

CHAPTER III

COMPLIANCE AUDIT

Important audit findings that emerged from the test check of transactions of the Departments of the Government of Gujarat in the Economic Sector are included in this Chapter.

FORESTS AND ENVIRONMENT DEPARTMENT

3.1 Regulation of activities in the Protected Areas of Gujarat

3.1.1 Introduction

Wildlife refers to living organisms in their natural habitats. Protected Areas (PAs) are natural habitat of wildlife which is a national resource that helps in maintaining the ecological balance. Over the years many species of flora and fauna have been pronounced extinct and several others are at the verge of extinction. Deforestation, illegal hunting, habitat reduction and its degradation, *etc.*, are a threat to the PAs; therefore, their regulation is a necessity for conservation and protection of wildlife.

Protected Areas are constituted and governed under the provisions of Wildlife (Protection) Act, 1972 (WPA). The WPA empowers the State Governments to declare any area of adequate ecological, faunal and floral, geomorphological, natural or zoological significance as a Wildlife Sanctuary (WLS) and National Park (NP) for the purpose of protecting, propagating or developing wildlife or its environment. Section 36(A) of the WPA empowers the State Government to declare any area, particularly the areas adjacent to NP and WLS and those which link one protected area with another, as Conservation Reserves (CR) for protecting landscape, seascapes, flora and fauna and their habitats.

The WLS, NP and CR are called Protected Areas (PA).

3.1.2 Protected Areas in Gujarat

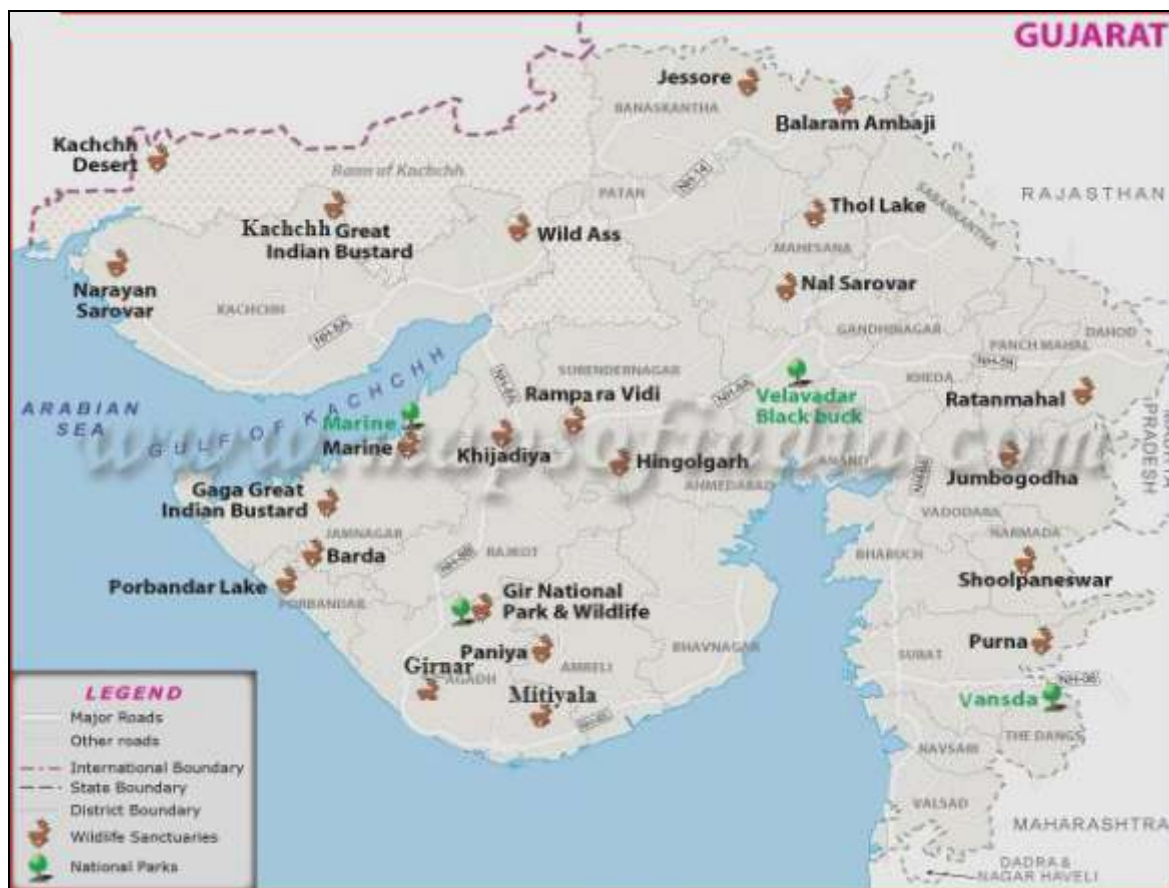
In Gujarat, there are 28 PAs¹ (**Appendix V**). Total area of PAs in Gujarat is 17,099.93 square kilometres (sq km) but only 4,640.58 sq km (27.14 *per cent*) is forest land and remaining is non-forest ecosystems. Further, the geographical area of Gujarat is only 5.90 *per cent* of the total area of India but 11.37 *per cent* of total PA of the country is located in Gujarat.

Gujarat has diverse geo-physical and eco-climatic features, with the longest coastline. Due to the diverse eco-systems, Gujarat has rich biological diversity consisting of 14 *per cent* of marine, 18 *per cent* of reptiles, 37 *per cent* of avifauna and 25 *per cent* of the mammal species of India. Further, Gujarat falls *en route* the trans-continental annual migration of avian species and is also the only habitat of the Asiatic Lion and Indian Wild Ass.

¹ 23 WLS, four NPs and one CR.

The map showing indicative locations of the Wildlife Sanctuaries and National Parks in Gujarat is given below:

Map showing indicative locations of Wildlife Sanctuaries and National Parks in Gujarat



(Source: from mapsofindia.com)

3.1.3 Authorities for the regulation of activities in PAs

Regulation of the activities in the PAs is governed by the WPA, which is further complemented by Forest Conservation Act (FCA), 1980 and Environment Protection Act (EPA), 1986. The following authorities have important role in compliance with the provisions of the above Acts.

State Board of Wildlife (SBWL): It was constituted under Section 6 of WPA and is headed by the Chief Minister of the State as Chairman. The duty of SBWL is to advise the State Government in selection of areas to be declared as PA, deciding line of action for protection of PA and wildlife, etc.

National Board of Wildlife (NBWL): It is a statutory Board constituted under Section 5 of the WPA. The role of NBWL *inter alia* includes to make recommendations on the matters relating to restriction of activities in the PA.

Central Empowered Committee (CEC): It was constituted by the Hon'ble Supreme Court of India (SCI). Matters relating to implementation of WPA and FCA, including rules, regulations and guidelines framed there under on which the SCI has passed orders from time to time are referred to the CEC for recommendation to the SCI.

3.1.4 Organizational set up

Additional Chief Secretary, Government of Gujarat (GoG) is the head of the Forests and Environment Department (F&ED) who is assisted by two Principal Chief Conservators of Forests. The Principal Chief Conservator of Forests (Head of the Forest Force) is the functional head of the Forest Department.

To control, manage and maintain the PAs, the Principal Chief Conservator of Forests (PCCF) (Wildlife) is appointed under Section 4 of the WPA, 1972 who also acts as the Chief Wildlife Warden of the State. The Deputy Conservator of Forest (DCF) of the respective sanctuary acts as the Sanctuary Superintendent.

3.1.5 Scope of Audit

Audit examined the functioning of the Forests Department with regard to discharge of responsibilities for the protection of the PAs during the period 2012-13 to 2016-17. The scope of audit was limited to assess whether adequate measures were taken for conservation of Wildlife *vis-a-vis* protecting their habitat and, whether the activities within the Protected Areas were in compliance with WPA/ FCA and extant orders in this regard.

Based on the examination of the records relating to activities undertaken in PAs during 2012-17, the audit findings are discussed in succeeding paragraphs.

3.1.6 Creation of Eco-Sensitive Zone

Section 3 of the EPA, 1986 gives power to the Government of India (GoI) to take all measures that it feels necessary for protecting and improving the quality of the environment and preventing & controlling environmental pollution. Eco-Sensitive Zone (ESZ) is notified around a PA under Section 3 of the EPA, 1986 to regulate activities in the ESZ. An ESZ creates some kind of "Shock absorber" around PAs and acts as a transition zone from areas of high protection to areas involving lesser protection. The National Wildlife Action Plan² (2002-2016) provided for declaring identified areas around PA and corridors as ecologically fragile under the EPA, 1986, wherever necessary.

Process for notification of Eco-Sensitive Zones:

The notification of an ESZ goes through the following stages:

- The proposal for an ESZ around a PA is submitted by the State Government which is scrutinized by the MoEF&CC in consultation with the Wildlife Institute of India.

² National Wildlife Action Plan 2002-2016 as adopted by Indian Board of Wildlife (now NBWL) in 2002 was implemented by the MoEF&CC.

- The draft notification is finalized by the MoEF&CC and placed in public domain for 60 days seeking views of public.
- The views/ comments/ activities recommended by the public are compiled and considered by the Expert Committee of the MoEF&CC before finalizing the notification to be issued under the EPA, 1986.
- Final notification for an ESZ is to be issued within a period of 545 days for those proposals for which comments have been received from the public after the publication of draft notification.

Status of declaration of ESZ in Gujarat

As of July 2017, out of 23 WLS and four NPs, draft notifications for declaration of ESZ around the areas of 17 WLS and four NPs have been issued. Out of these, MoEF&CC has issued final ESZ notifications in respect of 10 WLS and three NPs. Proposals for issue of draft ESZ notification for six WLS was under consideration at different stages (**Appendix VI**).

Audit examined the records relating to proposal for ESZ notification and observations in respect of four PAs³ are as under:

3.1.6.1 Unjustified exclusion of Forest and Government waste land from ESZ

In December 2016, eight draft notifications of ESZ around 11 PAs⁴ were in public domain for inviting representations of the public. Audit observed (April 2017) from the records that a meeting was held on 28 November 2016 between the group of Ministers of State Government, District representatives and affected persons to get objections on the eight draft ESZ notifications. In the meeting, a decision was taken to finalize the area of the ESZ based on representations of the stakeholders. Accordingly, the PCCF (WL) issued an internal circular on 07 December 2016 and directed its field officials to prepare revised proposals for these eight draft notifications based on specific criteria of distance from the boundary of the protected area and exclusion of certain villages.

Audit test checked three proposals (Velavadar Black Buck NP, Nalsarovar Bird sanctuary and Hingolghadh Nature Education Sanctuary) for final ESZ notification. Details of ESZ area as per draft/ initial proposal and as per proposal for final ESZ notification in respect of these three PAs are given in **Table 1** below:

³ (1) Velavadar Black Buck National Park (2) Nalsarovar Bird Sanctuary, (3) Hingolghadh Nature Education Sanctuary and (4) Narayan Sarovar Wildlife Sanctuary.

⁴ (1) Gir PA (Gir NP, Gir WLS, Paniya WLS and Mitiyala WLS), (2) Barda WLS (3) Velavadar Black Buck National Park, (4) Nalsarovar Bird sanctuary, (5) Khijadiya WLS, (6) Gaga WL Sanctuary, (7) Porbandar Bird Sanctuary and (8) Hingolghadh Nature Education Sanctuary.

Table 1: ESZ area as per proposal for draft and final ESZ notification

Name of the PA and status of ESZ notification	Type of proposal and date	Forest land	Revenue Land	Government waste land/ gauchar land	Total
Nalsarovar Bird Sanctuary (Final notification issued in June 2017)	Draft notification (December 2015)	358.65	35,376.33	30,216.02	65,951
	Proposal for final notification (December 2016)	35.47	31,756.53	0.00	31,792
	Reduction in percentage	90	10.23	100	51.79
Hingolghadh Nature Education Sanctuary (Final notification issued in June 2017)	Draft notification (December 2015)	2,971.53	2,101.44	1,434.99	6,507.96
	Proposal for final notification (December 2016)	379.86	1,610.19	1,176.72	3,166.77
	Reduction in percentage	87.22	23.38	18.00	51.34
Velavadar Black Buck National Park (Final notification issued in July 2017)	Draft notification (December 2015)	63,760	41,834	24,558	72,768
	Proposal for final notification (February 2017)	633		3,724	4,357
	Reduction in percentage	99		94.39	94.01

As seen from the **Table 1**, there were reductions in the areas in the final notification for ESZ ranging from 51 to 94 *per cent*. Audit noticed that the proposals of draft ESZ notification were based on the MoEF&CC guidelines. These proposals were prepared keeping in view the detailed and scientific studies of habitats and corridor of wildlife. It was further observed that the areas of forest land was reduced from 87 to 99 *per cent* in the above cases. Since forest areas are already regulated under FCA, 1980 reduction in the same lacked justification.

Audit scrutiny further revealed that no representation was received for reduction in ESZ area for forest land and government waste land because the Government itself was its custodian. It was also noticed that MoEF&CC while issuing final ESZ notification stated that there was no objection/ representation from stake holders in case of above ESZ. Despite this, in the final ESZ notification, forest land and government waste land was reduced.

Audit is of the view that shrinking of the ESZ area consisting mainly of the government waste land and forest land, may jeopardise the long term efforts for wildlife conservation and in turn adversely impact environment as regulation of environment affecting activity would not be possible in areas excluded from ESZ.

Reply of the PCCF (WL) was awaited (December 2017).

3.1.6.2 Non-compliance with conditions of final ESZ notification

The MoEF&CC issued final ESZ notification in May 2012 for the Narayan Sarovar Wildlife Sanctuary (NSWLS). As per the conditions of the notification, the State Government had to prepare a Zonal Master Plan within two years of the notification. Further, in the notification, MoEF&CC also provided framework for constitution of a Monitoring Committee (MC) having not more than 10 members. The District Collector was responsible for compliance of the conditions of the ESZ notification.

Audit scrutiny (May 2017) revealed that even after five years of ESZ notification, the Zonal Master Plan had not been prepared and MC was not constituted. The DCF, Kachchh (West) suggested three NGOs in March 2017 for appointment as members of the proposed MC but their approval from the F&ED was awaited (May 2017). Further, it was also observed that though the GoG had instructed (October 2012) the Collector, Bhuj to take cognizance of the terms and conditions of the ESZ notification, instructions in this context were passed on to the Deputy Collectors only in September 2015 by the Collector, Bhuj. Non-preparation of Zonal Master Plan and non-constitution of the MC may lead to non-regulation of the activities in the notified ESZ area.

Reply of the PCCF (WL) was awaited (December 2017).

3.1.7 Non-declaration of new Protected Areas for Asiatic Lion

The population of Asiatic Lions has increased from 205 in 1979 to 523 in 2015. Further, the number of lions within the Gir PA was 308 in 2011 which increased to 356 in 2015 (15.6 *per cent*). This increase exerts pressure on the Gir PA, which is the home to these lions. Further, lions being territorial animals, their increasing population have led them to discover and adopt new habitats outside the Gir PA⁵. It is evident from the fact that the number of lions outside the Gir PA was 108 in 2011, which increased to 167 (54.6 *per cent*) in 2015.

The proposal submitted (March 2016) for draft Eco Sensitive Zone (ESZ) notification for Gir PA also reports that the latest census should be taken as a sign of warning as nearly one-third *i.e.*, 32 *per cent* of the lions have their habitat outside the Gir PA, risking human lives, livestock as well as the safety of the lions themselves.

In view of the rising population and high instances of death of lions⁶ outside the Gir PA during 2012-13 to 2016-17, creation of new PAs was one of the available options with the F&ED. Audit examined the efforts made by F&ED in expanding the PA for Asiatic Lions.

As part of plans to identify new PA/ CR in Gujarat, the CCF (WL), Junagadh proposed (November 2005) to declare 30,152.32 ha of villages of Palitana, Mahuva, Talaja, Khamba and Savarkundla talukas of Bhavnagar and Amreli

⁵ Girnar, Gir, Paniya and Mitiyala Sanctuaries and Gir National Park.

⁶ Death due to natural reason within the Gir PA-175 and outside the Gir PA-106 and death due to unnatural reasons within the Gir PA-2 and outside the Gir PA-21.

district as a “Sir Dharam Kumar Singh Ji Wildlife Sanctuary” to provide a safe corridor for the lions moving out of the Gir PAs.

After deliberations with the PCCF (WL), the proposal was modified (August 2006) and it was decided to declare the areas as a CR. Revised proposal for reduced area of 11,155.18 ha was submitted (June 2007) which was further reduced (October 2010) to 10,953 ha. The F&ED informed (November 2010) the PCCF (WL) that the proposal of declaring the CR was under consideration and further directed to initiate the procedure of transferring 4,811.51 ha government waste land of Amreli district in favour of the F&ED.

Audit observed (May 2017) that the Revenue Department was approached (November 2010) for transfer of government waste land in favour of F&ED. Despite protracted correspondence between F&ED and the Revenue Department, the same has not been transferred (May 2017). Thus, the declaration of the lion habitat area as CR is pending despite lapse of more than 11 years.

The fact remained that the last extension of habitat for lion was approved by the MoEF&CC in 2008 *viz.*, Girnar WLS (area of 178.87 sq km). Despite increase in population of lion during 2011-15 by 54.60 *per cent* outside the Gir PA and high instances of death of lions, no new protected habitat for lions has been approved.

3.1.8 Implementation of Modern Technology for the Conservation of Asiatic Lion

Introduction of modern technology for the conservation of Asiatic Lion was part of the Management Plan of the Gir PA. After the poaching of seven lions in March 2007, the F&ED constituted (May 2007) a Task Force⁷ to explore the use of modern technology to stop recurrence of such incidents. The Task Force proposed (November 2007) following integrated solutions for enhancing conservation efficiency by incorporating modern technology.

1. GPS based tracking of surveillance, animal and vehicles in Gir PA.
2. Automated Sensor Grid (Magnetic Sensor and Movement Sensor).
3. Genome Mapping and Conservation (establishment of gene pool population and genetic laboratory and cryopreservation of genetic material) of the Asiatic Lion.
4. Night Vision Capability Enhancement.

Audit’s observations on implementation of projects for introduction of modern technology for conservation of Asiatic Lion are discussed below.

⁷ Consisting members from Wildlife Institute of India, Dehradun; Professor from DA-IICT; Director, BISAG; PCCF (WL), CCF (WL), Junagadh and CCF (Research).

3.1.8.1 Slow implementation of LEOGEN Project

One of the recommendations of the task force was launching of a project for Genome Mapping and Conservation of Asiatic Lion. The Task force also suggested setting up a laboratory that would have facilities for cryopreservation, DNA sequencing *etc.* It also recommended development of specification for such laboratory in consultation with Gujarat State Bio Technology Mission (GSBTM)⁸ and other organisations⁹.

F&ED constituted (December 2009) Gujarat Wildlife Genomics and DNA Banking Facility and signed (January 2010) a Memorandum of Understanding (MoU) with GSBTM. However, project actually commenced only from May 2014. Within a year of commencement of the project, the F&ED cancelled (May 2015) the MoU entered with GSBTM and entrusted (May 2015) the implementation of the project to the Gujarat Forestry Research Foundation (GFRF)¹⁰ and renamed the project as “Wildlife Genomics Research Project (LEOGEN)”.

Audit observations relating to the project are as under:

- Since commencement of the project (May 2014), work on only two out of six activities had been attempted (July 2017). Work on diagnostic core was not started though the incubator for this purpose was purchased in November 2013. The project had, therefore, been restricted to genetic data sampling.
- Specifications for laboratory were also not prepared.
- Despite the fact that the GFRF did not have expertise in the field of scientific research on genomics which was the core requirement of the project, the project was transferred to the GFRF.
- There was no permanent technical staff in GFRF to run the project.
- To run the Project, the F&ED was to re-constitute four functional committees which were not constituted till June 2017.

The Director, GFRF justified (May 2017) transfer of the project from GSBTM on the grounds that it made collection of samples easy in the WLS and NPs. However, the justification was not tenable as the collection of sample was not the objective of the project. However, Audit observed that the Director, GFRF himself reported (November 2015) to the F&ED that the project had come to a standstill.

Thus the progress of the project was slow despite availability of funds for the reasons stated above.

⁸ An institute under the aegis of the Science and Technology Department, GoG.

⁹ Veterinary College; Anand and Centre for Cellular & Molecular Biology, Hyderabad.

¹⁰ An Autonomous Body under the Forests and Environment Department.

3.1.8.2 Wasteful expenditure on purchase of Forensic Mobile unit

The GSLCS purchased (June 2008) a Forensic Mobile Unit (the Unit) for forensic science investigation at a cost of ₹ 0.25 crore and placed it under the control of the Deputy Director, Forensic Science, Junagadh upto 2009-10. Due to lack of necessary staff required for operating it, the Unit was shifted (April 2010) to the Sakkarbaug Zoo. Later on, it was shifted (April 2014) to the Wildlife Division, Sasan-Gir, Junagadh and remained there (July 2017). Between January 2010 and August 2014, the Unit was used on 37 occasions only and that too for non-forensic use. A later decision (July 2015) to shift it to Deputy Director, Forensic Science, Junagadh was not accepted by that office.

Audit observed (January 2017) that the Unit could not be utilized for forensic science due to its size which was detrimental to its mobility in the forest area. The forensic equipment has been kept in veterinary hospital at Sasan-Gir. As there was no utility of the Unit, contract of one technical officer and attendant was not renewed (June 2015).

The MS, GSLCS stated (February 2017) that the Unit was being used for training in forensic crime at site, rescue and care of the wildlife in Devaliya Interpretation Park.

The fact remained that the Unit was purchased without proper assessment of its utility.

3.1.8.3 Construction of chain link fencing along railway tracks

Three railway tracks (Section A, B and C)¹¹ pass through the areas inhabited by the lions in Amreli district. During 2012-14, there were five cases of lion casualty on the above tracks. To control the accidental death of lions on the tracks, it was decided (October 2014) by the Railway authorities and the F&ED to take long term and short term measures. Short term measures included deployment of trackers and long term measures included construction of underpasses and fencing of entire railway track on both sides to ensure that the Asiatic Lions are not able to reach the railway tracks. To implement the long term measures, an expenditure of ₹ 25.35 crore was incurred upto June 2017 on fencing. The work in Section 'A' was completed in March 2016 and works of Sections 'B' and 'C' were at various stages of completion (March 2017).

Audit scrutiny (March 2017) revealed that the DCF, Social Forestry, Amreli and CCF, Social Forestry, Rajkot reported (September 2016) to the PCCF (WL) that lions entered fenced area on eight occasions and raised doubts over its effectiveness in controlling the movement of lions on railway tracks. Thus, fencing of the railway tracks, though a major step for conservation of wildlife, had not succeeded in preventing movement of lions on track.

¹¹ Section A, Pipavav- Rajula; 14 Kilometer; Section B Rajula- Savarkundla; 16 Kilometer; Section C, Rajula – Mahuva; 17 Kilometer.

To examine the effectiveness of the measures undertaken and the need of further action required, PCCF (WL) constituted (October 2016) a Committee of experts¹² from the field of Wildlife. The Committee recommended use of modern technology like GPS based tracking, virtual fencing camera with siren, SMS alert facilities to the loco drivers, *etc.* Audit observed that though the recommendations were made in October 2016, no further action for implementation of these technologies was taken by the F&ED. In reply, the DFO, Social Forestry, Amreli stated (May 2017) that success of use of such costly technology was doubtful.

3.1.9 Approval of Activities and Diversion of Land in PAs

Use of PA such as carrying out any permitted activity including diversion of land is regulated under Section 29 of the WPA. Such proposal is submitted by the PCCF (WL) to the SBWL. The SBWL recommends the proposal to the NBWL. The NBWL files an application before the CEC of the SCI for consideration of the proposal. After examination, the CEC recommends the proposal to the SCI for permitting the use of sanctuary land subject to fulfilment of conditions mentioned therein. The SCI approves the proposals. Since October 2015, the SCI has empowered the NBWL to grant permission for use of PA on its own merits and in conformity with the orders and directions passed by the SCI from time to time. Further, if the diversion of land of PA involves forest land, necessary permissions have to be obtained under FCA, 1980.

The SCI/ NBWL had approved (between February 2008 and August 2016) 44 proposals to undertake permitted activities in PAs of Gujarat. Of these, instances of violation of the provisions of Section 29 of the WPA and non-compliance of conditions of approvals noticed during test check are discussed below:

3.1.9.1 Unauthorised establishment of windmills in Wild Ass Sanctuary, Dhrangadhra

The Ministry of Environment, Forests and Climate Change (MoEF&CC), GoI issued (May 2004) guidelines that prohibit use of forest land of NPs and WLS for wind energy projects.

Audit observed (April 2017) that Vestas Wind Technology India Private Limited, Ahmedabad (the user agency) applied to the PCCF (WL) in January 2007 for use of 3.72 hectare (ha) forest land of Wild Ass Sanctuary (WAS), Dhrangadhra for establishing seven windmills. The SBWL and NBWL approved the proposal in September 2008 and July 2009, respectively. However, the CEC rejected (May 2013) the proposal on the grounds that the proposal was from a private enterprise for commercial exploitation of forest land and was not a site specific project. The CEC recorded that 135 windmills were already functioning in the area and all were located outside the boundary of the Wild Ass Sanctuary.

¹² Expert committee consisted of CCF of concerned circles; Representative of Essar Company Limited; Jamnagar, Digitron India, Jamnagar; Security Officer, Pipavav Port and Railway Supervisor, Savarkundla.

Subsequent to amendment in process of obtaining permission (October 2015), the PCCF (WL) accorded sanction (December 2015) for establishment of these seven windmills in the Sanctuary. It was recorded in the sanction that the Member Secretary, CEC directed telephonically (November 2015) to implement the order of the SCI and issue permissions based on the decisions taken on merits by the NBWL in the pending cases. The DCF, WAS, Dhrangadhra confirmed (April 2017) that the user agency had completed the work.

Audit is of the view that since there was no change in the extant orders of the CEC, subsequent grant of approval (December 2015) without any recorded reasons for change in the ground position was not correct and tantamount to violation of the WPA, 1972.

Reply of PCCF (WL) was awaited (December 2017).

3.1.9.2 Execution of work in Sanctuary area without prior permission

In order to evacuate power and further transmission from its Ultra-Mega Power Projects (UMPP) located at Mundra, the Adani Power Limited (APL) required diversion of 58.968 ha (18.20 ha forest land and 40.768 ha non-forest) of WAS, Dhrangadhra for laying Mundra-Dehgam transmission line. For this, APL was required to obtain prior permissions under FCA, 1980 and WPA, 1972.

APL applied (January 2009) for diversion of forest land under FCA, 1980. During the field inspections, the F&ED noticed (March 2009) that APL had laid the transmission line without getting requisite permission. APL stopped the work (March 2009). Subsequently, MoEF&CC granted (May 2009) in-principle approval for diversion of forest land under FCA, 1980. Audit noticed from the orders of the Central Electricity Commission (in petition no. 184/TT/2013 dated 18 December 2013) that APL had commissioned the transmission line in July 2009.

Audit also observed that APL had applied in May 2009 for diversion of Sanctuary land (forest and non-forest) under Section 29 of the WPA 1972 *i.e.*, after it had started the work in January 2009. The same was granted by PCCF (WL) in September 2010 *i.e.*, around 13 months after the commissioning of the transmission line in July 2009. Thus, APL did not requisite permissions obtain under WPA before the start of the work in January 2009.

APL paid (July 2013) the Net Present Value¹³ (NPV) required for diversion of the forest land. The F&ED, GoG proposed (November 2014) final approval for diversion of forest land to MoEF&CC with a condition to levy penal NPV.

¹³ In respect of forest land falling within NP and WLS, the amount of NPV was equal to 10 times and five times, respectively of the NPV for the adjoining area as per Annexure-I of the GR of September 2008. In respect of non-forest land falling within marine national park/ wildlife sanctuary, the amount was five times of the NPV payable for the adjoining area as per Annexure-I of the GR. The use of non-forest land falling within NP and WLS was permitted on payment of an amount equivalent to the NPV payable for the adjoining area as per Annexure-I of the GR.

However, MoEF&CC directed (May 2015) GoG to enquire into the matter of use of forest land for non-forest purpose without obtaining prior approval of the GoI. It also directed to forward draft complaint against persons *prima facie* found guilty for violation of FCA, 1980 within a month. Audit observed that no action on MoEF&CC instructions had been taken even after a lapse of two years (May 2017) and final approval from MoEF&CC was still pending (December 2017).

Thus, APL laid transmission line in violation of provisions of WPA, 1972 and FCA, 1980 and prior to obtaining the requisite permissions under the *ibid* Acts.

Reply of PCCF (WL) was awaited (December 2017).

3.1.9.3 Non-recovery of NPV and project cost of diversion of sanctuary land

As per F&ED, Government Resolution (September 2008), NPV is recoverable from the user agencies in the event of diversion of land of WLS and NP for non-forest purposes. In addition to the NPV, five *per cent* of the cost of the project (passing through the WLS and/ or NP) is to be recovered for conservation and management of wildlife prior to commencement of the permitted activity. The funds so collected are to be credited to the Compensatory Afforestation Fund Management and Planning Authority.

The 44 proposals approved by the SCI/ NBWL from February 2008 to March 2017 involved diversion of 1,134.0283 ha land (forests as well as non-forests) of WLS and NPs in Gujarat. Keeping in view the area of land diverted and purpose of diversion, Audit test-checked 10 sanctions and noticed cases of non-recovery of NPV and five *per cent* of the cost of the project due to non-inclusion of the conditions for recovery of NPV and amount of five *per cent* of the project cost. A summary of these cases is given in **Appendix VII**.

Audit noticed that the F&ED recovered NPV in two cases *viz.*, Dedicated Freight Rail Corporation of India (DFRCI), Ajmer and Rail Development Corporation India Limited (RDCIL). However, the NPV of ₹ 38.98 crore was not recovered (July 2017) in the remaining eight cases¹⁴.

Similarly, it was also observed that F&ED recovered five *per cent* of the project cost in only three cases out of the 10 *i.e.*, Adani Power Limited (APL), Gujarat Energy Transmission Company Limited (GETCO) and Oil and Natural Gas Corporation Limited (ONGCL). However, ₹ 3.69 crore was not recovered in three cases¹⁵ though the works were either completed or were under progress. In remaining four cases¹⁶ audit could not compute the recoverable amount due to non-mentioning of project cost in the proposals.

¹⁴ GETCO (two cases), ONGCL, Power Grid Corporation India Limited (PGCIL), SSNNL, Vodafone Essar, Vestas Wind Technology India Private Limited and APL.

¹⁵ DFRCI, RDCIL, PGCIL.

¹⁶ SSNNL, Vodafone Essar, GETCO and Vestas Wind Technology India Private Limited.

On being pointed out in audit, the respective DCFs issued (July 2017) demand notices in five cases¹⁷. In respect of APL, the DCF, WAS, Dhrangadhra issued (July/ September 2017) demand notice for payment of ₹ 3.81 crore towards NPV and project cost. In respect of Sardar Sarovar Narmada Nigam Limited (SSNNL), the diverted land fell under the jurisdiction of two DCFs viz., DCF, WAS, Dhrangadhra and DCF, Kachchh (East). While, the DCF, WAS, Dhrangadhra issued (July 2017) demand notice (₹ 4.28 crore), the DCF, Kachchh (East) did not issue demand notice to SSNNL (July 2017).

Reply of PCCF (WL) was awaited (December 2017).

Non-inclusion of mandatory conditions in the sanction order and failure to serve demand notice for recovery of NPV and five *per cent* of the project cost indicate weakness of internal control. It also indicates non-monitoring of use of sanctuary land and sanctions orders at the PCCF (WL) level being the Chief Wildlife Warden of the State.

3.1.9.4 Non-compliance with mitigation measures in laying of transmission lines

For evacuation of power from ultra-mega power projects (UMPP) at Mundra and further transmission to the end users, high voltage transmission lines were laid by APL, GETCO and PGCIL. The geographical location of these UMPP was such that every transmission line had to cross Little Rann of Kachchh (LRK). LRK is the nesting ground of the lesser and greater flamingos and also a stopover in their international migration route. These birds were prone to collision and electrocution with transmission lines.

The MoEF&CC also issued guidelines (May 2014) emphasising use of insulated conductors to prevent electrocution of birds. The sanctions for laying of transmission lines across LRK were granted subject to the condition of installing reflector or use of insulated cables.

Audit observed that there was no system to monitor compliance of conditions laid down in the sanction for laying transmission lines by the user agencies. In the absence of monitoring mechanism, compliance to the conditions (installation of reflectors, perch detector and insulated conductors) could not be ensured.

Audit called (May 2017) for compliance report of the mitigation measures taken. DCF, WAS, Dhrangadhra confirmed (June 2017) that mitigation measures were not implemented. In the absence of mitigation measures, life of flamingos as well as other birds was at threat while flying through these areas.

3.1.10 Conclusion and Recommendations

Wildlife conservation efforts in Gujarat have yielded positive results as indicated by the increasing number of Asiatic Lions from 308 in 2011 to 356 in 2015. This increase exerts pressure on the existing PAs. Despite this, no new protected habitat for lions has been approved since 2008.

¹⁷ GETCO (two cases), PGCIL, SSNNL, Vestas Wind Technology India Private Limited.

Audit also observed that while notifying the ESZ around three PAs, the area of forest land and government wasteland was reduced considerably, which lacked justification. The implementation of modern technology for the conservation of Asiatic Lion was very slow. Audit also observed instances of allowing prohibited activities within the protected areas and not ensuring compliance with conditions subject to which certain projects were permitted within the Protected Areas.

The Government may:

- *implement projects for introduction of modern technology for conservation of Asiatic Lions as recommended by the Task Force.*
- *ensure regulation of activities within Protected Areas in compliance with the provisions of Wildlife Protection Act, 1972 and Forest Conservation Act, 1980 and directions of MoEF&CC.*

NARMADA, WATER RESOURCES, WATER SUPPLY AND KALPSAR DEPARTMENT

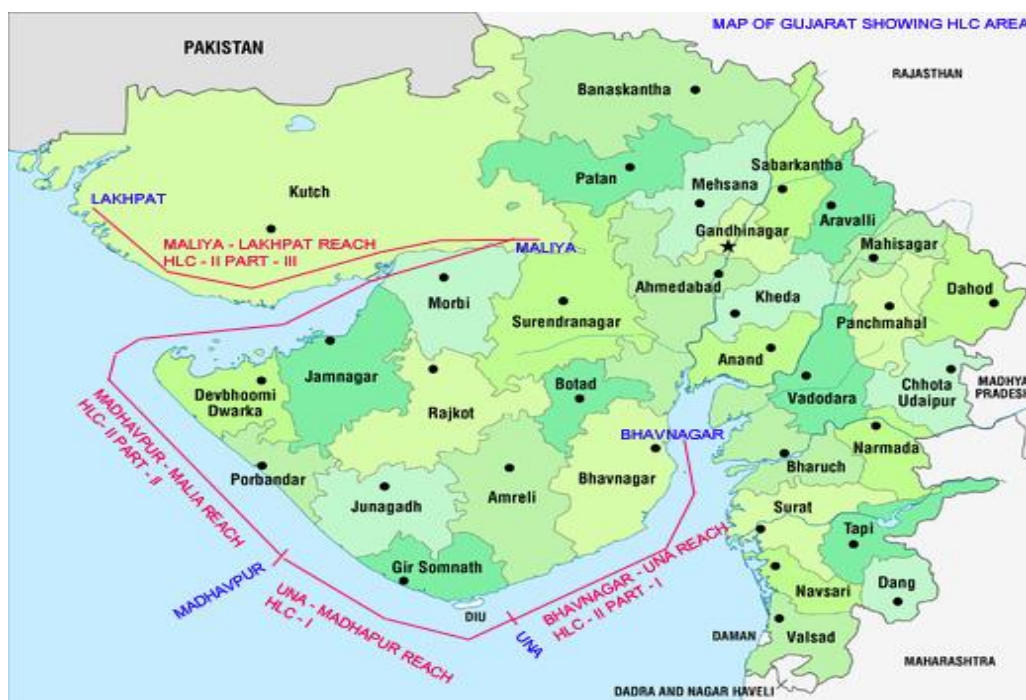
3.2 Salinity Ingress Prevention Scheme

3.2.1 Introduction

Gujarat has a coastline of more than 1600 km, which is about one-third of the total coastline of India. Of this, Saurashtra and Kachchh cover 1,125 km from Bhavnagar to Lakhpat. Due to excessive withdrawal of water for irrigation, irregular and very low precipitation, highly porous geological formations, low natural recharge and poor land management; sea water had ingressed towards land. This has affected the lives of the people by making the available ground water saline rendering it unsuitable for irrigation and drinking purposes. Further the cultivable land had also transformed into saline land making it unfit for agriculture. The Government of Gujarat (GoG) therefore appointed two High Level Committees (HLCs) in 1976 and 1978 to study the problem of salinity ingress and suggest appropriate remedial measures.

3.2.2 Reports of High Level Committees

The first HLC was appointed in 1976 and submitted its report in 1978 which was accepted by the GOG in the same year. This HLC covered a 160 km stretch between Una and Madhavpur reach. The second HLC was appointed in 1978 and gave a report on 180 km Bhavnagar-Una reach in 1983 which was accepted by the GoG in 1984. The same HLC gave its report on 425 km Madhavpur- Maliya reach and 360 km Maliya- Lakhpat reach in 1984, which the GoG accepted in 1992.



Map showing reaches studied by HLCs

The Committees broadly classified their recommendations to check salinity ingress and manage it, under four techniques as depicted in **Table 2** below:

Table 2: Recommended techniques and the activities covered under each

Techniques	Activities covered
Management technique	Change in Cropping Pattern, Setting up Trial Cum Demonstration farms and Ground Water Regulation
Salinity control technique	Constructing Tidal Regulators and Bandharas
Recharge technique	Constructing Recharge Tanks, Recharge wells, Check dams, Spreading channels, Connecting channels, Afforestation and Gully and <i>Nalla</i> plugging
Coastal land reclamation	Constructing Coastal bund and Coastal land reclamation

Depending on the nature of activity, the HLCs recommended the number or length of structures to be created and area of land to be covered by each activity. The works done as per the recommendations of the HLCs are broadly referred to as the Salinity Ingress Prevention Scheme (SIPS), which is being implemented by Narmada, Water Resources, Water Supply and Kalpsar Department (the Department).

3.2.3 Scope of Audit

The audit of SIPS was done to assess the status of implementation of the recommendations of HLCs; planning, implementation and monitoring of various remedial measures undertaken during 2012-13 to 2016-17; and the impact of such interventions on the salinity ingress in all the four reaches covered by the HLCs.

Earlier a Performance Audit (PA) on this topic had featured in Audit Report No. 2 (Civil) for the year ended 31 March 2010. The PA recommended the

constitution of High Level Review and Monitoring Committee, enactment of ground water legislation, complete acquisition of land for smooth and effective implementation of works, construction of spreading channels to be taken up simultaneously with construction of Tidal Regulators/ *Bandharas* and completion of remaining works suggested by the HLCs. The recommendations made in the PA were also considered during this audit and are suitably commented in succeeding paragraphs. The PA is yet to be discussed in the Public Accounts Committee (December 2017).

The audit covers a period of five years from 2012-13 to 2016-17. The works under SIPS are being undertaken by the Salinity Ingress Prevention Circle (SIPC), Rajkot and Kachchh Irrigation Circle (KIC), Bhuj. There are five divisions including one Ground Water Division under SIPC, Rajkot and four divisions under KIC Bhuj. All the divisions except the Ground Water Division, Rajkot¹⁸ were covered under this audit.

3.2.4 Audit Findings

The Audit findings have been discussed under three broad headings: (i) Status of implementation of the HLCs recommendations, (ii) Planning, Implementation and Monitoring of the SIPS activities undertaken during 2012-13 to 2016-17 and (iii) Impact of the activities done for prevention of salinity ingress in these reaches.

3.2.5 Status of implementation of the HLCs recommendations

3.2.5.1 Non-completion of the remedial measures suggested by the HLCs

The reach-wise status of the remedial measures as of March 2017 *vis-a-vis* the recommendations of the HLCs is given in **Appendix VIII**. The HLCs recommended a period of seven to ten years for the completion of all the activities suggested. Considering the acceptance of the recommendations of HLCs by the GoG for implementation, all the recommended works should have been completed latest by 2002-03. Further, they had also suggested that activities coming within certain identified stretches should be given more priority and completed within three years. The details of activities to be covered and actually covered in such priority stretches are detailed in **Appendix IX**. The status as given in **Appendix VIII** is summarised in **Table 3** below:

¹⁸ The Ground Water Division is engaged in monitoring and maintenance of data related to water levels and quality of ground water in the observation wells. The relevant information was obtained through Circle offices.

Table 3: Status of implementation of HLCs recommendations as on March 2017
(in Numbers unless otherwise mentioned)

Particulars	Recommendations of HLCs	Recommendations completed	Percentage of stretch wise and overall completion				
			Una-Madhavpur	Bhavnagar-Una	Madhavpur-Maliya	Maliya-Lakhpat	Overall
Management Technique							
Trial cum demonstration (TCD) farms	79	0	0.00	0.00	NR	0.00	0.00
Salinity Control Technique							
Tidal regulator ¹⁹ (TR) and Bandhara ²⁰	180	100	105.88	37.84	19.72	98.18	55.56
Recharge Techniques							
Check dams ²¹ (CD)	1,575	1,358	241.33	71.33	60.65	92.43	86.22
Recharge Tanks ²² (RT)	122	41	71.43	70.00	10.00	36.00	33.61
Recharge Wells ²³ (RW)	1,480	1,244	99.00	30.00	9.41	564.67	84.05
Recharge Reservoir (RR)	43	18	NR	45.45	28.57	NR	41.86
Gully/ Nalla ²⁴ Plugging	85,400	4,487 ²⁵	NR	0.00	0.00	0.00	5.25
Spreading Channel ²⁶ and Connecting Channel ²⁷ (in Kms)	906	291	123.82	4.49	25.83	42.77	32.12
Afforestation (in Hectares (ha))	1,04,750	5,867	11.73	0.00	0.00	0.00	5.60
Raising of shelter belt (in ha)	4,900	0	NR	NR	NR	0.00	0.00
Improvement and afforestation of mangrove forest (in ha)	1,050	0	NR	NR	NR	0.00	0.00
Coastal Land Reclamation							
Coastal Bund (in Kms)	60	0	NR	NR	NR	0.00	0.00
Coastal Land Reclamation (in ha)	39,500	0	NR	0.00	0.00	0.00	0.00

(Source: Information provided by the Department)
NR means there were no recommendations in HLC report.

From analysis of the **Appendix VIII** and **Table 3** above, audit observed that except in case of check dams and recharge wells the progress of works was very slow. No action/ limited action was taken for establishment of TCD farms, coastal land reclamation, gully plugging and afforestation. Even the plan document, detailed project report and budget estimates were not prepared for these activities. Out of the four reaches, in Bhavnagar-Una and Madhavpur-Maliya reaches the overall progress of works was very slow. In respect of check dams and spreading channels the implementation in these reaches was between four to 71 per cent whereas in Una-Madhavpur reach these works had been done more than recommended. In Maliya-Lakhpat reach, as per the recommendation of the HLC, initially construction of 150

¹⁹ These are walls with regulating gates at the mouth of big rivers.

²⁰ These are walls with crest level above high tide level on small rivers.

²¹ These are constructed for creating small storages on existing rivers.

²² These are constructed for making use of local depressions filled by diverting surplus water.

²³ These are open wells filled with rubble, gravel and sand.

²⁴ These are plugging on small tributaries of the rivers/ nallas to arrest flood water and detain the same for larger duration for recharge and also conserve soil erosion.

²⁵ The activity was done in Una-Madhavpur reach wherein there were no recommendations hence percentage is nil in table.

²⁶ A channel constructed when recharge is desired along a narrow but continuous long area.

²⁷ Interlinking channels to connect two reservoirs, rivers or spreading channels.

recharge wells at an estimated cost of ₹ 10 lakh *per* well were proposed to the 13th Finance Commission. Subsequently considering the technical aspects and suggestion of the geologist, the estimated cost of each recharge well was reduced to around ₹ one lakh. Hence, due to reduction in cost, the number of recharge wells to be built was increased to cover more area. Therefore, the implementation was to the extent of 564.67 *per cent* of the works recommended. On the other hand, in Bhavnagar-Una reach and Madhavpur-Maliya reach these works were implemented only to the extent of nine to 30 *per cent*.

The measures coming within Meghal river Basin (Una-Madhavpur), Maleshri River Basin (Bhavnagar-Una), Kalipat River Basin, Ruparel River Basin and Machchhu River Basin (Madhavpur-Maliya) and Bhukhi River Basin, Kharod-Rajda River Basin and Kankavati River Basin (Maliya-Lakhpat) were to be given priority and completed within three years. However, in Bhavnagar-Una and Madhavpur-Maliya reach, the works were not completed even in these priority areas as on March 2017 as detailed in **Appendix IX**. In Madhavpur-Maliya, out of 111 structures recommended in the three priority areas, the implementation was to the extent of 22.52 *per cent* as only 25 structures had been implemented. The progress was very slow in case of recharge wells. In Una-Madhavpur and Maliya-Lakhpat reach most of the works were implemented more than recommended due to reduction in costs as mentioned in the preceding paragraph. In Bhavnagar-Una reach except for construction of check dams other activities remained incomplete.

The Department stated (October 2017) that the slow progress in Bhavnagar-Una reach was because of poor foundation strata with low bearing capacity and problems in private land acquisition. Further the progress in Madhavpur-Maliya reach was slow because the coastal reach of 360 kms out of the total length of 425 kms was subsequently declared to be within the boundaries of Marine National Park (MNP) in 1982. This has substantially restricted the activities.

Reply is not convincing as the HLCs recommendations for Madhavpur-Maliya reach were submitted in 1984 *i.e.*, after declaration of MNP in 1982. The same was approved by the GoG in 1992. The HLCs recommended suitable sites for the implementation of the activities based on the geology and geomorphology of the area and their field studies. Though detailed investigation of the individual suggested sites were not available in the report, the Department had sufficient time to work out the alternative plans or designs based on the problems encountered. The reasons do not explain the delay of 25 to 39 years in the implementation of the HLC recommendations.

3.2.5.2 Cost escalation due to delay in implementation of SIPS

The HLC-I estimated the cost of the proposed structures and remedial measures for the Una-Madhavpur reach at ₹ 64 crore while HLC-II estimated the cost for Bhavnagar-Una, Madhavpur-Maliya and Maliya-Lakhpat reaches at ₹ 168.70 crore, ₹ 370.42 crore and ₹ 186 crore respectively. As against the original cost of ₹ 789.12 crore estimated by the HLCs, a total expenditure of ₹ 1,045.65 crore had been incurred upto March 2017. For the remaining

works the estimate has been revised to ₹ 2,544.79 crore. Thus, due to delay in implementation of the recommended works, the cost of the scheme has escalated by 455 *per cent*.

The Department (October 2017) stated that out of the escalation of 455 *per cent* in the estimated cost, 368 *per cent* was because of inflation during the said period. Further as HLC was constrained by time, it had considered lumpsum cost for the recommended structures. When actual costs were worked out after detailed survey, design and investigation, these were much higher.

Reply is not convincing as any time lag in implementation is bound to escalate the cost due to inflationary pressures. Implementation of activities within given time frame is essential to prevent inflationary impact and timely achievement of intended objectives. Even if cost estimates of HLCs were not detailed then the Department should have undertaken revision in estimates based on detailed survey and appraised the Government accordingly.

3.2.6 Planning, Implementation and Monitoring of the SIPS activities undertaken during 2012-13 to 2016-17

The HLCs suggested the remedial measures to be undertaken on a high priority basis in a time bound manner and recommended a period of seven to 10 years for their completion. The HLCs also recommended constitution of a High Level Review and Monitoring Committee comprising experts from the various disciplines *viz.*, irrigation, agriculture, forest, soil conservation, ground water, public health, planning and finance to monitor and periodically review the progress made in implementation of the scheme and to suggest modifications, if found necessary. The Audit Report No. 2 (Civil) for the year ended 31 March 2010 had recommended constitution of the Review and Monitoring Committee. The Department intimated (June 2017) that no such Committee has still been formed.

On being requisitioned for the overall planning undertaken for implementation of the HLC recommendations, the Department stated (June 2017) that while submitting proposals for financial assistance to Central Government under 12th and 13th Finance Commission, comprehensive programme was chalked out for implementing the recommendations by including schemes based on technical merit. However, no documentation suggestive of any road map for achievement of the recommendations within the stipulated time frame was furnished to audit. As regards planning for individual activities under each recommendation of the HLC, Audit observed that these were planned by the concerned implementing divisions of the Department. For this, before undertaking the activities, the concerned divisions were required to plan for the project by conducting site survey and studies for assessing the technical viability. Thereafter, a proposal for the project containing the details of land requirement, status of land acquisition, fund requirement and the intended benefits was submitted to the GoG, based on which administrative approval and budgetary allocations were made. This was followed by acquisition of

required land, preparation of detailed drawings for the works, inviting tenders, awarding the works and finally implementing them.

Thus, there was no holistic planning in terms of the time frame required to complete the scheme as a whole, fund requirements for the implementation of the entire scheme based on detailed investigation and requirement of land for completion of the whole scheme. Due to lack of overall holistic planning for implementation of the SIPS, individual recommendations of HLCs were planned and implemented on piece-meal basis. Consequently, as referred in **Paragraph 3.2.5.1**, except in case of check dams and recharge wells the progress of other activities was very slow and no action was taken for establishment of TCD farms and raising of shelter belts. On the other hand, limited action was taken for construction of tidal regulator and *bandhara*, coastal land reclamation, gully plugging and afforestation.

The Department stated (October 2017) that the time frame of seven to 10 years recommended by HLC was based on a preliminary survey, whereas actual implementation encountered many bottlenecks which hindered the progress of the works. The works under SIPS picked up only after funds were available under 12th and 13th Finance Commission.

The reply confirms that there was lack of holistic planning for implementation of SIPS.

3.2.6.1 Overall financing of the SIPS activities

The details of the budget provisions and expenditure incurred by the Department in SIPS during the period 2012-13 and 2016-17 are shown in **Table 4** below:

Table 4: Budget provisions and expenditure incurred relating to SIPS activities

(₹ in crore)

Year	Budget provision	Final Modified Grant	Expenditure incurred	Excess (+)/Savings (-) with reference to budget provisions and in terms of percentage	
				in absolute terms	in percentage
2012-13	105.70	68.51	66.73	-38.97	(-36.87)
2013-14	85.70	65.76	62.97	-22.73	(-26.52)
2014-15	96.50	124.95	61.81	-34.69	(-35.95)
2015-16	26.41	32.22	32.78	+6.37	(+24.10)
2016-17	64.97	13.23	13.07	-51.90	(-79.88)

(Source: Information furnished by the department)

As seen from **Table 3 and 4**, though the SIPS activities recommended by HLCs were incomplete and funds were available under budgetary allocations, the Department did not incur expenditure even to utilise the available budgetary allocations. In absolute terms the expenditure on SIPS decreased during 2012-13 to 2016-17.

The SE, SIPC Rajkot and SE, KIC, Bhuj stated that the savings were due to improper initial estimates, delays in approvals and sanctions as well as slow progress in execution of works.

The above allocations also included an amount of ₹ 150 crore recommended by the 13th Finance Commission (FC) as grant-in-aid for salinity ingress under State Specific Needs. The conditions prescribed for release of instalments were not satisfied by the department fully leading to release of only ₹ 116.98 crore as depicted in **Table 5** below:

Table 5: Details of utilization of grant received under 13th FC

(₹ in crore)

Year	Instalment of 13 th FC to be released as per action plan	Instalment available for utilization during the year			Details of utilization of grant
		Instalment released during the year	Carry forward of unutilized grant	Total grant available for utilization	Grant utilized upto 31 March of the year
2011-12	31.61	31.61	0	31.61	17.69
2012-13	42.07	42.07	13.92	55.99	24.51
2013-14	43.30	0	31.48	31.48	24.20
2014-15	33.02	43.30	7.28	50.58	50.09
2015-16	0	0	0.49	0.49	0.49
Total	150.00	116.98			116.98

(Source: Information received from Department)

As noticed from **Table 5**, the third instalment of ₹ 43.30 crore due in 2013-14 was not released by GoI due to utilisation of only 25 per cent (₹ 10.59 crore²⁸ out of grant of ₹ 42.07 crore) of the second instalment upto March 2013 as against the minimum laid down utilisation of two third of the instalment. The third instalment was subsequently released in 2014-15 and consequently the fourth instalment of ₹ 33.02 crore, which was to be released in 2014-15 was not released and hence lapsed. Thus, due to non-utilisation of available funds in time and consequent lapse of the fourth instalment of the 13th FC grant, the GoG was deprived of the central assistance of ₹ 33.02 crore towards prevention of salinity ingress.

The under-utilisation of 13th FC grant received from GoI was attributed to inclusion of some schemes in the 13th FC proposal, which were at advance stages of investigation/ design/ estimates. However, later some of these schemes were dropped and others were added based on merit. Further there were delays in obtaining no objection certificate from Coastal Regulation Zone and Forest Authorities.

Audit also observed that in four divisions²⁹ under SIPC, Rajkot, involving 14 works to be executed under 13th FC grant-in-aid, funds of ₹ 30.65 crore were transferred to Executive Engineer (EE), Irrigation Mechanical Division No.6, Rajkot as deposits between March 2012 and March 2015 and shown as grant utilisation in the transferring divisions. Out of this, an amount of ₹ 25.69 crore was subsequently received back by the transferring divisions from the mechanical division between May 2012 and June 2014 and shown as deposits received for executing works from other divisions. The remaining

²⁸ Difference of grant of ₹ 24.51 crore utilised in 2012-13 and carry forward of unutilised grant of ₹ 13.92 crore of 2011-12.

²⁹ Salinity Control Division (SCD), Rajkot (4 works), SCD, Porbandar (6 works), SCD, Jamnagar (3 works) and SCD, Bhavnagar (1 work).

amount of ₹ 4.96 crore was still lying (March 2017) with the Mechanical Division No.6, Rajkot.

The Department confirmed (October 2017) that the funds were transferred to utilize the grant received from 13th FC. Also as mentioned in the preceding paragraph the Department stated that the works under SIPS picked up only after funds were available under 12th and 13th Finance Commission.

This shows that there was no physical and financial planning for completion of the scheme within a certain timeframe. Even when the funds were available with the Department under 12th and 13th Finance Commission it could not fully utilize them. The funds were diverted to show the utilisation of grant and to receive subsequent instalment. This resulted in erroneous booking of expenditure and irregular parking of funds, apart from the planned activities not being completed.

The observations in relation to planning, implementation and monitoring of the SIPC activities for the period 2012-13 to 2016-17 based on a test check of 105 out of the 265 works executed during the period are discussed under the four techniques viz., Management technique, Salinity control techniques, Recharge techniques and Coastal land reclamation.

Management Techniques

3.2.6.2 Change in cropping pattern and establishment of Trial Cum Demonstration (TCD) Farms

The HLCs suggested change in cropping pattern by persuading the farmers to opt for crops requiring lesser quantity of water and which could resist salinity. It also emphasized educating the farmers in growing selected crops for its effective implementation. The techniques proposed to be adopted were to be tested in small representative areas termed as Trial Cum Demonstration (TCD) farms and demonstrated to the cultivators by organising short term training programmes.

As shown in **Table 3**, against 79 TCD farms recommended by the HLCs, no TCD farms have been established in any of the four reaches (March 2017). The information on existing cropping pattern and changes if any, was not available with the Department.

The Department (October 2017) stated that the establishment of TCD farms pertains to Agriculture Department. It was further added that the Government had developed seven TCD farms/ research stations which were working under State Agriculture Department and Agricultural University, Junagadh. The SE KIC Bhuj stated (May 2017) that the problems of the farmers were being solved during *Krushhi Mela* held every year by the scientists from the Agricultural University.

The replies are not correct as the seven TCD farms mentioned therein are research stations of Agriculture University Junagadh established between 1852

and 1966 *i.e.*, much before the constitution of HLCs. The Agriculture Department also denied (April 2017) the establishment of any TCD farms or conduct of any training activity under the SIPS. Thus the fact remains that no TCD farms were established in the four reaches despite the recommendations of the HLCs.

3.2.6.3 *Non-enactment of ground water legislation*

The HLCs recommended in 1978 the enforcement of ground water legislation to impose control on the excessive use of ground water³⁰. The Ground Water Division No. 2, Rajkot under Gujarat Water Resources Development Corporation Limited (GWRDC) in its report³¹ also recommended a ground water development plan under which the user industry would pay for the development of the ground water in proportion of their use so as to generate funds for necessary ground water recharge in the area. In the Performance Audit printed in Audit Report No. 2 (Civil) for the year ended 31 March 2010 also the same was pointed out wherein it was recommended by Audit that the legislation should be enacted. However, it was observed that the same has not been enacted (March 2017). There was also no plan in place to control and regulate the withdrawal of ground water.

The Department (October 2017) stated that under directions of the Hon'ble Supreme Court the regulation and control of the ground water is being done by Central Ground Water Authority (CGWA). The Gujarat Ground Water Authority (GGWA) is acting as a recommendatory body and permissions are granted by CGWA. The draft bill for enforcement of ground water legislation is under process of finalization.

The reply is not convincing as the Ministry of Water Resources, GoI had circulated model bill in 2005 to enable the States to enact ground water legislation. Such an Act was enacted and implemented by many states such as Goa, Tamil Nadu, Kerala, West Bengal, Himachal Pradesh and Union Territories of Lakshadweep and Puducherry but it was not enacted and implemented by Gujarat (March 2017).

Thus the fact remains that no management techniques recommended by the HLCs have been implemented even after a lapse of 25 to 39 years of its acceptance by the GoG.

Salinity Control Techniques

The HLCs observed that due to flat slopes of the river bed near the mouth of the rivers, tidal waves were entering through the estuaries upto six to seven kilometres inland. Therefore, stopping of the tidal ingress by sealing the mouth of the rivers by constructing Tidal Regulators (TRs)/ *Bandharas* near the mouth of the rivers was recommended by the HLCs. As shown in **Table 3**, against 180 TRs/ *Bandharas* recommended by the HLCs, 100 TRs/ *Bandharas* have been constructed in the four reaches. The progress was significant in

³⁰ To ensure that the total withdrawal was not more than the annual recharge.

³¹ Report on Salinity Ingress and Ground Water Monitoring in coastal area between Okha-Maliya (2011).

Una-Madhavpur and Maliya-Lakhpat but very low in Bhavnagar-Una and Madhavpur-Maliya reaches.



Photograph of Medha creek TR at Porbandar

Instances of infructuous expenditure noticed during test check in Audit on incomplete works due to non-acquisition of land, unfruitful expenditure on damaged works and construction of *Bandharas* away from the mouth of the rivers are discussed below:

3.2.6.4 Infructuous expenditure on incomplete TRs/ Bandharas

In three divisions³², in respect of three works of TRs/ *Bandharas* it was noticed that the works were awarded between February 2007 and March 2012 without acquisition of the required land resulting in the works remaining incomplete till March 2017. Thus, the expenditure of ₹ 11.10 crore on these works was rendered unfruitful. In all these cases the GoG had specifically directed that required land should have been acquired before award of works. The divisions had gone ahead with the award of works without ensuring compliance with this condition resulting in the incomplete works as discussed below:

- Executive Engineer (EE), Salinity Control Division (SCD), Rajkot awarded (January 2010) the work of constructing Bodki TR (length 4,320 metre) in Maliya taluka of Rajkot district at a tendered cost of ₹ 7.96 crore with scheduled completion by July 2011. However, due to non-acquisition of land because of stiff opposition from the farmers (January 2012), the work could not be executed in Chainage (Ch) 2,090 metres to 4,320 metres of the right bank earthen dam. Therefore, the construction of TR could not be completed. The division paid (March 2013) ₹ 3.82 crore to the contractor and relieved him from the remaining work in June 2013. On the request of the land owners, till the

³² (i) SCD, Rajkot, (ii) SCD, Jamnagar and (iii) KID, Bhuj.

land was acquired, a gap of 50 metres on the right side of the spillway and 30 metres on the left side of the spillway was kept open for the passage of rain water into the sea and prevent the submergence of the land upstream. However, these gaps defeated the purpose of the TR in checking the tidal ingress. In respect of this work the GoG while giving the administrative approval had clearly stated that the work should not be awarded before acquiring the required land. Nevertheless, the contracts were awarded without acquiring the land resulting in unfruitful expenditure of ₹ 3.82 crore.

- EE, SCD, Jamnagar awarded (March 2012) the work of Pindara *Bandhara* (across river Nakajar) in Kalyanpur taluka of Jamnagar district at a tendered cost ₹ 3.13 crore with stipulated completion by February 2013. The work included construction of earthen dam from Ch (-) 110 metres to 90 metres, spillway from Ch 90 metres to 180 metres and earthen dam from Ch 180 metres to 1,070 metres. As the required land could not be acquired due to objections raised by the farmers, the agency was paid (March 2014) ₹ 3.03 crore and relieved from the work.

During site visit it was noticed (February 2017) that the earthen dam on the left hand side of the *Bandhara* was not constructed and the spillway was constructed only upto bucket level. Though the draft tender papers were approved by GoG with the specific condition that necessary consent or *kabja* of private land should be obtained before approving the tender, the division went ahead with the award of contract without ensuring compliance with this requirement resulting in the intended benefits of the work not being achieved even after incurring an expenditure of ₹ 3.03 crore.

- The work of Vira *Bandhara*, in Anjar taluka of Kachchh district was awarded (February 2007) by KICD, Bhuj at a tendered cost of ₹ 5.53 crore with scheduled completion by August 2008. However, as the work could not be completed due to non-acquisition of land, the agency was relieved in May 2012 after incurring expenditure of ₹ 4.25 crore. In the Performance Audit printed in Audit Report No. 2 (Civil) for the year ended 31 March 2010 it was pointed out in **Paragraph No. 1.1.9.6** that due to non-acquisition of private land, the work of the left bank earthen bund and the weir³³ could not be completed rendering the expenditure of ₹ 4.25 crore infructuous. During site visit it was also observed (March 2017) that the work of left bank earthen bund and the weir were still incomplete even as on date.

In reply the Department stated (October 2017) that Government waste land was more than 50 per cent of the required land. Since the same was in possession of the department and the private land owners had given their consent for the acquisition, the work order was issued as per PWD Manual. In respect of Bodki TR, tenders for remaining works were already approved and in respect of Pindara *Bandhara* and Vira *Bandhara* the process of land

³³ The escape provided for the passage of surplus water from a reservoir.

acquisition could not be started as new Land Acquisition Act, 2013 had come into force and guidelines for the same were not available (April 2017).

The replies are not convincing as the works were awarded against the explicit condition of GoG for acquisition of the required land before award of works. This resulted in unfruitful expenditure of ₹ 11.10 crore and non-achievement of intended objective of preventing sea water ingress.

Further, even in Audit Report No. 2 (Civil) for the year 2009-10 it was recommended that land acquisition should be completed before taking up the works for its smooth and effective implementation. However, the above instances reveal that the Audit's recommendation have not been acted upon by the Department.

3.2.6.5 Construction of TRs/ Bandharas away from the mouth of the rivers beyond Tidal reach

The HLCs suggested stopping of tidal ingress into the land by constructing TRs/ *Bandharas* near the mouth of the rivers to seal them. It was noticed that TRs/ *Bandharas* mentioned in **Appendix X** were constructed beyond the tidal reach of the sea water. Hence, the sea water would still intrude and the *Bandharas* would not serve the purpose of prevention of sea water ingress. These would only act as a check dam for creation of sweet water reservoir. The construction of these TRs/ *Bandharas* near the mouth of the rivers would have prevented the sea water ingress and also brought more land into use.

In reply the Department stated (October 2017) that suggestion of the HLCs to construct TRs/ *Bandharas* on mouth of the creek is a general guideline. The mouth of creek is made of sand dunes with loose banks and poor geological sub-surface strata which is not technically suitable locations for construction of TRs/ *Bandharas*. Hence, TRs/ *Bandharas* are constructed at technically and economically suitable sites.

Reply is not convincing as the TRs/ *Bandharas* are salinity control structures meant for stopping of tidal ingress into the land by sealing the mouth of the rivers as shown in Photograph of Medha creek. The construction of these TRs/ *Bandharas* away from the mouth of rivers and beyond the tidal reach defeated the purpose of prevention of tidal ingress into the lands. The Department did not furnish the investigation reports showing non-feasibility of construction of the structures on the mouth of the rivers.

Recharge Techniques

The HLCs recommended some artificial recharge techniques through construction of check dams, recharge tanks, recharge wells, recharge reservoirs, radial canal, spreading channel, afforestation and gully plugging to accelerate the induced infiltration in the affected areas. As shown in **Table 3**, except in case of check dams and recharge wells the progress of other activities under recharge techniques was very slow. The progress in these activities was significant in Una-Madhavpur and Maliya-Lakhpat reaches but very low in Bhavnagar-Una and Madhavpur-Maliya reaches.

Audit observations on the implementation of radial canal and spreading channel works are discussed below:

3.2.6.6 *Idling facility created in construction of Bodki radial canal*

The EE SCD, Rajkot planned construction of 2,940 metres long radial canal starting from Bodki TR in Maliya taluka of Rajkot District in anticipation of completion of Bodki TR and awarded the work in March 2013. The work was completed in February 2014 at a cost of ₹ 74.32 lakh. However, as discussed in **Paragraph 3.2.6.4** the work of Bodki TR was incomplete due to non-acquisition of requisite land. Thus, the construction of radial canal remained unfruitful due to non-availability of sweet water resulting in idling of facility worth ₹ 74.32 lakh (March 2017).

The Department stated (October 2017) that tender for the remaining work of Bodki TR is approved and the work would be started after 2017 monsoon.

3.2.6.7 *Non-completion of Pikhor radial canal*

The work of construction of four³⁴ radial canals upstream of Noli Reservoir in Mangrol taluka of Junagadh district was awarded (November 2011) by SCD, Porbandar at a tendered cost of ₹ 81.71 lakh with scheduled completion by October 2012. The work was shown as completed in August 2012 and final bill of ₹ 74.37 lakh paid.

We observed (February 2017) that against the total length of 2,015 metres to be excavated, the excavation was carried out only upto 1,830 metres. The canal was not excavated from 1,830 metres to 2,015 metres. Even in this stretch of 1,830 metres there was an unexcavated stretch of 30 metres between Ch. 240 metres and 270 metres due to water supply pipeline crossing the canal. This created hindrances in the flow of water in the initial stretch of the canal. The agency was relieved (August 2012) without completion of the work after payment of ₹ 74.37 lakh and without following the relieving procedures *viz.*, approval of excess/ saving in the work and approval of the Competent Authority to relieve the agency before making the final payment.

The Department (October 2017) accepted the partial blockage of canal between Ch. 240 metres and 270 metres and stated that the issue will be resolved soon with the concerned Gram Panchayat and Gujarat Water Supply and Sewerage Board. It was also stated that the work beyond Ch. 1,830 metres was aborted due to local opposition.

Thus the work was awarded without complete acquisition of land and the blockage of radial canal in the initial chainage hindered the flow of water. Therefore, intended benefits remained only partially achieved despite the expenditure of ₹ 74.37 lakh

³⁴ Pikhor (2.015 km), Shakrana (2.10 km), Limbora (0.84 km) and Mankhetra (0.72 km).

3.2.6.8 Incomplete stretches in work shown as completed

The construction of 6.60 km long spreading channel for joining river Netravati and Madhuvanti river Phase-I, in Mangrol taluka of Junagadh district was awarded in June 2009 by SCD, Porbandar. The work was shown as completed in March 2016 after incurring an expenditure of ₹ 2.54 crore.

We observed during site visit (February 2017) that the spreading channel was not excavated at Ch. 1,560 metres and Ch. 4,040 metres. It was also informed by the officials that the channel was not excavated at six other locations where cross drainage (CD) works were proposed. The proposal for getting administrative approval for construction of these eight CD works across the spreading channel was submitted by SCD, Porbandar (February 2017). Out of these, the work of four CDs is accepted and is in progress (October 2017).

Thus, due to missing links the envisaged benefits of the project could not be fully reaped even after lapse of nearly eight years since the award of the work and incurring expenditure of ₹ 2.54 crore.

The Department stated (October 2017) that the CD works will be completed in due course and water will flow in the entire length of the canal soon.

3.2.6.9 Non-completion of spreading channel due to non-acquisition of land

In the following cases as shown in **Table 6**, the concerned divisions proposed the work of spreading channel to divert the surplus water of the connected recharge reservoirs in the channel. The spreading channels were to be aligned parallel to the sea coast to serve as a good recharge cum salinity control device by creating a sweet water barrier and also facilitate irrigation facilities. The GoG had specifically directed that required land should have been acquired before award of works. However, the division had gone ahead with the award of works without ensuring compliance with this condition resulting in the incomplete works of spreading channel as discussed in **Table 6** below:

Table 6: Incomplete works of spreading channels as on March 2017 due to non-acquisition of land

Sl. No.	Name of work	Length of the channel	Cost incurred (₹ in crore)	Missing link (Status as on 31 March 2017)	Remarks
		Month of first work order			
1	Ozat-Madhuvanti spreading channel	24,430 m October 2006	11.81	Ch. 6,120 m to Ch. 6,360 m was held up due to non-acquisition of private land; three minor bridges at Ch. 6,270 m, Ch. 7,710 m and Ch. 12,360 m were yet to be constructed.	The Department stated (October 2017) that encroachment from Ch 6,120 m to 6,235 m (115 m) is removed and work order is issued in May 2017. Out of three bridges the work of two bridges at Ch. 7,710 m and 12,360 m are at DTP stage. Work in remaining length and one bridge at Ch. 6,270 m will be taken up after land acquisition completed.

Sl. No.	Name of work	Length of the channel	Cost incurred (₹ in crore)	Missing link (Status as on 31 March 2017)	Remarks
		Month of first work order			
2	Spreading channel (Radial Canal) from Medha creek TR	3,660 m July 2014	1.62	Work beyond Ch. 2,450 m was held up due to non-acquisition of land.	The Department stated (October 2017) that the work in remaining length will be completed after possession of land.
3	Spreading channel from Bhogat <i>Bandhara</i> to Medha creek TR	11,280 m February 2014	1.26	Ch. 1,290 m to Ch. 1,740 m due to non-acquisition of land.	The Department stated (October 2017) that the agency was paid for the work done and relieved from the work in November 2015.
4	Construction of spreading channel joining Hadiyana <i>Bandhara</i> to Und river	11,400 m February 2012	3.71	Ch. 7,950 m to Ch. 9,570 m (forest land) and Ch. 10,800 m to Ch. 11,400 m (private land) was held up due to non-acquisition of land.	The Department stated (October 2017) that land acquisition from Ch. 10,800 m to 11,400 m is now completed and work would be executed in due course.
5	Construction of spreading channel joining Khiri TR and Hadiyana <i>Bandhara</i>	6,900 m December 2008	6.85	Ch. 990 m to Ch. 1510 m (private land) was held up due to non-acquisition of land.	The agency was paid for the work done and relieved in April 2011. The Department stated (October 2017) that the work will be completed after possession of land is obtained.
6	Non-completion of spreading channel (radial canal) connecting Bed TR to Sarmat Khara Beraja	1,530 m (Ch. 1,020 m to Ch. 2,550 m) December 2007	0.52	Ch. 1,170 m held up due to passing of water supply pipe line.	The agency was paid for the work done and relieved in August 2012. The Department stated (October 2017) that the work will be completed in due course.
	Total		25.77		

Audit observed that the work was mainly held up due to non-acquisition of land. With the new Land Acquisition Act, 2013 coming into force for which the Rules were yet to be framed (March 2017), the land could not be acquired. Since the work could not be proceeded with, wherever the agency/ contractor requested, it was relieved from the work after paying for the quantum of the work done by them.

Thus, due to awarding the work by the Department without acquisition of requisite land, envisaged benefits of the project could not be fully reaped even after incurring expenditure of ₹ 25.77 crore as the water could not flow through the entire chainage and sweet water barrier could not be created.

In reply the Department stated (October 2017) that the oral consent of affected farmers was obtained and more than 50 per cent of total land (Government and private) was available, hence the work order was issued as per provisions of PWD Manual.

The reply is not convincing as despite the explicit instructions of the Government the work was awarded without complete acquisition of private land. As a result, the envisaged works could not be completed.

Further, even in Audit Report No. 2 (Civil) for the year ended 31 March 2010 it was recommended that land acquisition should be completed before taking up the works for its smooth and effective implementation. However, the above instances reveal that the Audit's recommendation have not been acted upon by the Department.

3.2.6.10 Slow progress in Afforestation work

The HLCs stated that vegetation improves the rate of infiltration of water and thereby improves the recharge rate of water. It, therefore, recommended for creation of shelter belt of suitable trees and afforestation of waste lands, *gauchar* lands and village commons. However, as against afforestation of 1,10,700 ha³⁵ of land recommended by HLCs, the afforestation was carried out only in 5,867 ha³⁶ (5.30 per cent) upto March 2017.

The Department stated (October 2017) that afforestation work was initially carried out through the Forests and Environment Department as deposit works. The Forests and Environment Department did not furnish the details of the work done and expenditure incurred against the grant released despite repeated requests. Therefore, the Department did not release further grant for afforestation and in lieu thereof other recommendations of HLCs were stressed upon.

Reply is not convincing as the issue between two Departments could be sorted out through mutual co-ordination so that the recommendations of the HLCs are implemented.

3.2.6.11 Non-plugging of Gully/ Nalla

The HLC-II emphasised different measures to harvest all available run-off water at different locations to induce ground water recharge. Thus, a series of *nalla plugs* would help in arresting the surface run-off and impounding it at intervals in *nalla* ponds. This would accelerate infiltration rate and consequently the recharge efficiency of the ground water resources.

As mentioned in **Table 3**, against the total 85,400 *nalla* plugs recommended in three reaches *viz.*, Bhavnagar-Una (20,000), Madhavpur-Maliya (45,400) and Maliya-Lakhpat reach (20,000), no such activity has been carried out in any of these reaches (March 2017).

The Department stated (October 2017), that the work was initially carried out as deposit work by Gujarat State Land Development Corporation (GSLDC). It was further stated that as GSLDC did not furnish the details of the work done and expenditure incurred against the grant released for deposit works despite

³⁵ The figure of afforestation here does not tally with that in **Table-3** because this includes afforestation, raising of shelter belts, improvement and afforestation of mangrove forest.

³⁶ The work is carried out only in Una- Madhavpur reach. No work is carried out in any other reach.

repeated requests, no further grant was released and other recommendations of HLCs were stressed upon.

Reply is not convincing as the issue between the Department and the Government company could be sorted out so that the recommendations of the HLCs are implemented.

3.2.6.12 Coastal Land Reclamation

The HLC-II recommended utilization of sweet water from certain reservoirs for reclaiming the coastal saline land for agricultural development by leaching through available sweet water with suitable drainage system. The Committee suggested that the sweet water of the medium irrigation schemes and recharge schemes could be utilized for leaching and reclamation of these areas. However, as the problem was acute, it suggested utilisation of Narmada water on a priority basis. Though HLC identified total of 39,500 ha of coastal land to be reclaimed in Bhavnagar-Una, Madhavpur-Maliya and Maliya- Lakhpat reach, no coastal land reclamation activity was carried out in any of these reaches (March 2017).

The Department stated (October 2017) that efforts were made in four cases³⁷ to renovate the existing bunds (3,880 ha). It was also stated that in case of Goinj 2 reclamation bund of 468 ha (which was a new reclamation *bund*), the administrative approval had been accorded and detailed technical sanction was under preparation. The Department informed that the Government had included 10 salinity preventive schemes under “Sauni Yojana”, to be filled up with one million acre feet (MAF) surplus water of Narmada which would be diverted to nearby saline land. Hence it was already planned to use surplus water of Narmada for salinity prevention schemes.

The reply is not convincing as the works of four reclamation *bunds* were for renovation of the existing *bunds* and would result in reclamation of only 9.82 *per cent* of the land reclamation recommended by the HLCs. No new coastal *bund* had been constructed as recommended by the HLC. Moreover, the feasibility study to utilise one MAF surplus water of Narmada to Kachchh district was awarded in 2010 and even after passage of seven years this work is still at survey and investigation stage (March 2017).

3.2.7 Impact Assessment

The HLCs suggested frequent observations and monitoring of the improvement/ deterioration in water levels and ground water quality in the representative observation wells³⁸. The HLC-II had specifically recommended annual monitoring of ground water. The Department had also stated that the annual status report based on the ground water monitoring was quite necessary

³⁷ Renovation of Jodia- Manomora reclamation bund (2,745 ha), Renovation of Khijadiya- Dhunvav reclamation bund (800 ha), Renovation of Sarmat- Khara Beraja reclamation bund (70 ha), Renovation of Salaya- Goinj reclamation bund (265 ha).

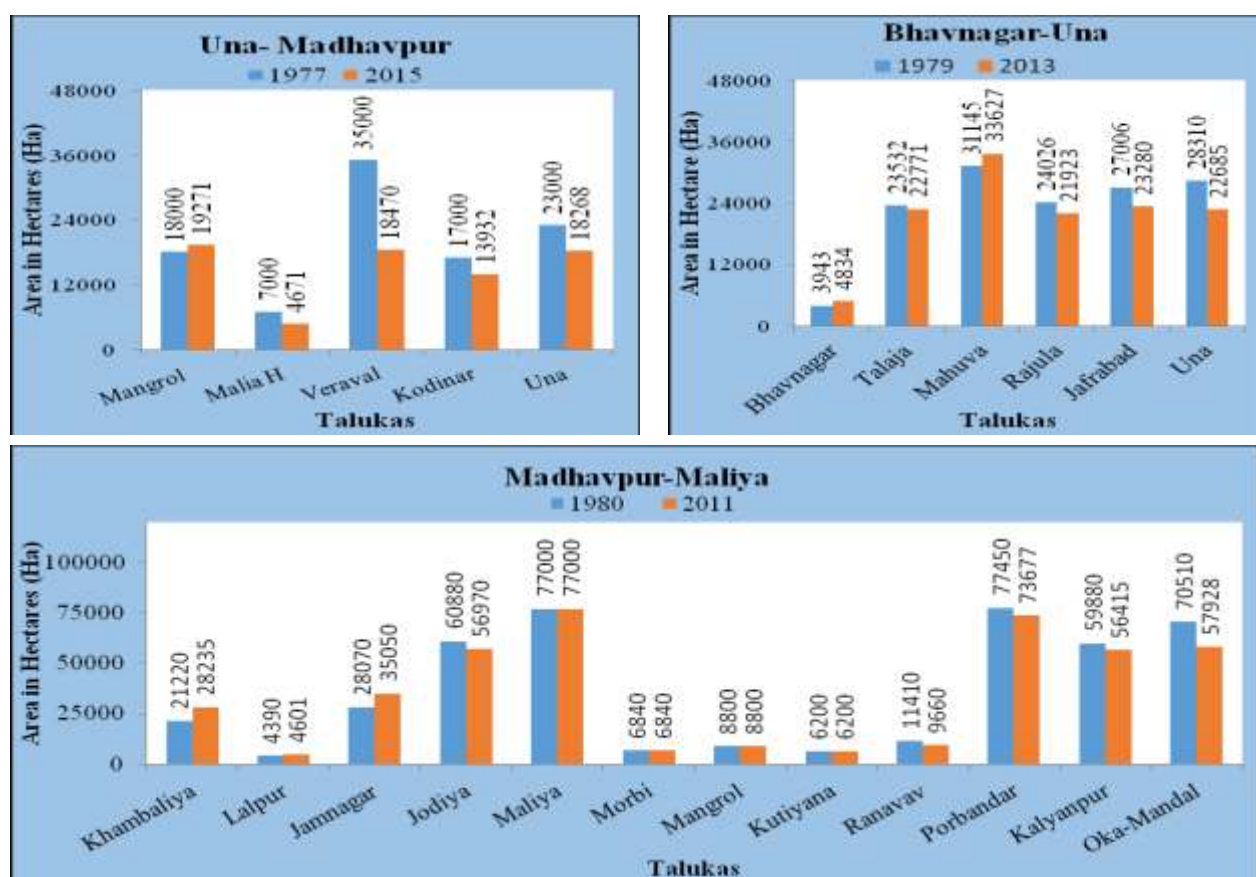
³⁸ The study area is monitored for ground water quality changes through designated active observation wells located along the geophysical profiles fixed since 1980. Number of wells have been increased as per requirement over the years.

to evaluate the efficacy of the work done. It was noticed that the evaluation reports on the basis of the analysis of the water samples in the observation wells were prepared for the Una-Madhavpur reach upto May 2015, Bhavnagar-Una reach upto 2011-12 and Madhavpur-Maliya upto 2011. No reports were prepared after these periods. For Maliya-Lakhpat reach, the SE, KIC, Bhuj stated (March 2017) that no evaluation reports were prepared. The shortage of technical staff was stated as the reason for non-preparation of the evaluation reports.

Based on the available evaluation reports and other data obtained from the Department, the status of salinity ingress and quality of ground water is discussed in succeeding paragraphs.

3.2.7.1 Change in area affected by salinity

The graphs below show the taluka wise change in the area affected by salinity ingress in Una-Madhavpur, Bhavnagar-Una and Madhavpur-Maliya reaches. The data has been compiled from evaluation reports prepared for the concerned reaches and the information furnished by the concerned divisions.

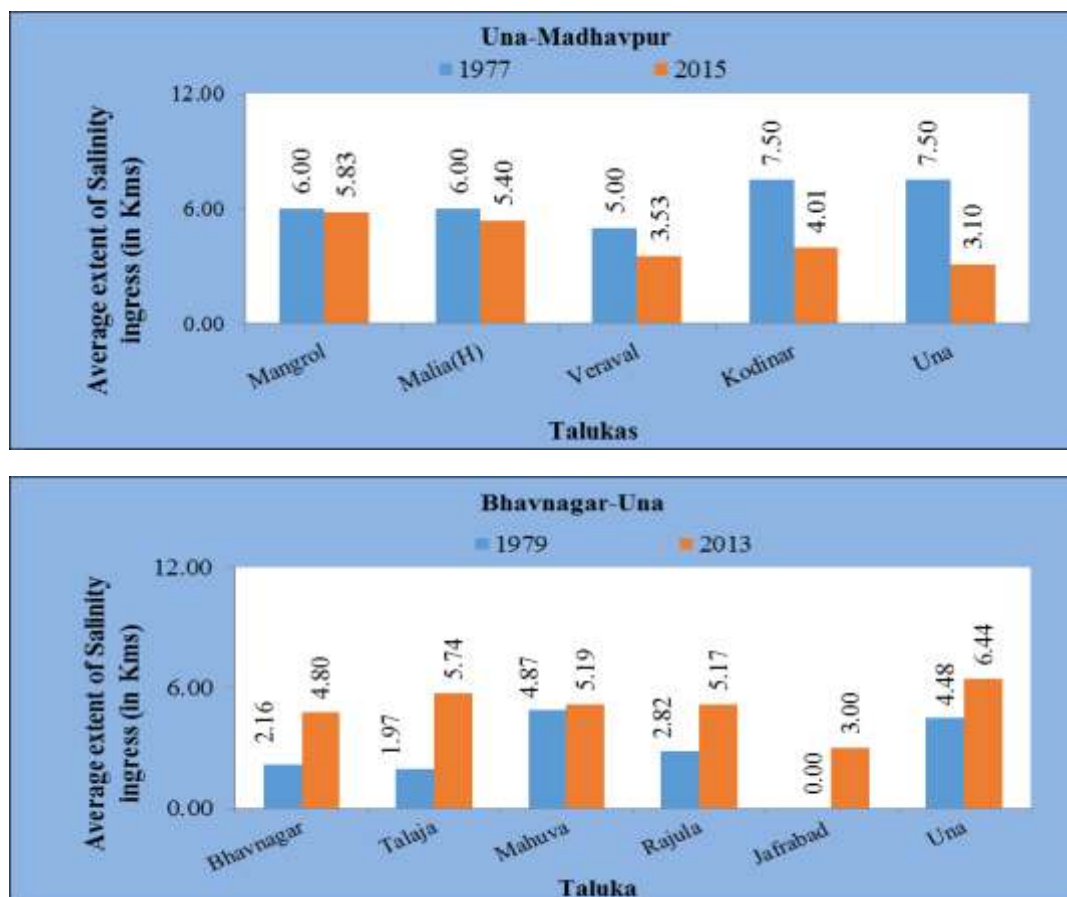


Graphs showing the changes in Area (in Hectare) affected by salinity ingress

It can be seen that in Una-Madhavpur reach, the area affected by salinity reduced in all talukas (except a marginal increase in Mangrol taluka). In Bhavnagar-Una, there was increase in salinity ingress area in Bhavnagar and Mahuva while it decreased in Talaja, Rajula, Jafrabad and Una talukas. In Madhavpur-Maliya reach in seven talukas there was either increase or no

change in area affected by salinity ingress viz., Khambaliya, Lalpur, Jamnagar, Maliya, Morbi, Mangrol and Kutiyana while in other five talukas it reduced.

The graphs below show the taluka wise change in the average extent of salinity ingress from the sea coast in Una-Madhavpur and Bhavnagar-Una reaches. It can be seen that in Bhavnagar-Una the extent of salinity ingress increased in all the talukas; whereas it decreased in all the talukas of Una-Madhavpur. The data for Madhavpur-Maliya and Maliya-Lakhpat reaches was neither made available nor was the information available in the evaluation reports.



Graphs showing changes in average extent of salinity ingress (in kilometres)

It can be seen from the above that in Una-Madhavpur reach, where the progress of SIPS works was good, area affected by salinity as well as the extent of salinity ingress has reduced (except a marginal increase in Mangrol taluka). On other hand, in Madhavpur-Maliya reach, where the progress of works recommended by HLC was slow, area affected by salinity has increased or remained almost static in most of the talukas.

The Department stated (October 2017) that Mangrol taluka does not show remarkable change as the area is highly cavernous so the ground water movement is very high. There are limited sources of recharging of ground water and the demand of water for agriculture has also restricted the improvement. The Morbi and Maliya talukas which possess saline soil in their coastal area have also not shown any improvement. In Khambaliya, Lalpur

and Jamnagar due to issue of land acquisition of the reserve forest area falling in the submergence of the proposed salinity control schemes and development of industries in the area, the improvement has been restricted. However, the area affected by salinity which was increasing at the average rate of 0.5 kms *per* year has been checked in Saurashtra and Kachchh due to the salinity control and recharge works undertaken.

The reply of the Department that the rate of increase in salinity ingress at 0.5 kms *per* year has been checked is not convincing because though the overall figures of the reaches show a reduction in area under salinity ingress, out of 23 talukas the improvement has been only in 13 talukas. Five talukas have shown increase in area under salinity ingress while the remaining five have shown no improvement. Further, the average extent of salinity ingress has substantially increased in all the talukas of Bhavnagar-Una reach.

3.2.7.2 Ground water quality and ground water balance

The HLCs emphasised constant monitoring of the ground water conditions and water quality to assess the extent and degree of salinity in ground water. HLCs opined that repeated observations of the representative observation wells would indicate the improvement/ deterioration both in ground water levels and ground water quality. Though recommended by the HLCs, there was no Review and Monitoring Committee to monitor and review the progress in implementation of SIPS and its impact on ground water quality and ground water balance. There are 1,180 observation wells³⁹ identified in the four reaches which are monitored for ground water levels and quality of ground water. The water samples of these wells are analysed on different parameters such as Total Dissolved Salts (TDS), chloride to carbonate plus bi-carbonate ratio, pH, electrical conductivity *etc.* On the basis of information on analysis of the water samples in these observation wells⁴⁰ as available on record, the emerging position of ground water quality, ground water levels in terms of TDS and chloride to carbonate plus bi-carbonate ratio and ground water balance are discussed below:

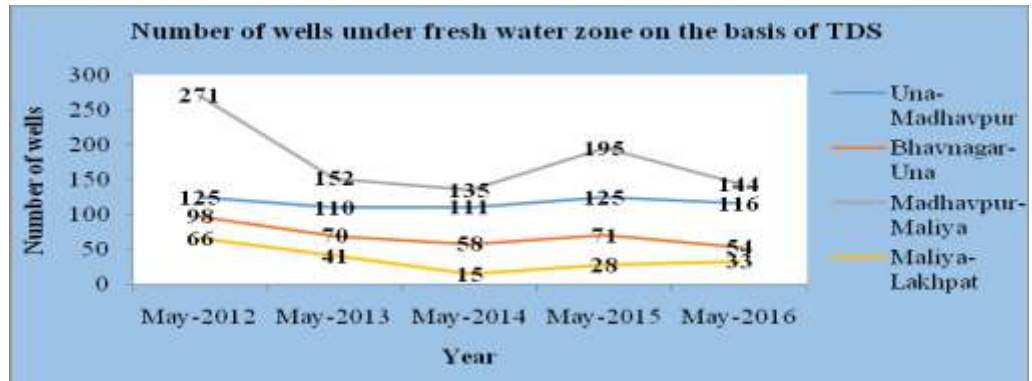
(a) Ground water quality

The ground water quality in the salinity affected area are chemically analysed mainly on the basis of Total Dissolved Solids (TDS) and the ratio of chloride to carbonate plus bi-carbonate content in water.

The TDS contour of 2,000 ppm (parts per million) demarcates the zone of saline water and water suitable for irrigation. Based on the data made available for TDS, the numbers of wells falling in different salinity zones are shown in **Appendix XI**. The trend analysis between May 2012 and May 2016 on the number of wells falling under fresh water zone is shown in the graph below:

³⁹ 294 observation wells in HLC-I and 886 observation wells in HLC-II reach.

⁴⁰ The observations discussed in the subsequent paragraphs are based on the information in respect of different parameters studied in each observation well. However, as all the parameters of each well were not available on record, the total numbers of wells differ while analysing the different parameters.



Graph showing number of wells under fresh water zone on the basis of TDS

The above graph shows that as compared to May 2012, in all the four reaches the numbers of wells under fresh water category have reduced. Further, as compared to May 2015 also, the number of wells under this category reduced in three reaches except in Maliya-Lakhpat reach where the increase was marginal.

Another parameter to measure the ground water quality is chloride to carbonate plus bi-carbonate ratio which determines the degree of contamination of the ground water by sea water. Based on the data made available, the numbers of wells falling under different category of ratio are detailed in **Table 7** below:

Table 7: Details of chloride to carbonate plus bi-carbonate ratio in wells

Sl. No.	Water quality	Range of ratio values	No. of Wells									
			Una-Madhavpur		Bhavnagar-Una		Madhavpur-Maliya		Maliya-Lakhpat		Total	
			May 2012	October-2016	May-2012	May-2016	May-2012	May-2016	May-2012	May-2016	May-2012	October 2016/ May 2016
1	Non-contaminated (Fresh water)	< 1	31	45	39	13	57	41	20	24	147	123
2	Slightly contaminated	01-02	55	35	46	23	64	57	30	22	195	137
3	Moderately contaminated	02-06	52	67	47	46	126	139	54	36	279	288
4	Injuriously contaminated	06-15	39	42	16	29	61	123	26	7	142	201
5	Highly contaminated	15-25	23	21	8	5	15	22	3	4	49	52
6	Very highly contaminated to sea water	>25	55	51	1	6	4	8	0	1	60	66
Total			255	261	157	122	327	390	133	94	872	867

(Source: Information furnished by the Department)

Further, from **Table 7** it is noticed that in May 2012, out of 872 wells only 147 wells (16.86 per cent) fell under fresh water category which in May 2016/ October 2016 reduced to 123 wells out of 867 wells (14.19 per cent). The number of wells falling within moderately contaminated to very highly contaminated to sea water also increased during this period.

The above trend analysis shows that there was deterioration in ground water quality in these reaches as the number of fresh water wells reduced.

Ground water quality has improved in Una-Madhavpur where the progress of works against HLC recommendation has been good. However, in Madhavpur-Maliya where the progress of works against HLC recommendation has been slow, there has been deterioration in ground water quality.

The Department stated (October 2017) that TDS is influenced by the rate of precipitation of rain water and withdrawal of ground water in the area. When the area receives less rainfall, the recharge rate of fresh water decreases which effects the number of wells showing higher TDS values. The chloride to carbonate plus bi-carbonate ratio shows the ingress of saline sea water and contamination of ground water by sea water intrusion. When the prolonged storage of fresh water in the structure will be achieved the resultant fresh ground water quantity will increase and the contamination of the ground water will be reduced. Due to Deccan trap forming the coast line, phenomenon of sea water ingress directly into aquifer is observed in Khambaliya, Lalpur and Jamnagar taluka.

(b) Ground water levels

As mentioned in **Paragraph 3.2.6.3**, the HLCs recommended enforcement of ground water legislation to impose control on the excessive use of ground water. The water level in the wells, if below the sea level, may cause a reverse hydraulic gradient towards the land. Under these circumstances the sea water could travel into the land and convert the sweet water of the wells into saline water.

It was observed on the basis of available data that in May 2012, in 291 out of 989 wells (29.42 *per cent*) the ground water level was below the sea level. In May 2016/ October 2016, in 200 out of 782 wells (25.57 *per cent*) the ground water level was below the sea level. Thus there was marginal improvement in ground water levels in these well during the period. However, due to significant number of wells with water level below the sea level there remains the possibility of sea water intrusion on account of reverse hydraulic gradient. Thus, there is an imperative need for enforcement of ground water legislation to prevent the creation of reverse hydraulic gradient towards the land thereby avoiding the sweet water wells turning saline.

The Department stated (October 2017) that sea water intrusion is governed by the ground water table and also by the subsurface geological conditions of the area. In Mandvi taluka of Kachchh, in the well which recorded 97.02 m water level below sea level, the TDS value of water was 2,960 ppm indicating that reverse hydraulic gradient of sea water had not developed in the area.

The Department has also accepted the fact that ground water table effects sea water intrusion. Audit is of the view that non-salinity of one well does not prove the fact that reverse hydraulic gradient of sea water has not affected the area. It would depend on the location of the well, topography of the area and location of other observation wells.

(c) Ground water balance

The ground water balance in respect of Una-Madhavpur reach was compiled in Audit based on information furnished by divisions and information available in evaluation reports as shown in **Table 8** below:

Table 8: Details of ground water balance in talukas of Una-Madhavpur reach

Name of taluka	No. of pump wells			Effective recharge by rainfall and structures ⁴¹ (in MCM ⁴²)			Effective draft ⁴³ (in MCM)			Ground water balance <i>i.e.</i> , net withdrawal (Effective recharge - effective draft) (in MCM)		
	2012-13	2013-14	2014-15	2012-13	2013-14	2014-15	2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
Mangrol	5070	5146	5775	12.19	16.68	19.89	28.39	28.82	32.34	-16.20	-12.14	-12.45
Maliya (H)	1976	2006	2202	6.58	14.33	12.47	11.07	11.23	12.33	-4.49	3.10	0.14
Veraval	6679	6779	7993	9.34	32.12	27.29	51.43	52.20	61.55	-42.09	-20.08	-34.26
Kodinar	3163	3210	2010	5.81	18.90	22.01	26.57	26.97	16.88	-20.76	-8.07	5.13
Una	3366	3416	1535	7.81	26.50	21.27	21.20	21.52	9.67	-13.39	4.98	11.60
Total	20254	20557	19515	41.73	108.53	102.93	138.66	140.74	132.77	-96.93	-32.21	-29.84

(Source: Information furnished by the Department)

It can be seen from **Table 8** that in Mangrol, Maliya (H) and Veraval talukas there was increase in number of pump wells from 2012-13 and consequently the effective draft of ground water also increased leading to negative/negligible ground water balance in the area. In Una and Kodinar talukas the pump wells decreased and consequently the effective draft also reduced leading to positive ground water balance. This indicates that ground water legislation is very much essential which has not been enacted (March 2017).

The Department (October 2017) stated that the regulation and control of the ground water is being done by Central Ground Water Authority (CGWA). The Gujarat Ground Water Authority (GGWA) is acting as a recommendatory body and permissions are granted by CGWA. A draft bill is prepared by CGWA and forwarded to all State Government for necessary comment. The Gujarat Water Resource Development Corporation has passed on its comment in July 2016. The draft bill is under process of finalization and after necessary approval from Competent Authority it will be enacted.

The reply is not convincing as the Ministry of Water Resources, GoI had earlier circulated a model bill in 2005 to enable the States to enact ground water legislation which has not been implemented by Gujarat (March 2017).

3.2.8 Conclusion and Recommendations

The HLC reports accepted during the period 1978 to 1992 have not been implemented fully even after a lapse of 25 to 39 years despite the recommendation to implement the same between seven to 10 years. There was no holistic planning in terms of the time frame required to complete

⁴¹ The figure shows the recharge by structures created under SIPS only and not the recharge by other structures constructed by Panchayat and other agencies.

⁴² Million cubic metre.

⁴³ Withdrawal of ground water- It is considered @ 70 per cent of the draft which is the amount of water lifted from the aquifer by means of various lifting devices.

the scheme as a whole, fund requirements for the entire scheme implementation based on detailed investigation and requirement of land for completion of the scheme. The individual recommendations of HLCs were planned and implemented on piece-meal basis by the individual implementing divisions. The implementation has been above 50 per cent only in respect of check dams, tidal regulators/ *bandharas* and recharge wells. In respect of afforestation, coastal land reclamation, TCD farms and gully and *nalla* plugging the implementation has been negligible. Out of the four reaches where the works were implemented, the progress was significant in Una-Madhavpur and Maliya-Lakhpat and negligible in Bhavnagar-Una and Madhavpur-Maliya reaches. The cost of SIPS has already increased from ₹ 789.12 crore to ₹ 3,590.44 crore (March 2017). Even in the activities that have been implemented, all the envisaged chainages have not been covered mainly due to non-acquisition of land leading to cases of incomplete works, unfruitful expenditure and idling of facility. As a result, there has not been a marked improvement in areas affected by salinity ingress.

The Government may;

- *get the remaining works completed in a time bound manner to prevent salinity ingress.*
- *constitute a High Level Review and Monitoring Committee to monitor and periodically review the progress in implementation of SIPS.*
- *enact ground water legislation in order to control unregulated drawl of ground water.*

3.3 Avoidable expenditure on delayed payment of electricity bills

Delayed payment of electricity bills in respect of pumping stations resulted in avoidable expenditure of ₹ 2.35 crore during the year 2013-14 to 2016-17.

Executive Engineer (EE), Drainage Division, Gandhinagar (the division), a division of Water Resources Department, Government of Gujarat, obtained 11 electricity connections between May 2004 and March 2015 from Uttar Gujarat Vij Company Limited (UGVCL) for operating 11 pumping stations of the Narmada Main Canal (NMC) based pipe line projects.

The tariff schedule of UGVCL stipulated that delayed payment charges would not be levied if the electricity bill was paid within 10 days from date of billing, but was leviable beyond 10 days at the rates provided by the Electricity Duty Act.

During scrutiny of electricity bills of the above connections for the period 2013-14 to 2016-17, it was observed (October 2016 and July 2017) that there were delays in payment of electricity bills resulting in levy of delayed payment charges. The division paid delayed payment charges of ₹ 0.09 crore

for three pumping stations during 2013-14, ₹ 0.34 crore for six pumping stations during 2014-15, ₹ 0.41 crore for 11 pumping stations during 2015-16 and ₹ 1.51 crore for 11 pumping stations during 2016-17 to UGVCL. Thus, the division paid ₹ 2.35 crore in the form of delayed payment charges to UGVCL during the last four years *i.e.*, 2013-14 to 2016-17.

Though grants demanded for the purpose (₹ 309.84 crore) were much higher than the grants received (₹ 203.11 crore) for the period 2013-14 to 2016-17, the actual electricity expenditure was more or less in tune with the grants received except for the year 2013-14 as given in **Table 9** below:

Table 9: Grants received and actual electricity expenditure

(₹ in crore)

Year	Grants received	Actual electricity expenditure
2013-14	22.48	34.45
2014-15	58.99	62.23
2015-16	33.30	34.95
2016-17	88.34	84.24
Total	203.11	215.87

Though during 2013-14 the actual electricity expenditure was much higher than the grants received, the delayed payment charges paid was only ₹ 0.09 crore. However, it increased in subsequent years from ₹ 0.41 crore to ₹ 1.51 crore. There were also delays ranging from one month to four months in the release of grants by the department which could have been avoided through regular follow-up by the divisions.

The substantial increase in delayed payment charges during 2016-17 show that efforts need to be made by the divisions to ensure timely release of grants and timely payment of electricity bills.

The Superintending Engineer (SE), Sujlam Suflam Circle-1, Gandhinagar stated (May 2017) that the electricity bills of different pumping stations are delivered to the concerned divisions in about 10 to 15 days period after reading of consumption by UGVCL. After receipt of bills, scrutiny and payment procedure took about one week's period at the division level. It was further stated that delay also occurred due to delay in allotment of grant.

Reply is not convincing as the reasons quoted in the reply for delayed payments could be avoided with proper coordination for timely receipt of bills and expeditious completion of procedure for payment. Timely and sufficient release of grants for payment of dues like electricity bills can be controlled and coordinated at the department level so as to avoid payment of such charges.

Thus payment of electricity bills after due date attracted delayed payment charges as per provision of tariff schedule. This resulted in avoidable expenditure of ₹ 2.35 crore during the year 2013-14 to 2016-17.

The matter was reported to the Government in April 2017. Reminders were also issued in June 2017, August 2017 and October 2017. However, reply is awaited (December 2017).

3.4 Avoidable expenditure on obtaining power connections

Obtaining power connections for two pumping stations prior to completion of the pipeline works resulted in avoidable expenditure of ₹ 1.54 crore on account of payment of electricity charges.

Government of Gujarat (GoG) accorded (April 2004) Administrative Approval for the execution of 14 Narmada Main Canal (NMC) based lift irrigation pipeline works. The project envisaged lifting of flood water in Narmada river from NMC and supplying it to various village ponds through pipeline and pumping stations. Under this project, GoG decided (October 2011) to take up Patan-Dindrol pipeline⁴⁴ works for supply of water to village ponds. For this, two pumping stations were to be constructed at Patan and Kalyana.

The Executive Engineer (EE), Drainage Division, Gandhinagar issued (September 2012) the work order to the contractor at tendered cost of ₹ 101.41 crore with stipulated completion in 18 months (by March 2014).

Audit observed (October 2016) that the pipeline was to be laid down in two sections *i.e.*, Patan-Kalyana and Kalyana-Dindrol. But the farmers/ land owners of Patan (under whose land pipeline were to be laid) requested (January 2013) the GoG either to pay higher price for their land or to change the pipeline route. On the basis of the request, GoG decided to change the route for Patan-Kalyana Section and approved (March 2013) the new route from Matpur to Kalyana. It also changed the location of Patan Pumping Station to Matpur. Owing to the change, the overall length of the pipeline increased by 1,691 meter⁴⁵ which was approved by the GoG in July 2013.

The contractor, owing to increase in scope of work, demanded extension for first time upto December 2014 in February 2014. Subsequent extensions were sought time and again. The pumping stations were finally tested in November 2015. The contractor completed all aspects of the work in October 2016.

In the meanwhile, the EE applied for High Tension (HT) connection of 2,500 Kilo Volt Ampere (KVA) and 2,300 KVA for Kalyana and Matpur pumping station in July 2013 and May 2014 respectively. While applying for the connection the EE stated the likely date of commencement of supply as 15 January 2014 for Kalyana pumping station and 15 November 2014 for Matpur pumping station.

⁴⁴ Khorsam to Mukteshwar was one of the 14 NMC based lift irrigation pipeline. The first phase from Khorsam to Patan had been executed and this work was the further extension of this pipeline.

⁴⁵ Initial overall length of the pipeline project was 30 km.

Audit observed that at Matpur pumping station, the order for release of power was issued by Uttar Gujarat Vij Company Limited (UGVCL) in January 2015 and billing started from March 2015. There was no consumption of electricity from March 2015 to October 2015. During this period, the division paid electricity charges of ₹ 0.41 crore to UGVCL on account of the contracted demand. Similarly, at Kalyana pumping station, the order for release of power was issued by UGVCL in February 2014 and billing commenced from April 2014. There was no consumption of electricity from April 2014 to October 2015. During this period, the division paid electricity charges of ₹ 1.13 crore to UGVCL on account of contracted demand.

Audit noticed that at the time of applying (July 2013/ May 2014) for the connections, the division was aware of the fact that GoG had approved the new route in March 2013 and there would be delays in completion of the work due to change of pipeline route. The contractor had been applying for extensions in time since the scope of work was increased. Under the circumstances there was no justification for getting the power connections for the pumping stations so much in advance of the work completion. Audit also noticed that as per the terms of the agreement with UGVCL, applying for the connection and signing of the agreement can be done in advance but the release order could have been obtained closer to the date of testing by applying for extension in time for release of power.

Therefore, a more systematic assessment by the division of the additional time required for the completion of the work and timely application to UGVCL for extension could have avoided payment of idle demand charges for a period of eight and 19 months for Matpur and Kalyana pumping stations respectively. This resulted in avoidable payment of ₹ 1.54 crore in the form of electricity charges.

The Government stated (September 2017) that the HT connections were obtained keeping in view the probable date of completion of works in all respect to avoid the delay in testing and commissioning of pumping stations. It was further stated that the work of pumping station at Matpur was delayed due to change in alignment of pipeline and accordingly change in location of pumping station due to opposition of farmers.

Reply of the Government is not convincing as the division was aware of the ground position at the time of applying for the connections and could have assessed the time required for work completion in view of known delays. With such assessment, the division could have applied for the extension to UGVCL in advance in terms of the conditions of the agreement.

Thus obtaining power connections for pumping stations prior to completion of the pipeline resulted in avoidable payment of electricity charges of ₹ 1.54 crore.

ROADS AND BUILDINGS DEPARTMENT

3.5 Unfruitful expenditure on construction of Railway Under Bridge

Delay in completion of work for approaches for the railway under bridge (RUB) on the missing link of Visavadar Dhari road has resulted in the RUB remaining unutilised after incurring an expenditure of ₹ 4.11 crore.

The Government of Gujarat (GoG) accorded (September 2007) Administrative Approval (AA) for construction of railway under bridge (RUB) on the missing link near Visavadar on the Visavadar Dhari road. The construction of RUB was to be done by the Railway Authorities as a deposit work whereas the work of the approaches was under the jurisdiction of the Executive Engineer (EE) of the Junagadh division of Roads and Buildings Department (R&BD). The estimates of ₹ three crore was approved by GoG in October 2011. The Railway completed (July 2014) the construction of RUB at a cost of ₹ 2.64 crore.

The Superintending Engineer (SE) Rajkot Circle of R&BD instructed (July 2014) the EE Junagadh division to prepare plans and estimates for the construction of the approaches as the work of RUB was nearing completion. Similar instructions were again issued in August 2014 and January 2015 as the RUB could not be utilised till the approaches were completed. The EE submitted (March 2015) the plans and estimates of ₹ 6.94 crore.

The EE also submitted (March 2015) the design proposals to the SE, Design Circle R&BD for providing opinion on the structural designs. The R&BD approved (August 2015) Draft Tender Papers (DTP) for the approach work for ₹ 8.13 crore. The tender for the work of approaches was awarded (December 2015) for ₹ 5.31 crore. The EE issued (January 2016) work order with stipulated completion by June 2016.

Subsequent to the issue of work order by EE in January 2016, the SE, Design Circle furnished the designs between March 2016 and June 2016 for the Dhari side approach only. The work was in progress as of December 2017 and an expenditure of ₹ 1.47 crore had been incurred. The contractor also intimated (June 2016) the EE that due to non-availability of the structural design of the Visavadar side, the work could not be completed and requested extension of time-limit upto December 2016. The Visavadar side drawings had still not been given to the contractor as the designs had not been finalised due to encroachments on the site (December 2017).

Thus the work of approaches for which actual construction period was just five months was pending even after 45 months from the completion of the RUB as on December 2017. This led to non-utilisation of RUB constructed in July 2014 at a cost of ₹ 4.11 crore⁴⁶.

⁴⁶ ₹ 2.64 crore (cost of RUB) plus ₹ 1.47 crore (expenditure incurred till July 2016 on approach work).

The Government stated (December 2017) that drawings and design for the Dhari side approach was submitted to R&B Design Circle for their opinion. During scrutiny, additional details were required to be collected for finalisation of design and this process took time. It was further stated that finalisation of Visavadar side drawings and design was still pending due to encroachment of about 400 meter length of alignment of approach road by Commercial buildings. The owners/ occupants of these commercial buildings were issued notices for vacating the place but there was no response. Considering the type of encroachment, an alternative for change of alignment is being studied which will require further time.

The reply is not convincing as the work is held up (December 2017) due to non-finalisation of structural designs of the Visavadar side because of encroachments. The structural design finalisation for Dhari side within the R&BD had taken a period of more than two years since 2015, which was avoidable. The study for alternative alignment will lead to further delays and non-utilisation of RUB for more time. Also, the matter of encroachments and the need to get these cleared was known even before the work was sanctioned and could have been addressed accordingly.

Thus, the delay in completion of approaches for the RUB has resulted in the RUB remaining unutilised after incurring an expenditure of ₹ 4.11 crore.

3.6 Excess payment of price variation of asphalt

Non adoption of star rate prevailing at the time of approval of Draft Tender Papers for payment of price variation for asphalt resulted in excess payment of price variation of ₹ 3.39 crore in two works.

As per Clause 59-A of the form B-2 of the model tender documents, for execution of works in the Roads and Buildings Department (R&BD), payment of price variation for asphalt used in the works, which was purchased by the contractor was to be adjusted for increase/ decrease in rates as compared to the star rate⁴⁷ prevailing on the date of approval of Draft Tender Papers (DTP).

In respect of two works awarded by R&BD, Bhuj, (Division) we observed (July 2016) that the star rates quoted in the tender and adopted for payment were not the applicable rates for the month in which the DTP was approved. The important details in relation to the above two works are given in **Table 10** below:

⁴⁷ Star rate is the rate of asphalt of the month in which draft tender papers are approved and is specified in the tender and used as a base rate for calculation of adjustment of price variation.

Table 10: Details of two works

Particulars	Widening of Bhuj Anjar road nine to 40 kms (M/s. MKC Infra Limited)	Widening and strengthening of pavement of Bachau-Ramvav-Rapar road (M/s. K. Sorthia)
Cost of work	₹ 43.17 crore	₹ 33.13 crore
DTP approval	May 2012	July 2012
Date of award	January 2013	December 2012
Scheduled month of completion	July 2014	March 2014
Actual month of completion	March 2015	September 2014
Star rate of asphalt in tender	VG 30 (60/70 grade) ₹ 37,243 per Metric Tonne (MT)	VG 30 (60/70 grade) ₹ 40,739.81 per MT
	VG 10 (80/100 grade) ₹ 36,282 per MT	
Price variation paid on asphalt	₹ 7.37 crore	₹ 4.58 crore

(Source of information: Documents obtained from the Division)

We observed (July 2016) that in the first work the rate of asphalt for VG 30 (60/70 grade) and VG 10 (80/100 grade) was ₹ 42,013 per MT and ₹ 41,052 per MT respectively during the month of May 2012 when the DTP was approved. However, the EE erroneously adopted the star rate prevailing in August 2011 (as shown in **Table 10**) while awarding the tender. The contractor consumed 1,824.886 MT and 3,487.558 MT of VG 30 (60/70 grade) and VG 10 (80/100 grade) respectively. Thus, the division paid an excess amount of ₹ 2.53 crore⁴⁸ as price variation on asphalt

In the second work, the Chief Engineer & Additional Secretary, R&BD, while approving the DTP mentioned (July 2012) the star rate of asphalt for VG 10 (80/100 grade)⁴⁹. However, the asphalt for VG 30 (60/70 grade) was used by the division whose star rate was ₹ 42,818.25 per MT during the month of July 2012. Thus, the star rate lower than the prevailing rate was adopted. The contractor consumed 4,120.515 MT asphalt of VG 30 (60/70 grade). Thus, the division paid excess price variation of ₹ 0.86 crore⁵⁰ to the contractor.

Therefore, adoption of an incorrect star rate while approving the DTP resulted in payment of excess price variation in asphalt of ₹ 3.39 crore.

The Government stated (September 2017) that fixation of star rate in DTP for payment of price variation was taken as per sanctioned estimate instead of on the date of approval of DTP and as such the tenders were received below the estimated cost. It was further stated that if the asphalt rate were taken higher in the DTP then the tenders would have been received on higher side.

The contention of the Government is not convincing as tender documents explicitly state that the star rate of asphalt should be as on the date of approval of DTP by Government. If the rate as adopted in the estimate had to be adopted the same would have been indicated in the tender itself. Tender rates

⁴⁸ 1,824.886 MT x ₹ 4,770 per MT plus 3,487.558 MT x ₹ 4,770 per MT.

⁴⁹ ₹ 40,739.81 per MT.

⁵⁰ 4,120.515 MT x ₹ 2,078.44 per MT.

being received below estimated cost is dependent on a variety of factors and cannot be fully attributed to or used to justify adoption of wrong star rates for asphalt in the tender.

Thus not adopting the star rate for asphalt as prevailing on the date of DTP approval as required by the model tender documents resulted in excess payment of price variation of ₹ 3.39 crore.

3.7 Avoidable expenditure on construction of Jilla Seva Sadan

Preparation of estimates without obtaining possession of land, structural design and analysing the SBC test report led to revision of estimates increasing the cost by way of extra expenditure of ₹ 2.36 crore.

Gujarat Public Works Manual (Manual) stipulates that works shall be commenced only after detailed designs of the structures are approved. Moreover, it also *inter-alia* provides that no work should be commenced on land which has not been duly made over by the responsible civil officer.

The Roads and Buildings Department (R&BD) accorded (December 2013) Administrative Approval (AA) and Technical Sanction (TS) for ₹ 20 crore and ₹ 20.94 crore respectively for the work of construction of Jilla Seva Sadan in newly created Aravalli District at Modasa. Though the land required for construction of the building was not in possession of the R&BD, Himmatnagar (the Division), the Executive Engineer (EE) prepared (December 2013) the estimates for the construction of the building on the basis of typical design⁵¹ for ₹ 20.35 crore to accommodate Collectorate and its related offices. The estimates were prepared for a building consisting of built-up area of 9,510 square meter (Sq m) with ground plus two Floors. The R&BD accepted (January 2014) the lowest tender at a cost of ₹ 15.95 crore. The EE issued (February 2014) work order with stipulated completion by November 2014.

Meanwhile, the Collector, Modasa allotted (January 2014) 12.19 hectare (ha) (1,21,900 sqm) land at Modasa to the EE for building of Jilla Seva Sadan and other offices. After taking possession of land, the EE conducted (February 2014) Soil Bearing Capacity (SBC) test and Geo-technical investigation of soil. The EE submitted proposal (March 2014) to the Superintending Engineer (SE), Design Circle for preparation of structural designs based on the SBC test and additional requirements intimated by the Collector. In view of the structural designs prepared by SE, Design Circle, the revised proposal for ₹ 36.75 crore was proposed (April 2015) to R&BD. The reasons stated for the same were increase in built up area from 9,510 sqm to 12,500 sqm and changes in structural design necessitated for ground plus four floors against ground plus two floors originally planned and tendered.

The Government approved (May 2015 and May 2016) the revised proposal. The Government also approved (May 2016) the extension of time limit upto

⁵¹ Designs prepared for buildings to be constructed in newly created districts.

December 2015. Meanwhile, the contractor completed (December 2015) the work at a cost of ₹ 29.63 crore.

As per tender condition, for the quantities executed in excess of 130 *per cent* of the tendered quantities of work, payment shall be made as per the rates mentioned in the Schedule of Rates (SoR) of the year during which the excess quantities were first executed, irrespective of the tendered rates. For quantities executed upto 130 *per cent* the tendered rates would be applicable.

Audit observed (May 2016) that based on the final execution of the work, excess quantities were involved in 97 out of total 157 items of works. In 81 out of 97 items the quantity execution was beyond 130 *per cent* of the tendered quantity. As the SoR 2013-14 was also applicable in 2014-15, in 66 out of the 81 items the SoR rates was higher while in the remaining 15 items the SoR rates was lesser against its tendered rates. This led to net extra expenditure of ₹ 2.36 crore⁵² on the excess items of work executed by the contractor, paid on the basis of SoR.

We also observed that there was no justification on record for the action of R&BD to prepare estimates based on typical designs, invite tender and award the work even before the land was available. The built-up area increased and the structural designs had to be revised as the scope of construction of building was increased from two floors to four floors. Audit is of the view that the subsequent revision of plans and enhancement/ increase in work order quantities could have been avoided if the EE had waited for allotment of land. This not only violated provisions of the Manual but also resulted in additional expenditure.

The Government stated (September 2017) that during execution it was decided to provide revised structural design with probable future expansion considering provision of additional two floors. It was also stated that the built up area of the building was increased to 12,500 sqm as per the revised drawings. Further, increase in the length of compound wall due to larger land area also contributed to the excess/ extra items. The contractor was paid for the extra/ excess items as per the provisions of the tender.

The reply is not convincing because if R&BD had prepared the estimates and invited the tender after allotment of land duly considering the SBC test report and finalisation of structural design, it could have got the opportunity of awarding of work at more competitive price as the prevalent tender was 18.18 *per cent* below the SoR and even subsequent tenders received for similar works during March 2014 to March 2016 were 13.83 to 34.66 *per cent* below the SoR. It could have also avoided incurring of any extra expenditure by way of awarding excess/ extra items of work as per the tender conditions of the tenders invited on SoR rates instead of bid rates in December 2013.

⁵² On the 66 items there was avoidable payment of ₹ 2.40 crore. On the other hand, on 15 items there was savings of ₹ 0.04 crore.

Thus preparation of estimates and inviting tenders without possession of land and finalisation of structural designs led to extra expenditure of ₹ 2.36 crore by way of excess/extra items.

3.8 Improper estimates leading to non-recovery of testing charges

Non-inclusion of certain items of work in the scope of original estimated cost resulted in expenditure on excess and extra works ranging from 16 to 181 per cent of the tendered cost. It also resulted in non-recovery of testing charges of ₹ 1.51 crore.

The Gujarat Public Works Manual *inter-alia* stipulates that care should be taken while finalizing the detailed drawings and estimates of works so as to avoid frequent changes in the works after award of contract on account of extra/excess items. Further, as per the Model Tender Agreement, one *per cent* of the estimated cost of the contract shall be deducted from the Running Account (RA) bill of the contractor for testing the quality of materials and workmanship. No additional testing charges shall be recovered from the contractor. Consequently, in respect of excess/ extra⁵³ items not forming part of the estimated cost, the testing charges cannot be recovered from the contractor.

Audit test-checked eight works as discussed in the **Appendix XII** awarded (between April 2012 to June 2014) by the Executive Engineer (EE), District Roads and Buildings Division (the Division), Ahmedabad. These works were scheduled to be completed between May 2013 and March 2016. Of these eight works, seven works were completed between May 2013 and May 2014 and one work was in progress as of September 2017. The Division incurred an expenditure of ₹ 259.94 crore on these eight works upto September 2017. During the execution of these works, the Government approved (between October 2012 and October 2016) excess items of ₹ 109.59 crore in eight works and extra items of ₹ 1.49 crore in four works.

Case-wise Audit analysis of the inconsistencies in the justification for the excess/ extra works and factors which indicate that these could have been included in the original estimate are given in the **Appendix XII**. A summary of these Audit findings is given below:

- Required strengthening of parts of existing road was not proposed while widening the said road though it was required to avoid undulation in the full road stretch. The same was proposed as an excess/ extra item (Sl. No. 1 of **Appendix XII**).
- Gujarat Engineering Research Institute (GERI) specifications were not fully considered in original estimate. These were later proposed as an excess/ extra item to meet out the requirements. (Sl. No. 2 and 5 of **Appendix XII**).
- Damages in existing roads, which were in existence at the time of preparation of the original estimate, were not considered while proposing

⁵³ Excess items are items, which increase beyond tender quantity given in tender document; Extra items are items, which are completely new and in addition to the items in contract.

the works for widening of the said road. These were later proposed as an excess/ extra item (Sl. No. 3 and 4 of **Appendix XII**).

- Works for filling joints between existing road surface and widened surface to prevent water seepage to the sub-base of the existing road, were taken up later as an excess item. However, this is a necessity in any road widening work to prevent undulation and should have been considered as part the original work. (Sl. No. 6 and 8 of **Appendix XII**).
- Works not included in the original Administrative Approval were taken up as an excess/ extra item in the Bagodara-Dhandhuka-Barvala road by obtaining separate approval though they were additional works requiring separate tender procedure. The costs of the excess/ extra works were 181 *per cent* of the original tendered cost. (Sl. No.7 of **Appendix XII**).

Audit observed (January 2016) that the excess/ extra items were given for execution to the same contractors at their quoted tender rates. The cost of these excess/ extra works ranged from 16 to 181 *per cent* of the original tendered cost. Audit is of the view that lack of funds cannot justify undertaking works with lower than required specifications and later on including the same as excess/ extra works in the original works awarded. It implies that either the works of sub-optimal specifications have been executed which could result in requirement of earlier maintenance or the work was intentionally not included in the original tender to give undue benefit to the contractor(s).

Audit further observed that testing charges which are recovered at the rate of one *per cent* of the estimated cost of the contract could not be recovered for the excess/ extra works since estimates for these works were not included in the original estimates. Audit calculated the costs for the excess/ extra items⁵⁴ not considered in the original estimates at ₹ 151.07 crore implying non-recovery of testing charges of ₹ 1.51 crore from the contractor. The actual, testing charges in respect of the excess/ extra works would therefore, have to be borne by the Department.

The Government stated (September 2017) that the estimates are prepared on the basis of site investigation, design to the extent possible or by adopting quantities as per defined rules and then bids are invited. It was further stated that in some cases during actual construction as per site condition and actual requirement, some extra work in terms of widening and strengthening is required. As per tender clause, these extra works were executed based on site condition and actual requirement.

The reply of the Government is not convincing as the additional work in respect of work at Sl. No. 7 of **Appendix XII** was not part of the approved AA and was not supported with survey and investigation report. Further, in respect of other six works (**Appendix XII**) items were not included in the original estimates due to lack of funds though they were technically required. Subsequently these were included as extra/ excess items for utilization of the

⁵⁴ Estimated cost of excess items was calculated by multiplying the quantity of excess items by item wise rate mentioned in the tender document. Further, for calculation of estimated cost of extra items, the amount was first considered equal to the below percentage of tender and then by increasing it upto 100 *per cent*.

savings in the tender which is not justifiable. Audit is of the opinion that all required items of work as per technical specifications should be executed at one go and the decision whether or not to take up such items cannot be based on the tender rates quoted or availability of savings/ funds at a later stage as it can result in execution of work with sub-optimal specifications.

Thus non-inclusion of certain technically required items of work in the original estimate, resulted in expenditure on extra/excess items and non-recovery of testing charges of ₹ 1.51 crore due to non-inclusion of these items in the estimate.



(GURVEEN SIDHU)
Accountant General

Ahmedabad
The 13 March 2018

(Economic & Revenue Sector Audit) Gujarat

Countersigned



New Delhi
The 15 March 2018

(RAJIV MEHRISHI)
Comptroller and Auditor General of India

