent*.

We also noticed gap between completion of dam work and canal work in case of Gosikhurd project (Maharashtra), Indira Sagar Polavaram project (Andhra Pradesh) and Shahpur Kandi project (Punjab) reflecting lack of synchronization of different project components. The shortfalls in connectivity were mainly attributable to inadequate land acquisition, inefficient Rehabilitation and Resettlement (R&R) measures and lack of monitoring as discussed in detail in part two of the report.

Completion of Command Area Development (CAD) work for last mile of distributaries and connectivity is essential to utilize the irrigation potential created by the project. As per National Project Guidelines (2008), CAD programme need to be implemented *pari passu* with project implementation. Project authorities responsible for CAD works have to submit separate proposal for funding of CAD works under a different scheme of MoWR, RD&GR. We observed that no proposal for CAD works has been sent to CWC in any of the five projects under implementation except Gosikhurd as of March 2017. In absence of *pari passu* implementation of CAD works, IP would not be utilized even if projects are completed and create desired IP.

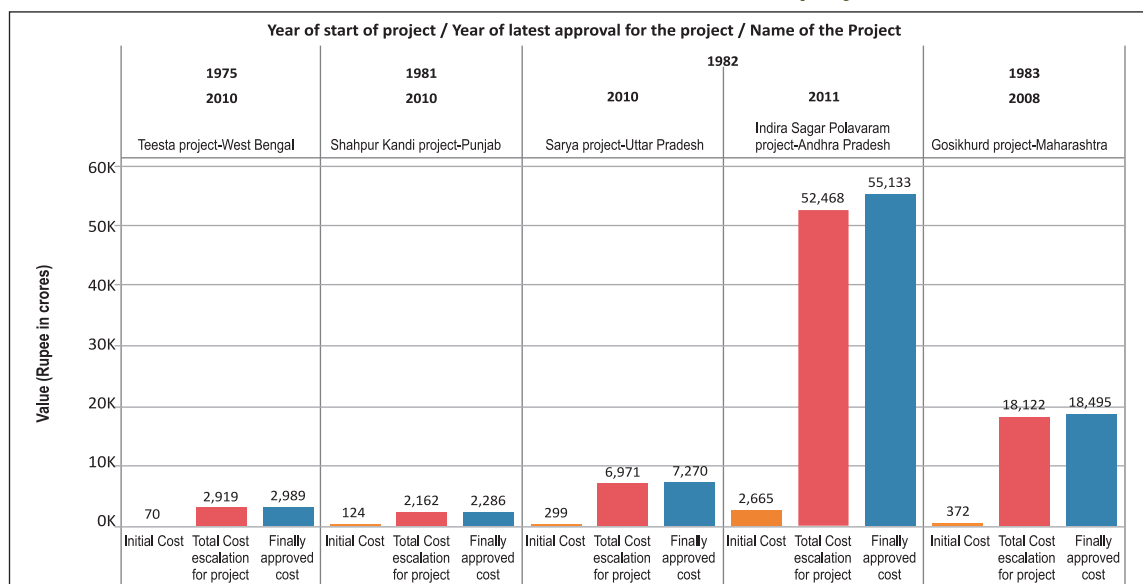
#### 1.4 Timelines and cost escalation

<b>Initial cost of five projects</b>	<b>₹ 3,530 crore</b>
<b>Current Cost of five projects</b>	<b>₹ 86,172.23 crore</b>
<b>Cost escalation</b>	<b>2,341 <i>per cent</i></b>



Chart 4 below indicates year of commencement, current revision of the five projects, corresponding cost estimates and resultant cost escalation.

**Chart 4: Details of cost escalation in five projects**



Final cost of Indira Sagar Polavaram project and Gosikhurd project is yet to be accepted by CWC. Figures are rounded off so may not total.

All the five projects had suffered cost escalations ranging ₹ 2,162 crore to ₹ 52,468 crore indicating an overall cost escalation of 2,341 per cent. The cost has increased over the years while the intended benefits have remained the same.

Increase in the cost without proportionate increase in the benefits adversely affects the economic viability of these projects measured by Benefit Cost Ratio (BCR). The BCR is defined as the ratio of annual additional benefit on account of irrigation to the annual cost<sup>9</sup> of providing those benefits. The BCR is essential to determine the economic viability of the project and is generally incorporated in the DPRs. As per extant guidelines, projects having minimum BCR of 1 for drought prone area and 1.5 for other area are considered economically viable.

We analyzed changes in BCR of three projects with respect to increase in cost and the same in respect of three projects as indicated in Table 4 below.

<sup>9</sup> Annual cost includes fixed costs such as depreciation of the project and interest on capital along with running costs such as operations, maintenance and power. Format for calculation of BCR is prescribed by Guidelines for preparation of DPR for irrigation projects (2010).

**Table 4: Details of BCR of three projects along with cost revision**

Project	Year of sanction	Cost (₹ in crore)	Sanctioned BCR
Indira Sagar Polavaram project	2009	10,151.04	1.73
	2011	16,010.45	1.70
	2017	55,132.92	Yet to be calculated but given increase in cost, BCR would reduce further.
Teesta project	1975	69.72	2.53
	2010	2,988.61	1.52
Gosikhurd project	1983	372.22	1.58
	1999	2,091.13	1.53
	2016	18,494.57	Yet to be calculated but given increase in cost, BCR would reduce further.

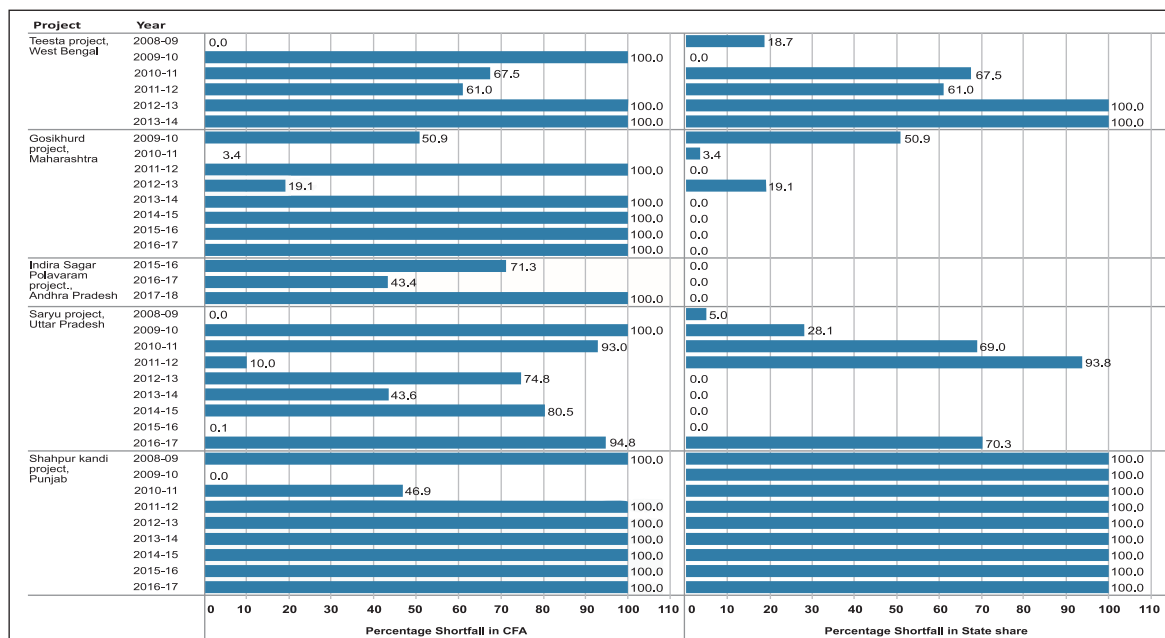
As can be seen from above, the BCR in respect of three projects has reduced over a period of time with revision in cost. In case of Gosikhurd project and Indira Sagar Polavaram project, the current BCR is yet to be calculated by CWC but has the evident risk of further reduction.

An analysis of the cost revisions of the two projects where execution of works were underway viz. the Indira Sagar Polavaram project and Gosikhurd project revealed that the cost escalations were mainly attributable to increases in changes in scope of work as well as cost of land acquisition and R&R particularly after the introduction of the Land Acquisition Act, 2013. The Indira Sagar Polavaram project, Andhra Pradesh, was included in the scheme with a cost of ₹ 16,010 crore (2010-11 Price Level) in 2014. Now a revised estimate of ₹ 55,133 crore (2013-14 Price Level) has been approved by the State Government and is pending approval by CWC. This cost escalation of 244 *per cent* is primarily due to increase in R&R cost, land acquisition and increase in scope of work. Similarly, Gosikhurd project in Maharashtra was included in the scheme of National Projects in 2008 at a cost of ₹ 7,778 crore (2005-06 Price Level). Now a revised estimate for ₹ 18,495 crore (2012-13 Price Level) has been approved by State Government and is pending approval by CWC. This cost escalation of 138 *per cent* is also primarily due to increase in cost of work and change in scope of the project.

Thus, cost escalation in five projects up to inclusion in scheme of National Projects was ₹ 32,802 crore. However after inclusion, two projects itself have registered a cost escalation of ₹ 49,840 crore. Remaining three projects have already overshoot their approved completion time and none of them is yet complete and there is a risk that they may also undergo cost escalation in future.

Chart 5 indicates shortfall in release of funds for five projects from centre (Central Assistance) as well as States (Committed Liabilities). Shortfall has been indicated against the proposed release of fund in a year. Only those years are indicated wherein a shortfall was noticed.

**Chart 5: Percentage shortfall in release of CFA and State Share**



Shortfall in Central Assistance ranging up to 100 per cent was found in 32 instances across all five projects during the period 2008-17. Similarly, shortfall in release of State’s share up to 100 per cent was noticed in 22 cases across four projects during 2008-17. Delay in release of Central Assistance and State’s share affects physical progress of work, acquisition of land and implementation of R&R measures.

Ministry stated (January 2018) that the escalation in cost depends upon a variety of factors including inter-State issues, land acquisition and R&R issues which may not be under control of the implementing authorities. Audit observed that while there may be factors that were beyond the control of the implementing authorities, a significant portion of the delays were attributable to identification of land, delays in progressing land acquisition by the revenue authorities and in finalizing R&R measures that could have been mitigated by better and effective coordination between the different authorities and agencies involved.

## **Audit Summation**

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Thus, the benefits envisaged from the implementation of the National Projects had yet to accrue. While 11 of the projects had not even commenced, the five projects under implementation suffered from both cost and time overruns. There was addition of only 14.53 lakh Ha of Irrigation Potential constituting 41 *per cent* of envisaged IP of 16 projects as on March 2017. Further, the utilised IP of 5.36 lakh Ha constituted only about 37 *per cent* of IP created and just 15 *per cent* of total IP envisaged for 16 projects. Most of the irrigation potential created and utilised was accounted for by only the Saryu Project with negligible achievement by the other four projects under implementation. Further, there was also mismatch between creation of dam and canal infrastructure, gaps in connectivity and structures and lack of *pari passu* implementation of CAD works that would subsequently impact utilization of created IP due to absence of distributaries.

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