

KARNATAKA NEERAVARI NIGAM LTD



**Karnataka Integrated and Sustainable
Water Resources Management Investment Program**

ADB LOAN No. 3172-IND

Safeguard Monitoring Report

April–September 2019

for

Modernization of Gondi Irrigation System, Karnataka



**Project Management Unit, KISWRMIP
Karnataka Neeravari Nigam Ltd. (KNNL)**

**Project Support Consultant
SMEC International Pty. Ltd. Australia
in association with
SMEC (India) Pvt. Ltd.**



November 2019



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ABBREVIATIONS

ADB	- Asian Development Bank
ASI	- Archaeological Survey of India
CPCB	- Central Pollution Control Board
EA	- Executing Agency
EIA	- Environmental Impact Assessment
EMP	- Environmental Management Plan
CEMP	- Construction Environmental Management Plan
EMMP	- Environmental Management and Monitoring Plan
GoI	- Government of India
GoK	- Government of Karnataka
IA	- Implementing Agency
IEE	- Initial Environmental Examination
IUCN	- International Union for Conservation of Nature
KNNL	- Karnataka Neeravari Nigam Limited
KSPCB	- Karnataka State Pollution Control Board
MFF	- Multi-tranche Financing Facility
MoEFCC	- Ministry of Environment, Forests and Climate Change
NP	- National Park
OM	- Operations Manual
PA	- Protected area
PIU	- Project Implementation Unit
PMU	- Project Management Unit
PSC	- Project Support Consultants
PUC	- Pollution Under Control
REA	- Rapid Environmental Assessment
SEIAA	- State Environment Impact Assessment Authority
SPCB	- State Pollution Control Board
SPM	- Suspended Particulate Matter
SPS	- Safeguard Policy Statement
UNESCO	- United Nations Educational Scientific and Cultural Organisation
WALMI	- Water and Land Management Institute
WLS	- Wildlife Sanctuary



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1. INTRODUCTION

1.1 Project Background

- 1 The Karnataka Integrated and Sustainable Water Resources Management Investment Program (KISWRMIP) is being implemented with financial assistance from Asian Development Bank (ADB). The program aims to enhance security of water resources through modernisation of existing irrigation projects/schemes, improved water resources management in the selected river basins and other associated infrastructure activities.
- 2 KISWRMIP is a multi-tranche financing facility (MFF) program for a period of seven years from 2014 to 2021 in two Tranches (now proposed as three Tranches) with the aim of modernization of irrigation infrastructure of three irrigation subprojects within the Tungabhadra (K-8) sub-basin. Tranche-1 comprises modernization of Gondi irrigation system, Tranche-2 comprises modernization of Vijayanagara channels, while Tranche-3 comprises Tungabhadra Left Bank Canal system. The modernization also includes infrastructure improvements, flow measurement equipment & telemetry system supply and installation, institutional strengthening and capacity building of WUCS (Water Users Cooperative Society), management transfer of Field Irrigation Channels (FICs) to WUCS, and GIS based asset management and operation and maintenance (O&M).
- 3 While Tranche 1 Gondi Modernization is in advanced stages of completion, works have commenced in Tranche 2 Package 1 (excluding OCR and Heritage area), and bid documents are getting ready for Package 2 works (OCR and Heritage Area. The DPR for Tranche 3 for designs preparation, estimates and revision is in progress. Tranche 2 is in advanced stage of loan negotiations.
- 4 The Gondi Irrigation System is located in the Bhadravati Taluk of Shivamogga District. The Gondi Anicut is built across River Bhadra located at about 14.50 km downstream of the Bhadra Reservoir and is 11.56 km from Bhadravati Town. It is situated at latitude 13°46' N and longitude 75°41' E. There are two main canals originating from Gondi Anicut, one each from Left Bank and Right Bank. Left bank canal is 14.50 km long with 20 DPOs for an atchkat (command) of 212 ha and full potential is created under this canal. The discharge required in the canal is 0.56 cumecs (20 cusecs). Right bank canal is 74.40 km long with 16 distributaries and 130 DPOs to cater to an atchkat of 4388 ha. The discharge required in the right bank canal is 7.50 cumecs (265 cusecs) in unlined condition. The Gross Command Area (GCA) is 5060 ha as against the Culturable Command Area (CCA) of 4600 ha; the sanctioned atchkat is 4582.44 ha.
- 5 The Gondi Irrigation System constructed between 1916 and 1926 lies within the Bhadra irrigation system and draws water from it. The system has deteriorated over the years with deferred maintenance, so much so that the flow in the canal system does not reach several portions of the atchkat, in particular, the tail end areas. Return flows from Bhadra Irrigation System contribute to Gondi to reduce water woes in some areas. As the Bhadra system is managed more efficiently, these return flows too will get reduced. Hence, the project on modernization of the Gondi Irrigation System has been taken up under ADB funding.



6 As per the Project Preparation Technical Assistance (PPTA) (ADB TA 7954-IND) Report, the following modernization activities have to be taken up for the Gondi Irrigation System:

- Repairs to the Gondi Anicut and canal headworks and replacement of gates;
- Improvement of main canals and distributaries including provision of concrete lining to suit future water delivery requirements and upgrading canal access roads. Lining is in 80mm thick concreting with pavers;
- Repair/ replacement of all canal structures including bridges and crossings, drainage inlets and relieving weirs, pipe outlets and provision of new structures such as cross regulators where necessary to support the future operational objectives. Cattle ramps and washing ghats are also provided;
- Repairs to two major tanks to enhance storage and command more area or augment canal supplies during lean periods;
- Command area development (CAD) works for lining of Field Irrigation Channels (FICs) and other appurtenant structures;
- Provision of flow measurement devices and telemetry at about 11 locations along the main canal;
- Capacity development of system operations staff and water users through trainings to enable them to effectively use the flow measurement system for providing a more efficient and equitable water distribution service more closely aligned with farmers needs, and
- Agricultural extension and on-farm water management training to equip farmers with skills to use water more efficiently.

7 In line with requirements of ADB Safeguard Policy 2009, an Initial Environmental Examination (IEE) for the project on Modernization of the Gondi Irrigation System was carried out as part of the PPTA. The IEE identified that environmental impacts occur during construction-related activities as listed below:

- Clearance of vegetation along the canal rights of way to provide access and working space for the construction activities;
- Materials generated during excavation where necessary within the existing canals. The total excavation volume is estimated to be about 250,000 m³;
- Filling of about 350,000 m³ to restore the canal cross section and access track. Fill material will either be suitable material from the excavation or from borrow areas;
- Gravel surfacing of canal roads using material from suitable quarries or borrow areas;
- Concrete lining either using mechanised paving equipment, precast concrete units or hand placed concrete. Concrete for paving equipment would be supplied by ready-mixed concrete but concrete for hand-placed lining will probably be mixed on site. Precast units would be stockpiled on site for a brief period before installation;
- Reconstruction of canal structures using reinforced concrete;
- Provision of either concrete field channels or pipes within the command area which will require temporary access over fields.



- Logistics associated with the construction work include extensive movement of trucks carrying soil, gravel for roads and either ready-mixed concrete or materials for concrete. Potentially there could be about 100,000 round trip truck movements of varying truck sizes;
 - The canals under modernisation do not pass through or immediately lie along the forest areas. The Gondi Anicut and Gondi Left Bank canal at the Anicut is within 1 km of a minor forest (sandalwood plantation) and 6 km of a reserved forest (and wildlife reserve) on the left side of the Bhadra reservoir, with the Bhadra Left Bank Canal and settlements in-between. The Gondi Anicut and the Right Bank Canal near the anicut are 2 km from a minor/State forest with settlements in between. It is 11 to 12 km from the Wildlife and Tiger Reserve with the Bhadra Right Bank canal and settlements in-between. Elsewhere the canal is more than 2.5 km from reserved forest with the Bhadra Right Bank canal and settlements in-between;
 - Modernisation works for each site will occur just once and activity at any one location will last a few days. Passing traffic will increase for most of that closure period. Overall, modernisation is expected to take place during canal closure periods which is generally between Mid-May to End-June and End-November to Mid-January every year.
 - It is expected that about 213,000 m³ of material will be excavated from the canal. The excavated material is expected to be either used for construction purposes or disposed of on adjoining fields.
- 8 Accordingly, the IEE recommended that the Modernization of the Gondi Irrigation System be implemented on the condition that the Environmental Management and Monitoring Plan (EMMP) provided in the IEE is adhered to and complied with fully by the Project Proponent for all phases of the project.
- 9 The objective of the implementation of the Environmental Management and Monitoring Plan is to reduce or even negate the negative impacts arising from the modernization of the Gondi Irrigation System project.
- 10 As part the EMMP, it is required for the Project Proponent to prepare Monitoring Reports at regular intervals and submit the same to the relevant agencies. This Environmental Safeguard Monitoring Report captures the progress achieved in the implementation of the EMMP during October 2018 – March 2019.

1.2 Executing Agencies

Project Proponent

The Chief Engineer
Karnataka Neeravari Nigam Limited
Project Implementation Office
Upper Tunga Project Zone, Shivamogga.



The Contractor

RPP Infra Projects Limited

Registered Office at:

SF No. 454, Raghupathynaiken Palayam, Railway Colony (Post)

Poondurai Road, Erode 638 002

Tel: +91 (424) 228 4077; Fax: +91 (424) 228 2077.

Email: ao@rppi.com; Website: www.rppi.com

1.3 General Project Features

- 11 The overall objective of the project is to modernise the irrigation infrastructure of the 4,600 ha Gondi Irrigation System so that a fully functioning irrigation system is in place. WUCS are trained, among others, in irrigation management, equitable distribution of water, O&M of canals, and collection of irrigation water charges. WUCS are also empowered with knowledge and skills so as to be able to interact with service delivery agencies including KNNL/CADA, Agriculture Department, Horticulture Department and other Departments.
- 12 The goal is to significantly improve water use efficiency coupled with an increase in agricultural productivity which in turn is expected to substantially improve the income of farmers. The project shall also address the fact that the Gondi canal has, for many years, received supplementary water as return flows from the adjacent Bhadra canal system but this source of water is diminishing as that system becomes better managed.
- 13 The following are the major project components:
 - Modernization of the Gondi Canal system;
 - Institutional Strengthening of WUCS and capacity building;
 - Improved Water tax collection and O&M at all levels of the system;
 - Strengthening of KNNL and CADA System Management;
 - WUCS and Sustainable agricultural development, and
 - GIS based asset management and Operation & Maintenance by WUCS.
- 14 Specific interventions included:
 - Repairs to Gondi Anicut and canal headworks.
 - Improvement of main canals and distributaries including provision of concrete canal lining and upgrading of canal access roads.
 - Repair/ replacement of all canal structures including bridges and crossings, drainage inlets and relieving weirs, pipe outlets and provision of new structures such as cross regulators, cattle ramps and washing ghats.
 - Repair of major tanks to increase their storage capacity for augmenting the supplies during higher demand or lean periods. Modification of current on-line storage tanks where feasible to become actively managed off-line storage and enhancement of existing off-line tanks.
 - Remodelling of the drainage inflow and relieving weir arrangement to avoid water (and associated sediment) entering the main canals unless required.
 - Managed conjunctive use of canal water, water stored in tanks and groundwater where possible. Small pilots of gravity pressurised irrigation from the main canal.



- CAD works comprising lined field irrigation channels and construction of all relevant appurtenant structures, canals, low-pressure gravity supplied pipe distribution and improved drainage;
- Provision of flow measurement with telemetry at 11 locations along the main canal. Installation of an automatic weather station in Gondi command area. Flow measurement and control systems will also be provided for the Bhadra canal system and selected locations on other irrigation schemes in the K-8 sub-basin;
- Capacity development of the main system operations staff and water users;
- Strengthening of WUCS for effective water management, sustainable agriculture and O&M;
- Agricultural extension and on-farm water management training. Agricultural interventions to support implementation include: (i) Promoting organic farming and soil fertility (ii) irrigation water savings and IWRM (iii) Cropping patterns and intensification (iv) Farm mechanisation (v) Chemicals and Pest Management (vi) Agricultural extension and communications (vii) Research and demonstration.
- Asset mapping using a GIS software; development of an android based smartphone application to aid in updating agriculture and other data. Training of select WUCS members on the application.

1.4 Project Implementation Schedule

15 The 7-year project is being implemented during 2014-2021 in two tranches: the first 4-year Tranche 1 to be followed by a 6-year Tranche 2 planned to commence after one year of Tranche 1.

16 **Reporting Period:** April-September 2019.

17 Major works carried out include;

- Establishment of the Workers' Campsites;
- Establishment of Concrete Batching Plant;
- Site Clearance for construction activities;
- Desilting works;
- Construction of Canal lining and structures;
- Construction of Distribution structures.

1.5 Physical Progress of Civil Works

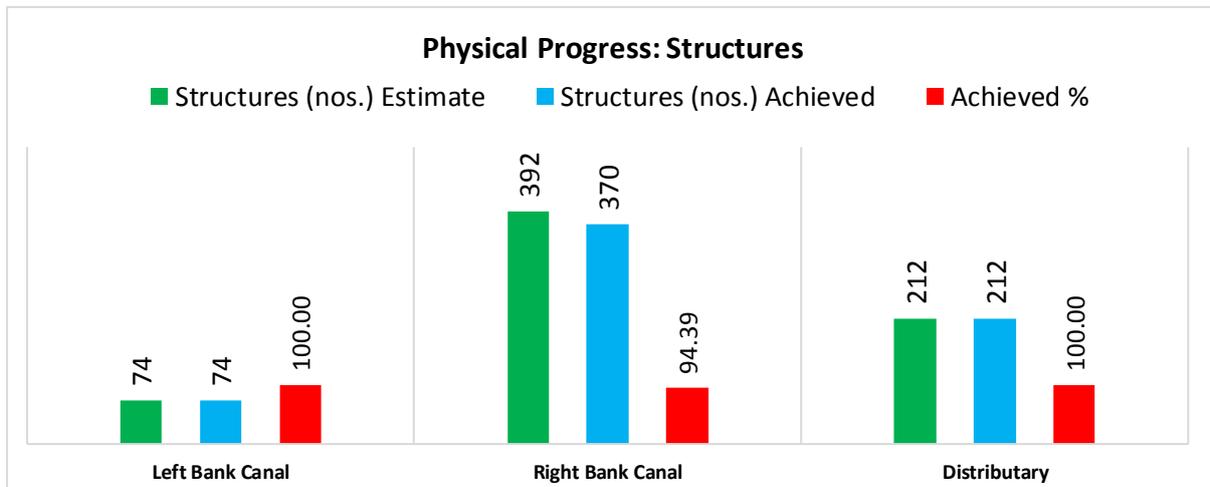
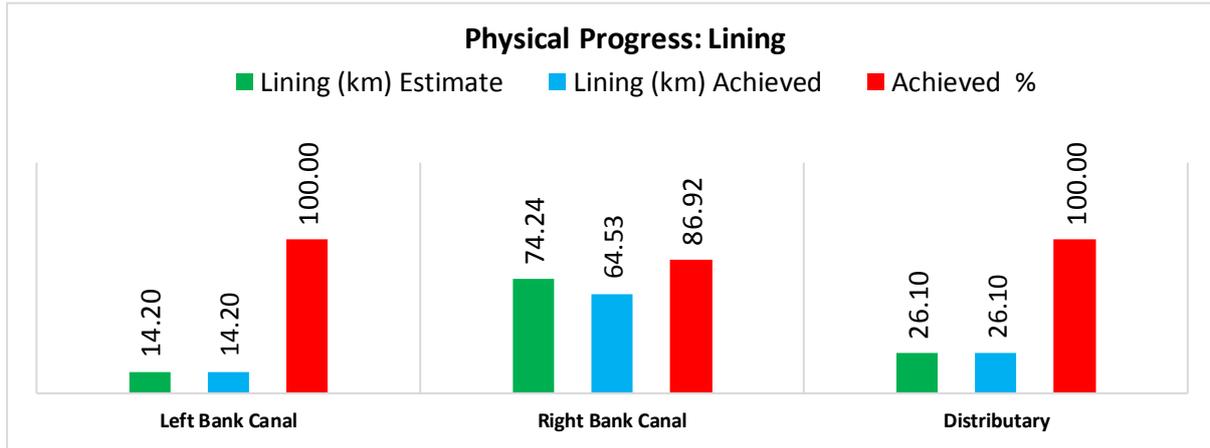
18 Initially, the Contractor was awarded the work at an estimated cost of Rs. 112.21 Crores. However, there was a need for increased quantity of certain items due to embankment issues. Hence, an EFI was for additional quantities amounting to Rs.16.73 Crores was submitted in 2018 by KNNL which was approved by ADB. The total balance work amounting to Rs.40 Crores has been considered as the new base against which the physical progress is 27% and financial progress is 35%. The S-curves indicate the program for January-December 2019.

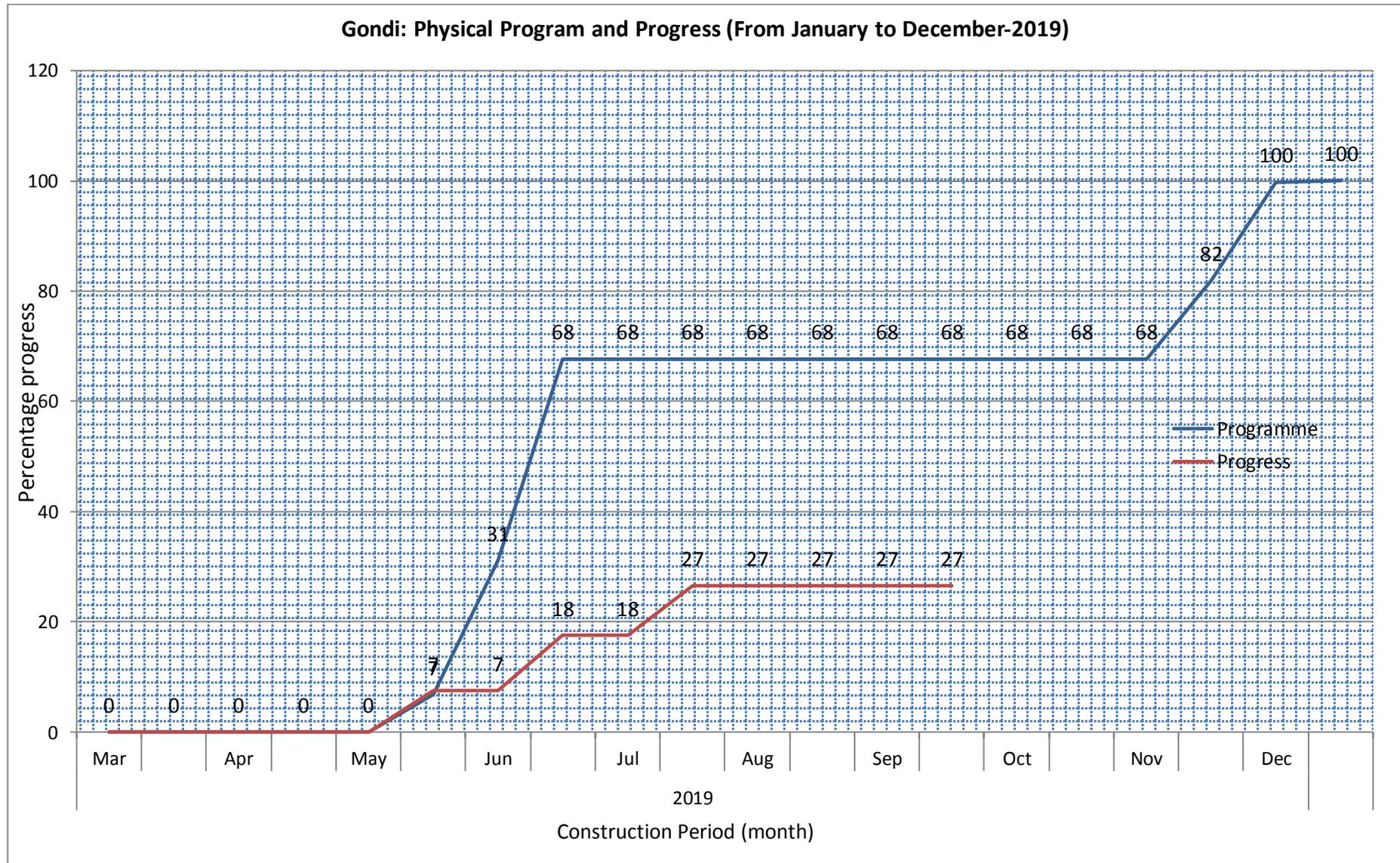
19 **Table 1** provides the status of major works of the Project:

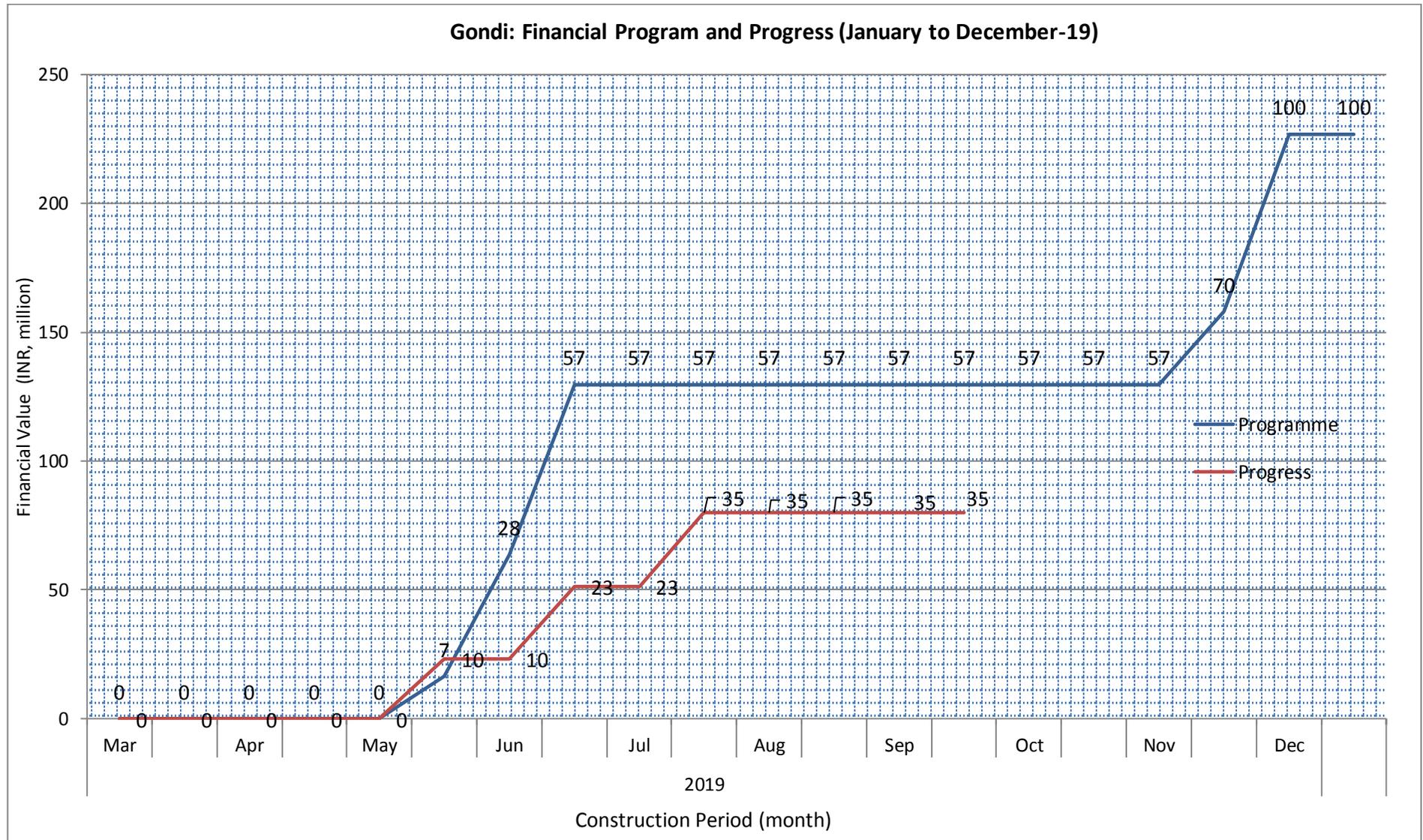


Table 1: Physical Progress of Works as of 30 September 2019

S. No	Component	Lining (km)			Structures (nos.)		
		Estimate	Achieved		Estimate	Achieved	
		Km	Km	%	Nos.	Nos.	%
1	Left Bank Canal	14.20	14.20	100.00	74	74	100.00
2	Right Bank Canal	74.24	64.53	86.92	392	370	94.39
3	Distributaries	26.10	26.10	100.00	212	212	100.00









Community Participation Works

20 In an innovative departure from regular practice, the CAD works are awarded to WUCS as Community Participation Packages as per ADB guidelines. Accordingly, all the 11 Water Users Cooperative Societies have been strengthened through appropriately designed capacity building programmes. A total of 236 contracts have been directly awarded to WUCS as of reporting period out of a total of 243 envisaged. The CAD works are in advanced stages of completion. Technical support is being provided by KNNL, CADA and the PSC to ensure quality and standards.

Tables 2 and 3 provide the status of CAD works:

Table 2: CAD Physical Progress as of 30 September 2019 (Phase-1) 130-Packages

S. No	Name of the WUCS	Lining (km)		Achieved
		Estimated	Achieved	%
1	Doddagoppenahalli	10.77	10.17	94
2	Baranduru	27.32	25.57	94
3	Seegebagi	11.37	11.10	98
4	Baballi	23.44	23.44	100
5	Kagekodamagge	11.36	11.36	100
6	Talrikatte	11.40	11.30	99
7	Nagatibelagalu	15.16	15.16	100
8	Dasarakallahalli	18.38	15.95	87
9	Koppadoddakere	16.11	14.58	91
10	Holehonnuru	11.25	9.81	87
11	Mudalavittalapura	9.20	8.00	87

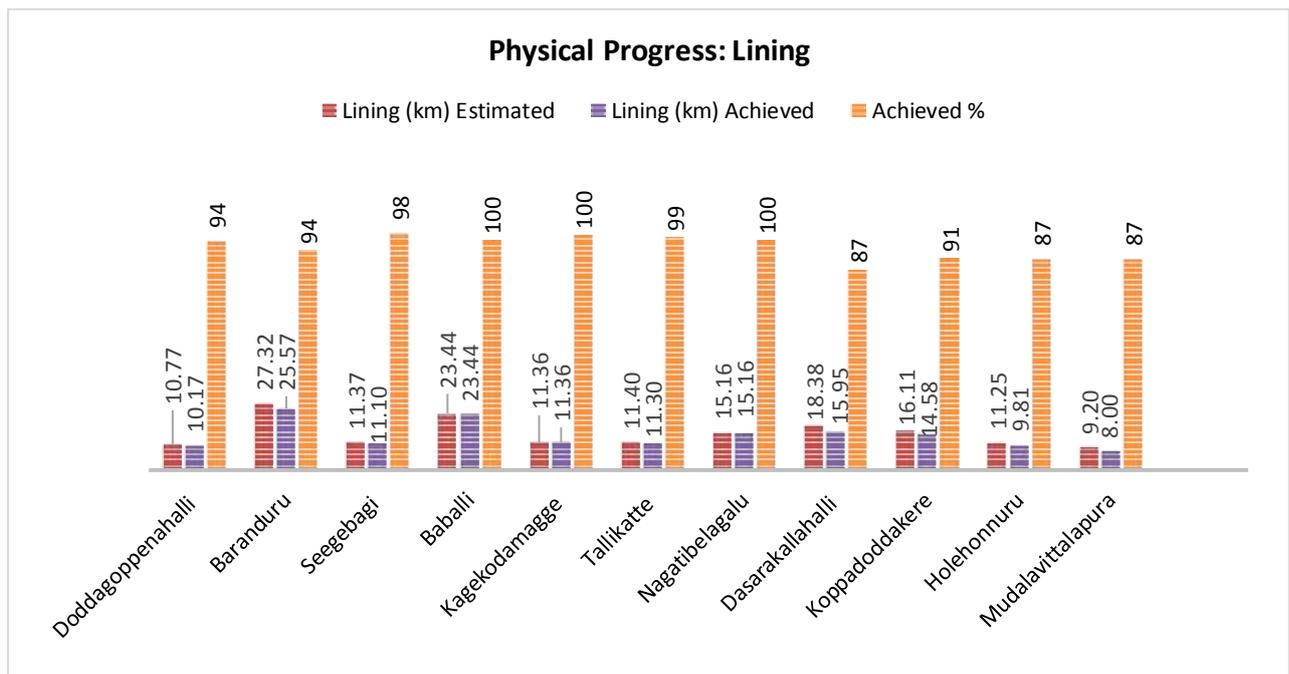




Table 3: CAD Physical Progress as of 30 September 2019 (Phase-2) 82-Packages

S. No	Name of the WUCS	Lining (km)		Achieved
		Estimated	Achieved	%
1	Doddagoppenahalli	4.89	3.64	74
2	Baranduru	11.43	11.43	100
3	Seegebagi	6.22	6.22	100
4	Baballi	16.95	15.88	94
5	Kagekodamagge	9.75	8.98	92
6	Talilikatte	8.35	7.50	90
7	Nagatibelagalu	13.42	12.16	91
8	Dasarakallahalli	12.30	3.10	25
9	Koppadoddakere	16.35	11.63	71
10	Holehonnuru	5.51	3.12	57
11	Mudalavittalapura	6.27	4.21	67

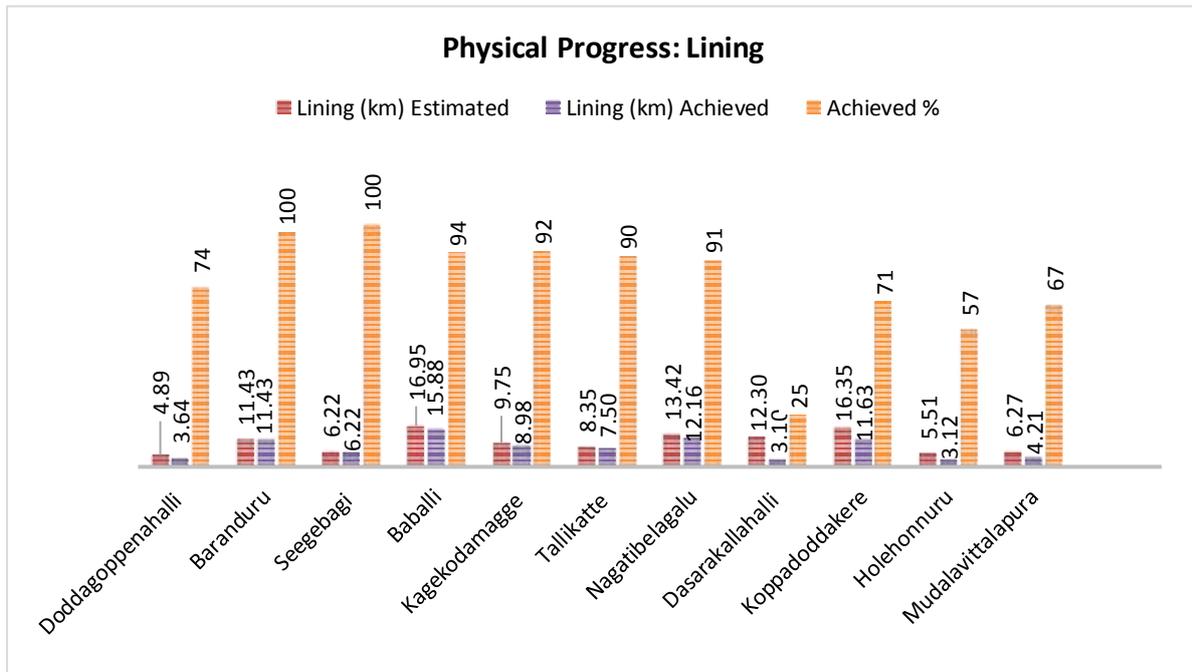
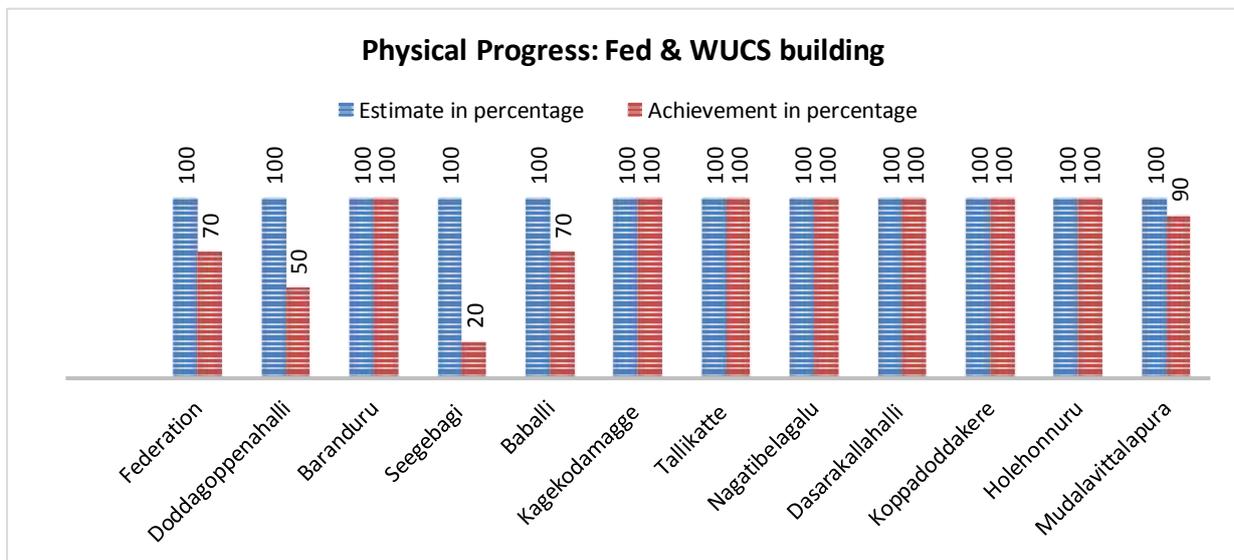


Table 4: Physical Progress as of WUCS Building Works as of 31 October 2019

S.No	Name of the WUCS	Estimate in percentage	Achievement in percentage	Remarks
1	Federation	100	70	Plastering in progress
2	Doddagoppenahalli	100	50	Plinth beam
3	Baranduru	100	100	completed
4	Seegebagi	100	20	Earthwork excavation
5	Baballi	100	70	GF Plastering, 1 st floor RCC



S.No	Name of the WUCS	Estimate in percentage	Achievement in percentage	Remarks
6	Kagekodamagge	100	100	Completed
7	Tallikatte	100	100	Completed
8	Nagatibelagalu	100	100	completed
9	Dasarakallahalli	100	100	completed
10	Koppadoddakere	100	100	completed
11	Holehonnuru	100	100	completed
12	Mudalavittalapura	100	90	Plastering in progress



1.6 EMMP and Schedule of Implementation

21 The Environmental Management and Monitoring Plan (EMMP) follows the Project Implementation Schedule and consists of three phases viz., pre-construction, construction and operational phases.



2. ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

2.1 EMMP Implementation: *Pre-Construction Phase*

- 22 As reported in the previous Safeguard Monitoring Report (SMR), the Contractor, RPP Infra Projects Limited (hereinafter referred to as RPP) signed an agreement with KNNL dated 26 February 2016 to execute the main civil works of the Gondi Irrigation System. As per mandatory requirements of environmental safeguards spelt out in the Contractor's contract, RPP initially submitted an inadequate Environmental Management Plan (EMP) which was reviewed by PSC. Subsequently, RPP submitted a revised EMP on 30 August 2016. Because of the inherent inadequacies in the Contractor's Modified EMP as well, the PSC provided an Action List to be carried out by the Contractor in order to adhere to environmental safeguards; the same was detailed in the SMR of October 2016–March 2017. KNNL instructed the Contractor to follow the Action List on EMP. The evaluation of the Contractor's environmental performance is based on the Action List.
- 23 Accordingly, the Contractor appointed a General Manager (Projects) to head the Contractor's Environment Team and is supported by 2 managerial-level staff and 2-supervisory-level staff members.

2.2 EMMP Implementation: *Construction Phase – Role of Contractor*

- 24 The PSC assessed the Contractor's performance during the period April-September 2019. The following comprise the key set of EMP actions carried out by the Contractor during the current Construction Phase to mitigate the environmental impacts:
- i. The Contractor has taken Workers' Compensation Insurance covering 25 workers valid until 07 May 2020, coinciding with his contract period. The Workers' Compensation Insurance is in addition to the Contractor's All Risk Policy that covers the project components.
 - ii. After closing of the Timlapura Batching Plant during the April-September 2018 Safeguard Monitoring Period, the Contractor executed the project with only the Old Devanarasipura-Kodihalli Batching Plant operating. The location of the Old Devanarasipura-Kodihalli Batching Plant was approved by the local authorities along with the Consent to Operate permit obtained from the Karnataka State Pollution Control Board.
 - iii. The vehicles used by the Contractor have the mandated Pollution Under Control (PUC) Certificates issued by concerned authority. During the present reporting period 18 vehicles have been deployed. The PUC certificates of all these vehicles have been scrutinized by PSC from time to time and enclosed as a part of the report.
 - iv. The Contractor continued to maintain the worker camp site at the same location as the batching plant after obtaining due permission from the local authorities. The contractor has also continued to provide and maintain the basic infrastructure and facilities for drinking water supply, sanitation and a kitchen mess. Separate sanitation facilities for women working at the Old Devanarasipura-Kodihalli Campsite have been provided. Provision for mass cooking is also made. Health and hygiene aspects continue to be taken care of



- by the Contractor through installation of septic tanks and composting units for treatment of kitchen waste. Source segregation of waste has been introduced and dry waste recycled since April 2017. Water sprinkling measures are introduced to check dust generation arising due to movement of vehicles and operation of batching plant at the campsite location.
- v. As mentioned in the Safeguard Monitoring Report (October 2017 – March 2018), the operation of both the Batching Plant and the Campsite at Timlapura was closed during the same monitoring period. The closure activities carried out by the Contractor included removing all the structures erected at the campsite, levelling the land and restoring the *status quo ante* condition of the area so that it is suitable for any subsequent activities that the land-owner may choose to carry out. The Contractor, at the request of the land-owner, retained the bathrooms and other sanitation facilities constructed for the workers. Hence, it is concluded that the closure conditions have been duly met by the Contractor. Photographs during April-September 2019 are enclosed as a part of SMR.
 - vi. Further, to ensure that the land and water sources are not contaminated, the Contractor was instructed to initiate environmental sampling and monitoring of groundwater and surface water at certain locations in and around the closed construction camp site. As of now, no post-closure environmental monitoring has been carried out by the Contractor as the works are still going on. Also, the PSC has instructed the Contractor to obtain written declaration from the land owner regarding the condition of the site. The results of the environmental sampling and the land-owners' written declaration will be provided in the final SMR.
 - vii. It was ensured that the Contractor accorded high priority to safety aspects. Materials have been stored at pre-designated spots at the batching plant location and appropriate safety sign boards placed to ensure safety of the workers. Fire extinguishers have been kept at prominent locations at the camp sites as a precautionary measure. Similarly, the Contractor has placed appropriate safety sign boards warning nearby residents about the periodic movement of trucks and other vehicles. Further, the Contractor has been holding periodic consultations with the surrounding inhabitants for taking additional measures, if any, towards ensuring good health and the well-being of the nearby communities. All such deliberations have been recorded in a register maintained by the Contractor. Similarly, a labourer's camp near the construction sites have been provided with basic infrastructure and facilities such as for drinking water supply, sanitation facilities and firewood for cooking. Photographs and maps showing location of the campsite, facilities and borrow area locations have been provided in the previous reports.
 - viii. About 234 trees from along the canal lengths have been cut as they were blocking the movement of vehicles and equipment. Maps showing the locations of trees removed have been provided in the previous SMR. As per the EMP, the Contractor has to carry out compensatory tree planting in the ratio of 5 trees to 1 cut. The Contractor purchased the identified and agreed species of saplings from the Karnataka Forest Department. Accordingly, compensatory afforestation activities were carried out in public areas such as government schools, roadside and borders of private farm lands.



- ix. Another critical project component is desilting of canals. Farmers from surrounding areas evinced interest in the silt from the canals; they have voluntarily collected and spread it in their private farm lands. Thus, any adverse environmental impact likely to arise from silt disposal has been largely mitigated. Prior to April 2017, there have been a few instances of the Contractor disposing contaminated silt at locations not approved by the KNNL and KSPCB; however, after necessary instructions, no such incident has been reported or found so far. PSC has been monitoring this aspect closely.
- x. The contractor also faced another major issue in terms of procurement of construction material like stone jelly and sand for construction work. Contractor has been procuring stone jelly from government approved quarries having valid consent from KSPCB to establish and operate. Materials, primarily stone aggregates, were procured during the October-December 2018 period from these approved quarries.
- xi. The Contractor continued to procure manufactured-sand (M-Sand) from approved vendors as reported in the previous SMR. Hence, environmental impact arising from mining of sand from surface water bodies has been mitigated to a large extent. Thereafter, water was released to the canals for irrigation on August 5, 2019 and the works were not taken up.
- xii. Another major natural resource requirement in the project is the filling material. The filling material has been obtained from borrow pits dug up at locations approved by the local village community and the KNNL. In fact, KNNL allots borrow areas with due approval from the local community. The borrow areas are at M.C. Halli, Baranduru, Kodihosuru, Kanasinakatte, Mavinakere and Danayakapura. Of these, the MC Halli, Baranduru and Mavinakere borrow areas have not been utilised for the project. A map indicating the locations of the active/ closed borrow areas has been provided in the previous SMR. The Dananayakapura borrow area has been dug up for filling material to the extent that it was approved; presently, the local farmer who owns the land, is utilising the land to plant betel nut trees. At the Kanasinakatte borrow area, thus far, about 80% of the allotted volume of filling material has been utilised. Also, the borrow pits are dug up to such a depth that the natural drainage in the area is not adversely impacted.
- xiii. The Contractor is also taking up borrow-pit closure activities to maintain the environmental integrity of the borrow pit location. The Dananayakapura borrow pit closure activities have gained acceptance and appreciation from the local community. The closure activities for the Kanasinakatte borrow location shall be initiated soon after the allotted volume is extracted. During the current reporting period 0.725km stretch of canal lining could not be completed due to release of water.
- xiv. It is planned to complete balance of 0.725km lining during canal closure period. Upon completion of the balance work, the Contractor shall schedule a closure meeting with the local community in order to ensure that the community is satisfied with measures taken by the contractor to safeguard environmental quality and health and safety of the community at the construction activities.



Deliberations of such closure meetings are recorded in a register maintained by the Contractor.

- xv. Over the project duration so far, there has been a marked improvement in the documentation of the implementation of the environmental management plan by the Contractor. Presently, the following key aspects are being documented by the Contractor:
- Approvals from the concerned land owners for disposal of silt on private farm lands;
 - Approvals from Gram Panchayat/ Individual land owners (as the case may be) for utilisation and proper closure of burrow areas;
 - Approvals from Gram Panchayat/ Individual land owners (as the case may be) for proper closure of the construction camp sites.

25 Private land has been used for meeting Contractor's requirements such as setting up of the two campsites and establishing two borrow areas. **Table 5** provides the details.

Table 5: Private Landholdings used for Project Activities and Status

S. No.	Land Access for	No. of Households or private land owners affected	Agreement	Status of the Site
1	Campsite – Devanarasipura Kodihalli	One	Between Contractor and Owner	In use
2	Campsite – Timlapura	One	Between Contractor and Owner	Closed
3	Burrow Area - Dananayakapura	One	Between Contractor and Owner	Closed
4	Burrow Area – Kanasinakatte	One	Between Contractor and Owner	In use

- i. PSC has observed that over the project duration there has been a marked improvement in terms of the Contractor ensuring effective implementation of environmental, health and safety measures for the workers. These measures include ensuring that all approvals are in place, utilisation of the Personal Protection Equipment, carrying out periodic health monitoring of the workers and encouraging workers to come up with suggestions for improving the environmental, health and safety practices.

26 Detailed performance assessment of EMP implementation by the Contractor is provided in **Appendix I**.

2.3 EMP Implementation - Role of Other Institutions

27 The PPTA also defined the role of institutions such as ACIWRM, KNNL and other agencies in implementing the Environmental Management Plan. The key set of actions that have been carried out by other institutions during EMP Construction Phase are as follows:



i. Role of ACIWRM

- 28 Advanced Centre for Integrated Water Resources Management (ACIWRM) was established as a think tank to the Government of Karnataka's (GoK) Water Resources Department (WRD) in the year 2011-12. A first-of-its-kind institution in India, ACIWRM was established to create an enabling environment for the GoK to pursue its objective of moving towards achieving water and food security. The IWRM framework provided the opportunity to integrate the land and water related management aspects at the sub-basin and river-basin levels.
- 29 The ACIWRM engages in policy analysis, research, planning, capacity building and developing the knowledge base to gear up the WRD for achieving its 2030 vision. The ACIWRM works with the various Departments, civil society, the private sector, farmers and water users associations and other organizations to produce integrated advice to the WRD for managing the state's water resources.
- 30 Under the ADB-funded Karnataka Integrated and Sustainable Water Resources Management and Investment Program (KISWRMIP) major activities taken up by ACIWRM include: development of a GIS-based spatial system, Karnataka Water Resources Information System (KWRIS) that brings together aspects of surface water, ground water and water dependent ecosystems for decision making; preparation of an IWRM Training and Capacity Building Strategy for government staff and farmers, and River Basin Planning to support development of state IWRM strategy.
- 31 The PPTA has identified a number of environmental issues, and ACIWRM is one of the responsible institutions. The status of the action plan implemented by ACIWRM to address these environmental issues was discussed with Director (Technical) and other experts at their office on 21 March 2019. The key actions along with progress are given in the following:
- ACIWRM has developed the State IWRM Policy and Strategy using a participatory approach that would address the needs of each sector including aspects on environmental flows, preventing reduction and degradation of habitats for both aquatic and terrestrial species. The revised State Water Policy has been submitted to the State Government in May 2017 and is awaiting clearance from the State Government.
 - ACIWRM has been selected as the nodal agency for the "National Groundwater Management Programme" in Karnataka and has prepared a detailed project proposal for certain areas of the state and the proposal has been submitted to the Expenditure Finance Committee of the Government of India. While the GOI has approved the program the implementation is yet to start. The program covers the water-stressed areas of the state.
 - Participative Land and Water Management Plans is being developed by ACIWRM. These plans focus on improving water-use efficiency and water productivity. Also, these plans address issues concerning improved management and use of agri-chemicals. Upon finalization of the plans, these plans are expected to be implemented in the Tungabhadra Basin under Tranche 2 and 3 funding.
 - ACIWRM is conducting climate change related studies in association with Indian Institute of Science and Visvesvaraya Technological University. The results and



these studies and the IWRM Policy developed shall be used to finalize options for best management of tank areas and off-line storages.

ii. Role of KNNL

- 32 KNNL has ensured that the environmental impacts are mitigated during all stages of the project through appropriate actions at specific instances. Initially KNNL included the EMP as part of the Bid Document and later in the Contract Agreement, as well thus making it mandatory for the Contractor to adhere to the EMP. KNNL has deputed senior officers to monitor the EMP implementation. KNNL has also assisted the Contractor in working with other stakeholder agencies such as the Gram Panchayats, CADA, KSPCB and WUCS so as to enable the Contractor to easily comply with the objectives of the EMP. Finally, KNNL as the PMU, has submitted the Six-Monthly Safeguard Monitoring Reports regularly to the ADB.
- 33 The Project has also established a Grievance Redressal Mechanism to facilitate recording and redressal of grievances. As part of the Grievance Redressal Mechanism, complaint registers are maintained at WUCS, Federation and KNNL offices. In addition, a Gondi WhatsApp group (PIO Gondi) was set up in October 2017 with multiple objectives: (i) to disseminate information about various activities under Gondi modernization; (ii) sharing information/progress about main civil works and CAD works; (iii) communication exchange about meetings of KNNL, Gondi Federation, etc.; (iv) recording of grievances. It is observed that the medium of WhatsApp has been quite popular among WUCS and farmers for registering their grievances. Not only that the grievances were recorded, but the concerned persons/agencies such as KNNL, CADA and the contractor have also responded. The grievances registered are categorized into four types (**Table 6**):
- i. **Water Release:** related to timing and quantity; of the complaints registered **25%** relates to water release.
 - ii. **Civil Works:** related to start of CAD works, problem observed in main canal civil work, fixing of sluice gate, etc.; of the complaints registered **12.5%** are of the civil works category.
 - iii. **Functioning of WUCS and Federation:** relates to date of review meetings, workshops and trainings, monitoring by Federation CEO, etc.; No complaint has been registered under this category.
 - iv. **Agriculture:** No complaint related to agriculture has been made.
 - v. **Operation and Maintenance:** relates to deposition of silt and clogging of water in canals, weed growth in canals, damage and repair works in canals, etc.; around **62.5%** of the complaints registered are under this category.

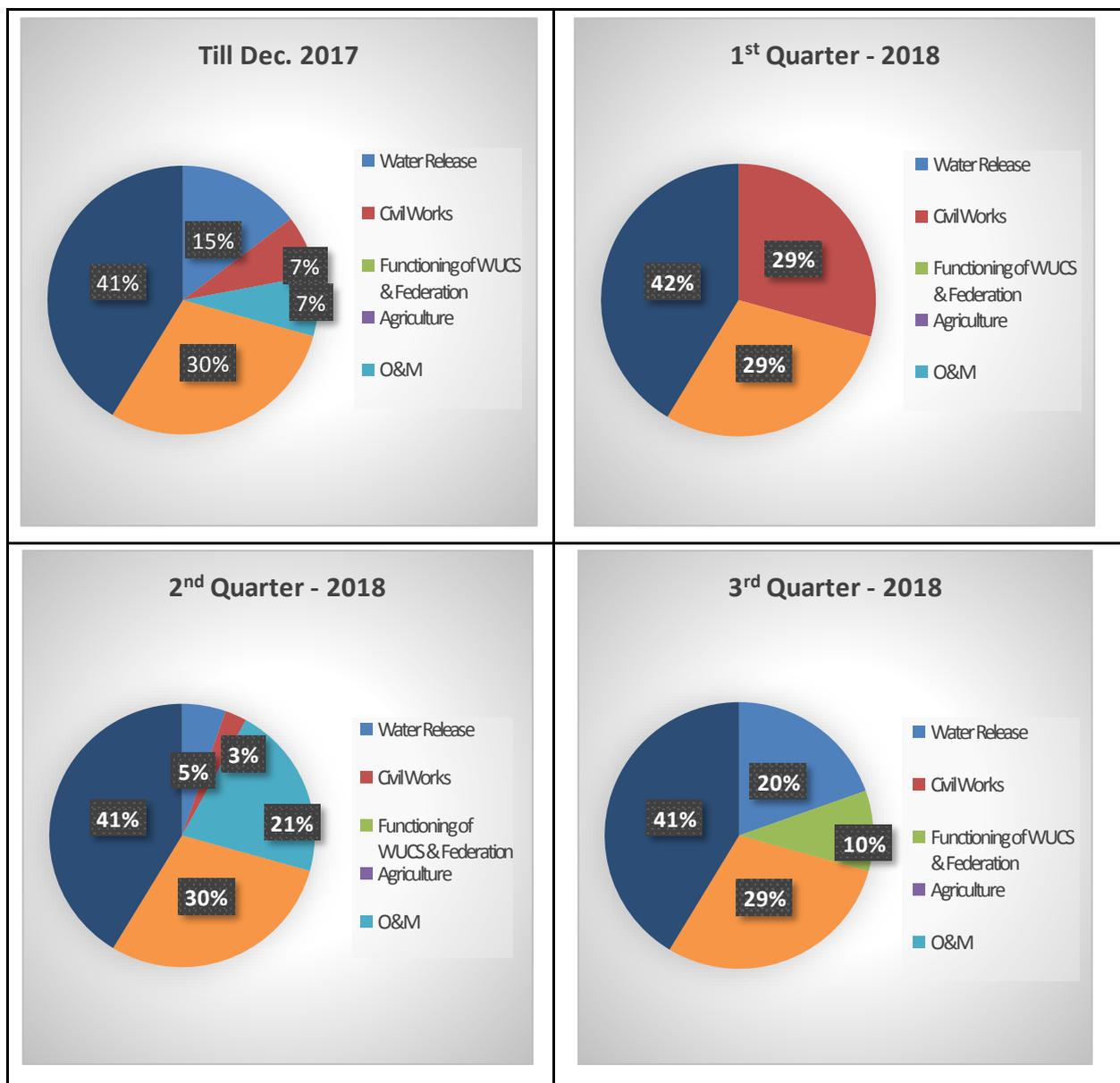
Table 6: Summary of Grievances Registered

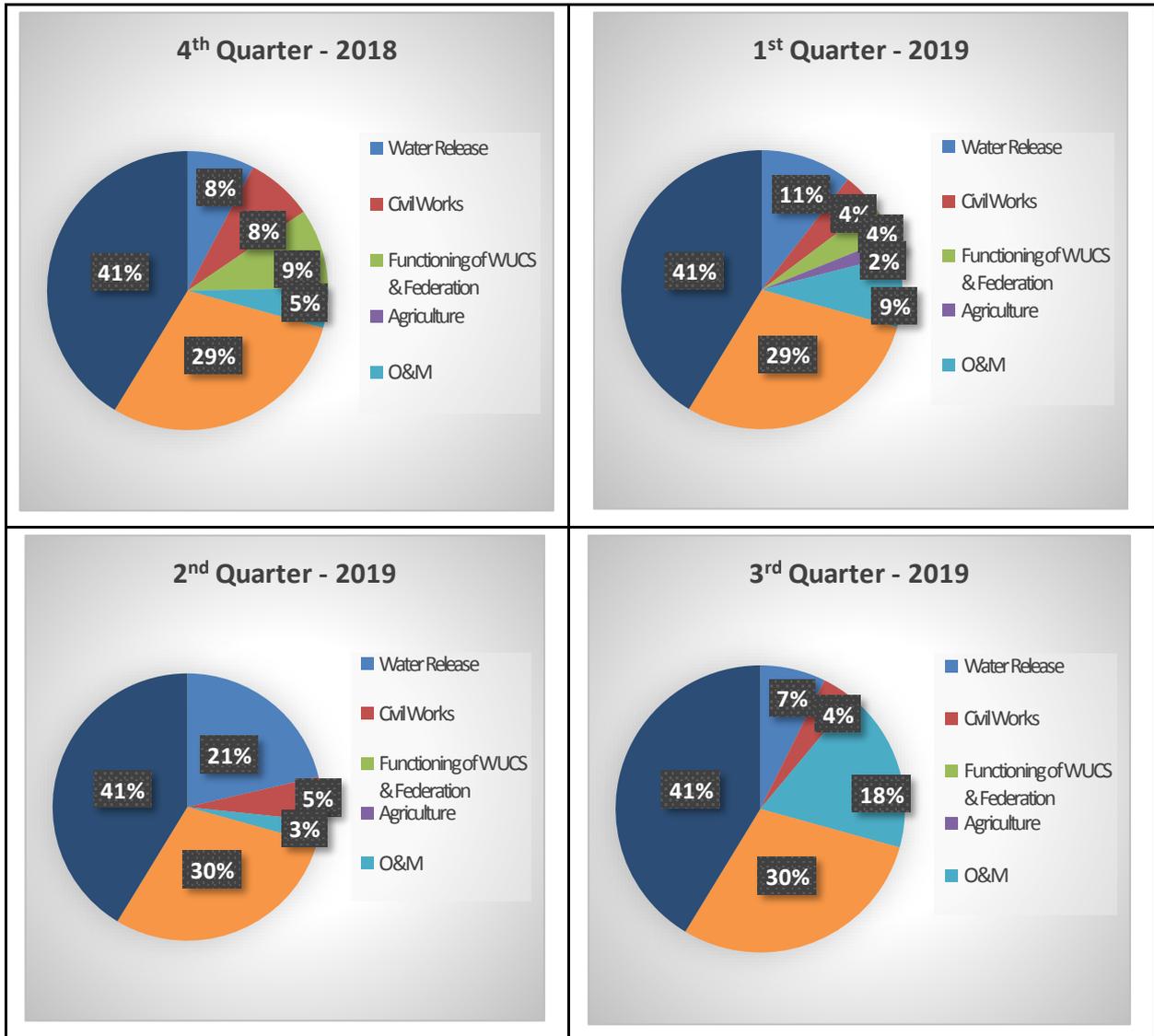
Period	Water Release	Civil Works	Functioning of WUCS & Federation	Agriculture	O&M	Total	%
Till Dec. 2017	2	1	0	0	1	4	5.63
1 st Quarter - 2018	0	1	0	0	0	1	1.41
2 nd Quarter - 2018	2	1	0	0	8	11	15.49



Period	Water Release	Civil Works	Functioning of WUCS & Federation	Agriculture	O&M	Total	%
3 rd Quarter - 2018	2	0	1	0	0	3	4.23
4 th Quarter - 2018	5	5	6	0	3	19	26.76
1 st Quarter - 2019	5	2	2	1	4	14	19.72
2 nd Quarter - 2019	8	2	0	0	1	11	15.49
3 rd Quarter - 2019	2	1	0	0	5	8	11.27
Total	26	13	9	1	22	71	100

34 The details of complaints registered under different categories over the time from last quarter of 2017 to 4th quarter of 2019 is presented in the pie charts below:





35 An analysis of the complaints registered since 2017 shows that the highest number of complaints were registered during the quarter October-December 2018 (26.76%). This can be attributed to the increasing awareness and involvement of the farmers. Overall, 36.61% of complaints related to water release in terms of timing and quantity, 31% to O&M, and 18.31% about the ongoing civil works. All the 71 complaints registered have been addressed to the satisfaction of the complainants by the concerned-KNNL/ CADA engineer and the contractor.

36 During the period April 2019-September 2019, 25% complaints related to water release in terms of timing and quantity, 29% on O&M and 14% each on on-going civil works and Agricultural issues. Around 7% on the functioning of WUCS and Federation.

iii. Role of CADA and WUCS

37 Command Area Development Authority (CADA) and Water Users Cooperative Societies (WUCS) are institutions that deal with on-land farm management issues. While CADA is an institution under the Water Resources Department, Government of Karnataka, the WUCS is an independent-farmer-managed cooperative society



established under the State Cooperatives Act, 1958 with farmers as the sole members of the society. One of the main aims under the current project is to strengthen these institutions on on-land farm management aspects. Towards this, the Project Support Consultants (PSC) through its Support Services Team has conducted various training programmes to the WUCS members and farmers of the area.

Trainings Conducted by PSC

38 **Table 7** gives a list of training programmes carried out by PSC.

Table 7: Training Programmes carried out for WUCS members and farmers during April-September 2019

S. No	Name of WUCS	Topic of Training	Date	No. of Participants		
				Male	Female	Total
1	Kagekodamagge	Training on Operation and Maintenance - planning for water distribution in command area	10.4.2019	28	3	31
2	Kerebeeranahalli	Training on Entrepreneurship Awareness Programme (Tailoring)	18.04.2019	0	22	22
3	Kerebeeranahalli	Training on Tailoring - Commencement Day	24.04.2019	2	30	32
4	Doddagoppenhalli	Training on Women sub-committee and its functioning	25.04.2019	0	21	21
5	Kerebeeranahalli	Formal Inauguration & Orientation to Tailoring Trainees	26.04.2019	6	34	40
6	SST Office	Progress review meeting and orientation to WUCS and Federation	26.04.2019	24	2	26
7	Holehonuru	Training on Tailoring - Commencement Day	26.04.2019	6	52	58
8	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	02.05.2019	2	4	6
9	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	03.05.2019	0	8	8
10	Kerebeeranahalli	Training on Self-Employment Programmes	03.05.2019	1	35	36
11	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	04.05.2019	9	1	10
12	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	04.05.2019	7	0	7
13	Mudalavittapura	Training on Disha Ready Study for Entrepreneurship Development	06.05.2019	8	30	38
14	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	06.05.2019	10	0	10
15	Hale seegebege	Exposure visit on Paddy Cultivation and Organic Farming	06.05.2019	5	1	6
16	SST Office	Progress review meeting and orientation to WUCS and Federation	07.05.2019	25	3	28
17	Hosahalli	Training on Women sub-committee and its functioning	09.05.2019	6	13	19
18	Kanakatte (Seegebagi WUCS)	Training on Disha Ready Study for Entrepreneurship Development	14.05.2019	3	21	24
19	Jambaragatta	Training on Women sub-committee and its functioning	20.05.2019	1	37	38
20	Kerebeeranahalli	Training on Women sub-committee and its functioning	20.05.2019	1	20	21
21	Baballi	Training on Women sub-committee and its functioning	20.05.2019	1	33	34
22	Hale Seegebege	Field day on Sri Paddy and Organic Farming Methods	25.05.2019	94	99	193
23	Baballi	Training on Women Entrepreneurship Development	30.05.2019	0	25	25



S. No	Name of WUCS	Topic of Training	Date	No. of Participants		
				Male	Female	Total
24	Holebairanahalli (Koppa Doddakere WUCS)	World Environment day	05.06.2019	18	75	93
25	SST Office	Progress review meeting and orientation to WUCS and Federation	13.06.2019	20	2	22
26	Holehonnuru	Training on Agriculture Budget Forecasting	15.06.2019	42	18	60
27	Shivamogga	Training on Mushroom Cultivation	20.06.2019	4	67	71
28	IB Bhadravathi	Training on Environmental and Social Safeguard for KNNL, CADA & others	21.06.2019	19	4	23
29	Kagekodamagge	Training on Organic Seed Production, cultivation and marketing with value addition	21.06.2019	38	4	42
30	SST Office	Training on Canal Gate operation for Federation members	22.06.2019	13	0	13
31	Nagatibelagalu Thanda	Training on Women sub-committee and its functioning	27.06.2019	0	12	12
32	Tallikatte	Orientation on availing Bank Loan for Dairy Programme	28.06.2019	3	16	19
33	Jayanagara	Orientation on availing Bank Loan for Dairy Programme	28.06.2019	1	15	16
34	Mysuru and Kirugavalu in Mysuru District	Participation in Organic Seed Mela (Savayava Beeja Mela) and exposure visit to Paddy Conservation Field	29.06.2019	14	2	16
35	Kagekodamagge	Training on Seed Treatment, Germination, Seeds Distribution and planting techniques	12.07.2019	28	2	30
36	KVS Bhavan, Mandya	Participation in Workshop on Environment Friendly Enterprises	12th & 13th July 2019	1	0	1
37	Gondi Dam, RBC, Baranduru Telemetry & other places	Exposure trip to Gondi by women board & sub-committee members	17.07.2019	0	12	12
38	Gondi Dam, RBC, Baranduru Telemetry & other places	Exposure trip to Gondi by women board & sub-committee members	18.07.2019	0	12	12
39	Gondi Dam, RBC, Baranduru Telemetry & other places	Exposure trip to Gondi by women board & sub-committee members	19.07.2019	0	13	13
40	KVK Conference Hall, Navile	Training on Value added product preparation	22.07.2019	2	43	45
41	Inspection Bungalow, Bhadravathi	Interface of Bankers with Dairy Farmers for forward linkages and loan facility	23.07.2019	21	47	68
42	Doddagoppenahalli	Training to Women Directors, "C" and "D" category women members (5 WUCS)	25.07.2019	0	23	23
43	Holehonnuru	Training to Women Directors, "C" and "D" category women members (6 WUCS)	26.07.2019	3	57	60
44	SST Office	Orientation to WUCS & Federation and Progress review meeting	27.07.2019	23	2	25
45	Holehonnuru	O&M - Training on Canal maintenance plan to WUCS	14.08.2019	20	11	31
46	Holehonnuru	Leadership skills for Sustainable agriculture and irrigation management	15.08.2019	0	53	53
47	Kerebeeranahalli (Mudalavitlapura WUCS)	Leadership skills for Sustainable agriculture and irrigation management	16.08.2019	0	24	24
48	SST Office	Orientation to WUCS & Federation and Progress review meeting	20.08.2019	13	1	14
49	Kagekodamagge	Project progress review with WUCS	25.08.2019	72	20	92
50	IB Bhadravathi	O&M - Training on Canal maintenance plan to WUCS	26.08.2019	6	5	11



S. No	Name of WUCS	Topic of Training	Date	No. of Participants		
				Male	Female	Total
51	IB Bhadravathi	O&M - Training on Canal maintenance plan to WUCS	27.08.2019	14	6	20
52	Kagekodamagge	O&M - Training on Canal maintenance plan to WUCS	29.08.2019	26	2	28
53	Bhairumbe, Sirsi & Kalave	Pre-exposure visit to Successful Cooperative Societies in Sirsi	05.09.2019	4	0	4
54	Federation office	Training on Documentation & Photography	07.09.2019	13	5	18
55	Paper Town High School, Bhadravathi	One day awareness program on Prevention of Canal Pollution & Drug abuse for students	09.09.2019	41	59	100
56	Kagekodamagge	Training on Organic way of Pest and Disease Management	17.09.2019	27	3	30
57	Jambaragatta	Training on Tailoring for women	19.09.2019	5	25	30
58	Bhairumbe & Sirsi	Exposure trip by Gondi WUCS to Successful Cooperative Societies	30.09.2019	36	7	43
Total				766	1141	1907

39 Action taken for mitigation of adverse environmental effects by various agencies is provided in **Appendix II**.

2.4 Environmental Monitoring Plan and Implementation

40 The EMP in the PPTA provides a Monitoring Plan to be followed by concerned agencies to ensure that they adhere to the EMP requirements and mitigate adverse environmental impacts arising due to the project. It may be noted that in the current reporting period, construction work could take place only during April-June months; no construction could be taken up after that due to monsoon season. This year, Gondi command witnessed heavy rains often resulting in flood situation in local area. Further, the rains continued even as of the date of this report.

41 The key set of actions carried out by the Contractor as part of the environmental monitoring plan during the period April-September 2019 are as follows:

- i. The Contractor is sourcing stone materials from government approved quarries; the quarry owners are responsible for implementation of the environmental management plan at the quarry sites and reporting to the KPSB. The Consent for Operation of these quarries is within the validity period indicating that its activities are being monitored by the KSPCB, as required. Around 2,83,000 cum of stone aggregate was sourced during the current reporting period. The consent letters for the quarries and batching plant operations at the campsites have been provided in previous SMRs.
- ii. The sites for the borrow pits have been provided by the local Gram Panchayats. Presently, the borrow pits located at Kanasinakatte was utilized to source the soil required for construction activities. Around 16,98,000 cum of soil was extracted from the Kanasinakatte borrow area during this reporting period. Upon extracting the permitted quantity of soil from the borrow area, the Contractor has carried out closure actions to the satisfaction of the land owner.
- iii. The Contractor continued to ensure that the waste management infrastructure at the campsites and construction sites continues to be adequate for both liquid and solid waste management. Additionally, compost pits constructed at the two campsites previously to manage kitchen waste continued to be in operation during



the reporting period. The Contractor has also continued the sanitation and hygiene arrangements at both construction and campsites.

- iv. Construction at site management continued to be satisfactory with the contractor ensuring that there is no negative impact on any of the environmental media either during construction or at the time of construction closure. The Contractor continued to hold local consultations during closure period and securing their approval prior to vacating the site and moving to a new site location. To ensure that the closed campsite has not caused any contamination of the environmental media, i.e., land and water, the Contractor has been instructed to test the quality of the groundwater near the closed construction sites.

42 Actions taken for implementing the environmental monitoring plan are provided in **Appendix III**.

2.5 Social Safeguard Issues

43 The PPTA identifies a couple of social safeguard issues relating to resettlement and indigenous people which the Contractor is addressing effectively. The assessment on the social safeguard implementation is as follows:

- i. System rehabilitation and modernization has not involved any land acquisition or resettlement and rehabilitation. Hence, the Contractor or any other agency has not developed any action plan to deal with the situation arising out of resettlement.
- ii. System rehabilitation and modernization has not negatively impacted the indigenous population. Hence, both the Contractor and other agencies have not developed any action plan to deal with the situation arising out of resettlement.
- iii. The Contractor held periodic health check-up for workers/ labourers, and his staff and their family members utilising the services of a local medical doctor. Considering that the majority of the workers are migrant workers, PSC advised the Contractor on the importance of conducting awareness workshops for workers on issues such as Health, safety, occupational hazards, communicable diseases, HIV/AIDS by availing services of local specialists.
- iv. Accordingly, PSC conducted Health, safety and HIV/AIDS training programme on 29.9.2018 jointly with the Contractor. During the reporting period two check-ups and workshops conducted. The details of sex-disaggregated data on health monitoring performed by the Contractor was provided in the previous SMR.

44. Actions taken on the implementation of Social Safeguards is provided in **Appendix IV and V**.



3. CONCLUSIONS

- 44 This is the seventh half yearly report on environmental and social safeguards compliance of the Modernization of Gondi Irrigation System in Bhadravathi Taluk, Shimoga District, Karnataka Project for the period April-September 2019.
- 45 In addition to the work carried out by the Contractor, WUCS carried out CAD works in their respective command areas. A total of 243 contracts have been awarded to the WUCS to carryout CAD works as community participation packages for construction of field irrigation channels, installation of flow control gates, WUCS buildings and Gondi anicut protection works .
- 46 Upon selection as the Contractor, RPP has submitted an EMP and followed it up with a CEMP that outlined the plan to be implemented by the Contractor. During the reporting period, RPP has ensured that labourers and workers campsites have access to water supply and sanitation services, and firewood and LPG cylinders for cooking purposes. However, both the EMP and CEMP submitted by the Contractor did not initially provide an action plan to address the various environmental and social issues which have been identified in the PPTA.
- 47 However, PSC has had discussions with Contractor's representatives on these issues and the first Safeguard Monitoring Report provided guidelines on the kind of activities that the Contractor needs to carryout to comply with the loan covenants and compliance by Contractor with the proposed mitigation measures as described in the Environmental Management Plan (EMP) and contract specifications.
- 48 The Contractor has obtained a Workers Compensation Insurance to cover 25 workers at any point of time valid until May 2020. It has been instructed to ensure renewal before he begins work again during May closure period.
- 49 The Contractor has incorporated the suggested plan of action for complying with the proposed mitigation measures as described in the EMP and the Contract Specifications.
- 50 During the current reporting period, the Contractor has implemented a number of mitigation measures to comply with the EMP. These include the following:
 - i. PSC instructed the Contractor to renew labour insurance which lapsed in December 2018 which has been done, now valid till March 2020.
 - ii. The contractor provided basic infrastructure to all workers and labourers including shelter, drinking water supply, sanitation and cooking area;
 - iii. The contractor organized Medical Camps to employees and their families, ensured health and well-being of the entire workforce;
 - iv. The contractor provided the construction workers and labourers with all safety equipment for use during construction;
 - v. The contractor provided appropriate signboards at the batching plant site, construction locations and in the nearby community in regard to the construction activity and the precautions to be taken by the workers, labourers and the community during the construction period;



- vi. The contractor obtained permission from farmers for disposing the silt on their farm lands as and when required;
 - vii. The contractor is taking all precautions to ensure environmental integrity of air, water and land during the construction period. No untoward incidents have been reported, thus far.
 - viii. The contractor has conducted periodic consultations with the local community to ensure that activities carried out during the construction period have not harmed the environmental integrity of the construction site or the nearby community.
 - ix. The Contractor closed the construction camp site and the operation of a batching plant at Timlapura Site as explained in paragraph 2.2(ii).
 - x. The contractor has maintained a record of all environmental related activities;
 - xi. The contractor has maintained O&M record of all sanitation related activities carried out at the campsites;
 - xii. The contractor has implemented a Dananayakapura borrow pit closure activities to the satisfaction of the local community, and
 - xiii. The contractor addressed the social safeguard issues effectively.
- 51 In areas where there is shortfall, the Contractor has been instructed to initiate mitigation measures during the subsequent months. These are described below:
- i. Contractor has been instructed to periodically monitor the quality of air, water, noise and land at the construction sites and campsites for baseline, during construction period and post-construction period. Presently, the Contractor has been instructed to test the groundwater quality near the closed construction campsite at Timlapura Site to ensure that the environmental media is not impacted by the construction camp activities;
 - ii. Contractor has been instructed to continue to hold regular workshops on Occupational Health and Safety Issues for Workers, Labourers and in some instances the local community, as well and ensure its implementation;
 - iii. Contractor has been instructed to continue to obtain information from all material suppliers regarding implementation of the EMP at their sites;
 - iv. Contractor has been instructed to increase the number, location and spread of safety sign boards especially in construction areas/ campsites that are close to habitation areas;
 - v. Contractor has been instructed to continue maintaining all necessary documentation in compliance with the EMP;
 - vi. Contractor has been instructed to prepare a closure plan for all burrow pits and obtain permission from the local authorities for its implementation;
 - vii. Contractor has been instructed to continue taking the local community and farmers into confidence for the construction schedule to be adopted, disposal of silt and other waste materials and obtain their approvals at the time of completion of construction activity at a particular location.



- 52 All the above measures would go a long way in ensuring effective implementation of the EMP.
- 53 The next Safeguard Monitoring Report is due for the period October 2019-March 2020. It shall be presented in the month of March 2020, subject to extension of project beyond 31 December 2019.



APPENDIX I

Contractor's Performance in EMP Implementation as of September 2019

Environmental Issue identified in the PPTA	Observation and Status	Remarks for future
Water Logging or Aquifer degradation due to project activities	<p>Incidences of water logging due to the project activities have not been observed. at any of the construction sites. Neither, have any of the local residents reported water logging near the construction sites.</p> <p>The Contractor has analysed groundwater samples during the reporting period. And found that the ground water quality is in premised limits. Near the campsites and the analysis report is enclosed – indicates that No aquifer degradation has taken place due the project activities.</p> <p>Sanitation facilities at both campsites and construction sites are adequate and have been put to use. After the closure of the Timlapura Site, the sanitation facilities at the Site has been retained by the Contractor at the behest of the land owner. Now, the Timlapura Site sanitation facilities are being maintained by the land-owner</p> <p>As there is no construction activity soil contamination with oil incidents were not encountered during the present reporting period.</p>	<p>The Contractor has to continue to maintain the log book on water logging incidences including photographs.</p> <p>The Contractor has to continue with analysis of samples of groundwater collected from the borewells near the campsites and construction sites and record the results.</p> <p>The Contractor has been instructed to ensure that the labourers/ workers continue to use these facilities and the facilities maintained in an exemplary manner. This is being done.</p> <p>The Contractor has to continue to maintain the O&M Record of the sanitation facilities provided at both campsites and construction sites.</p>
Cutting of Trees	<p>Based on the survey conducted by the contractor it is found that 234 trees have to be cut along the construction pathway. In order to compensate the cutting of 234 trees the contractor has planted 240 coconut trees</p> <p>At Holehonnur construction site, Contractor has replanted the Bilva tree at temple.</p> <p>The Contractor has paid compensation to the farmer for the arecanut trees removed in spite of the fact that the trees were on encroached property.</p>	<p>After the Holehonnur incident, the Contractor has followed PSC instructions to consult the local community prior to taking a decision on tree cutting and a record be maintained on such decisions.</p> <p>The Contractor has to start compensatory afforestation in consultation with Karnataka Forest Department once the construction activities resume.</p>
Reduction in habitat for local flora and fauna	<p>In order to minimise human-animal conflict by identifying possible animal corridors and taking up appropriate mitigation actions. the Contractor has worked with the Forest Department and it is found that No animal corridor exists in the construction area.</p>	<p>The Contractor has to record the decision and share it with KNNL.</p>
Damage to Infrastructure	<p>Implement a plan of action to ensure that all infrastructures are maintained in their original state - Upon receiving instructions from the PSC, the</p>	<p>The Contractor has to continue keeping record of baseline and closure information on the condition of all land and other infrastructure at</p>



Environmental Issue identified in the PPTA	Observation and Status	Remarks for future
	<p>Contractor has developed a photo-record of the baseline conditions of the site and supplementing it with photographs taken after closure.</p> <p>Minor repairs have been carried out by the Contractor to cover certain structures near the construction sites. These minor repairs were not part of the original scope of work of the Contractor.</p> <p>No infrastructure damage has been noticed at the closed construction sites.</p>	<p>each of the construction related sites. A record of such decision making should be maintained.</p>
Workers/ Labour Camps and facilities	<p>The Contractor has secured a Workers' Compensation Insurance to cover over 25 workers which is valid until May 2020.</p> <p>The Contractor is required to implement a plan of action for ensuring good living conditions for the workers / labourers working at the project site.</p> <p>The Contractor has provided adequate water and sanitation facilities at the Workers / Labour Camps. Additionally, the Contractor has provided fire-wood for cooking purposes to the workers' families so as to avoid the cutting of the trees near to the labourer's camps. At the Workers' Camp, LPG cylinders are provided for cooking purposes.</p>	<p>The Contractor has to renew the Workers' Compensation Insurance to cover all the workers until the end of the extended contract period.</p> <p>The Contractor has to continue source separation and compost the kitchen wastes.</p> <p>The Contractor has to update the record of all the facilities provided.</p> <p>The Contractor is continuing periodic health camps for the benefit of the workers and their family members. A record is being maintained about such camps.</p>
Conflict with labour camp for resources	<p>The Contractor is required to take all possible measures to avoid conflict between migrant labour and local population.</p> <p>It is a positive sign that the Contractor has distributed fire wood to the labourers for cooking purposes which would help prevent conflict with the local population for resources.</p> <p>No conflict for available resources has been reported near the labour / workers' camps.</p>	<p>The Contractor has been conducting awareness workshops for migrant labourers.</p> <p>The Contractor is maintaining a record of all initiatives and incidents of conflict between migrant labour and local population and use all resources to resolve such conflicts.</p> <p>The Contractor has to continue taking pro-active measures to prevent any conflict.</p>
Chance finding of archaeological sites	<p>The Contractor is required to implement a plan of action for dealing with situation arising out of chance finding of archaeological sites.</p> <p>No archaeological sites have been found in the construction area.</p>	<p>The Contractor has to continue maintaining a record of archaeological site findings and interact with the District Collectorate on the action to be taken for any such findings.</p>
Pollution from Construction activities	<p>The Contractor is required to implement a plan of action to reduce pollution from construction activities.</p>	<p>The Contractor has to maintain records of baseline, during construction and post-construction periods.</p>



Environmental Issue identified in the PPTA	Observation and Status	Remarks for future
	<p>As of now, the Contractor has provided adequate sanitation facilities at the Labour/ Workers Campsites.</p> <p>No pollution has been reported from the construction activities at/ near the construction sites.</p> <p>The Contractor is watering the campsites as well as village roads to prevent dust in the surroundings.</p> <p>The Contractor has installed composting pits for composting kitchen wastes at both the camp sites.</p>	<p>The Contractor has to analyse groundwater samples to ensure quality is not affected near the Workers/ Labourers' Campsites due to use of soak pits/ septic tanks for sewage disposal.</p> <p>The Contractor has to continue with source segregation of wastes at the campsites;</p> <p>The Contractor has to install compost unit to manage the kitchen wastes at the campsites.</p> <p>The Contractor has to continue maintaining record of the O&M activities of all pollution control equipment's/ processes.</p>
<p>Accidents and Health concerns of local population</p>	<p>The Contractor is required to implement a plan of action to eliminate accidents and address health concerns of local population arising from construction activities including migrant labour.</p> <p>The Contractor has installed sign boards warning the local residents about the movement of trucks along the village roads during the transport of concrete-mix to the construction sites.</p> <p>No other accident or health related concern attributable to the project has been reported in the construction areas or among the construction workers/ labourers.</p>	<p>The Contractor has to continue holding regular sensitization workshops for prevention of construction-related accidents.</p> <p>The Contractor has to continue keeping a record of all initiatives taken to prevent accidents and health concerns of local population.</p>
<p>Compaction of soil/ soil erosion for access to various sites and quarries such as metal quarries for aggregate, murrum quarries and sand mining areas</p>	<p>The Contractor is required to work with quarry owners in restoring the construction/ quarry sites after work completion.</p> <p>As of now, the Contractor is procuring construction materials only from legally approved quarries.</p>	<p>Contractor was instructed to implement a Construction/ Quarry Site Restoration Plan and keep a record of the initiatives taken.</p> <p>Contractor has been instructed to procure details of the consents issued by the KSPCB.</p>
<p>Impact on local fisheries and fish spawning and aquatic fauna</p>	<p>The Contractor is required to schedule construction activity in such a way that adverse impact on local fisheries and fish spawning is minimized.</p> <p>There is no reported adverse impact of construction activities on local fisheries and fish spawning.</p>	<p>The Contractor has to continue being proactive in identifying construction areas utilised for local fisheries activities and take preventive actions in discussions with Fisheries Department</p>
<p>Disturbance to local population</p>	<p>Construction activity to be scheduled such that there is minimum disturbance to local population.</p>	<p>The Contractor has been instructed to continue to be sensitive to the needs of the local population and schedule</p>



Environmental Issue identified in the PPTA	Observation and Status	Remarks for future
	<p>There is no reported occurrence of disturbance to local population caused by the construction schedule.</p> <p>The Contractor is holding local consultations at closure stages to ensure that the local community is satisfied with the restoration of the construction site to original condition after completion of construction.</p>	<p>construction activities so as to minimize any disturbance.</p> <p>The Contractor has to keep a record of any changes that have been incorporated in the construction schedule and/ or construction activities to address requirements of local population</p>
<p>Reduced access to sites for local population, construction sites or material procurement sites.</p>	<p>The Contractor is required to schedule construction activity and movement of vehicles such that there is minimum disturbance to the movement of local population.</p> <p>Local population have not lodged any complaint on reduced access to their lands/ public places because of the construction activities.</p> <p>Local population have appreciated the Contractor's effort in installing sign boards warning about the movement of material-trucks within the village area.</p>	<p>The Contractor has continued to hold sensitization workshops for the local residents on construction activities near the habitations and instruct on the health and safety issues surrounding such activities.</p> <p>The Contractor has been instructed to continue to be sensitive to the local population access needs.</p> <p>The Contractor has been instructed to continue to maintain record of initiatives taken to maintain access.</p>
<p>Sand Mining and possible change in river course and river scouring</p>	<p>Contractor to ensure that excess sand mining is not resorted to and should rehabilitate sand mining area after work is completed.</p> <p>Presently, no river sand is being used by the Contractor for construction activities. In fact, the Contractor is procuring manufactured-sand (M-Sand) from sub-contractors.</p>	<p>The Contractor has been instructed to keep a record on Sand Procurement including source and the environmental management plan followed by the vendors. However, since M-sand is used the source is being recorded.</p>
<p>Water logging from poor site planning and management</p>	<p>Contractor to implement proper site planning and management to prevent water logging.</p> <p>No water logging incidents have been reported in any of the construction sites, thus far.</p>	<p>The Contractor has been instructed to continue proactive measures to prevent water logging at construction sites.</p> <p>The Contractor is also instructed to keep a record of initiatives taken to prevent water-logging.</p>
<p>Erosion due to sand and murrum mining and material procurement methods</p>	<p>Contractor to implement a plan of action to prevent erosion.</p> <p>Material procurement is through sub-contractors hired by the Contractor and information on erosion is being sought from the Sub-Contractor.</p>	<p>The Contractor has been instructed to keep records of the consents issued by the KSPCB to the material suppliers and check the validity of the same.</p>
<p>Disturbance to wild life species due to construction and material procurement activities.</p>	<p>Contractor to schedule activities and prevent disturbance to wild life activities</p> <p>No disturbance to wild life has been reported because of either construction activities or material procurement.</p>	<p>The Contractor has been instructed to keep records of disturbance to wildlife reported during either construction activities or material procurement.</p>



Environmental Issue identified in the PPTA	Observation and Status	Remarks for future
Occupational safety and health hazards	<p>Contractor to take up adequate measure to ensure occupational safety and prevent health hazards.</p> <p>One snake-bite incident was reported in one of the construction sites in Dec. 2016. The Contractor incurred all the necessary medical expenses to cure the victim. The victim has since then reported back to work.</p> <p>No other incidences of workers'/ labourers' health and safety has been reported this quarter.</p>	<p>The Contractor has a Workers' Compensation Insurance that covers 50 workers at any point of time which was valid until December 2018. Now, the Contractor has been instructed to extend insurance cover to all the workers until the end of the extended contract period.</p> <p>The Contractor has kept a record of the use of PPE at the construction sites.</p> <p>The Contractor has been instructed to be pro-active on occupational safety and health hazards.</p> <p>The Contractor has also been instructed to keep a record of any such incidences.</p>



APPENDIX II

Assessment of the Role of Other Institutions in EMP Implementation

Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
Reduced environmental flows due to increased efficiency	Overall assessment of appropriate water needs for each sector, including environmental flows.	ACIWRM and River Basin Plans.	ACIWRM is developing the State IWRM Policy and Strategy using a participatory approach that would address the needs of each sector including aspects on environment and climate change.
Water Logging or Aquifer degradation due to project activities	Development of appropriate drainage structures and management measures, on-farm land management; Work with farmers to identify appropriate cropping patterns and agri-chemical usage given existing soils and drainage conditions Identify and manage quarries such that they cause minimum damage, if any to surface and groundwater systems and ensure that during quarrying there is minimum, if any, damage to aquifers and surface water systems.	PMU Command Area Development Authority (CADA) and Institutions Cells, WUCS and Agricultural Extension Sub-Project.	CADA has developed designs for field channels that have been constructed by the WUCS; Capacity building on appropriate cropping patterns and agri-chemical has been carried out for the WUCS members by the PSC. It is ensured that the Contractor procures the materials from Government-approved quarries that have the necessary consents from the KSPCB.
Water quality degradation due to existing agricultural activities– agrichemicals and land management practices	Education to farmers in improved agricultural practices and use of agri-chemicals, on-farm land management practices.	PMU CAD and Institutions Cells, WUCS and Agricultural Extension Sub-Project	Capacity building on improved agricultural practices and use of agri-chemicals have been carried out for the WUCS members by the PSC SST and in some cases using the services of outside experts, as well.
Increased soil-toxicity, reduction in soil quality, soil exhaustion and erosion	Education to farmers in improved agricultural practices and use of agri-chemicals, on-farm land management practices.	PMU CAD and Institutions Cells, WUCS and Agricultural Extension Sub-Project	Capacity building on improved agricultural practices and use of organic manures and other on-farm land management practices has been carried out by the PSC SST for the WUCS members.
Lowering groundwater table	Identify appropriate groundwater management and conjunctive use plans and local level regulation	ACIWRM 's IWRM Plans, PMU CAD and	ACIWRM has been selected as the nodal agency for the "National Groundwater Management Programme"



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
	systems based upon local aquifer needs.	Institutions cells	in Karnataka and is preparing a detailed project proposal for the state.
Cutting of Trees	<p>Ensure design reduces need to cut trees; For all trees cut/ removed, plantation should be in the ratio of 3 planted for every one cut. All plantation activities should consist of appropriate species for the area to be planted, in consultation with the Forest Department and also after understanding the local ecological needs. Include in project budget. Need to include in the construction contractor's contract.</p> <p>Ensure required permission is taken from Tree Officer as identified in the Karnataka Preservation of Trees Act, 1976 prior to any tree cutting activity.</p>	PMU CAD and Institutions Cells	<p>The Contractor has initiated Compensatory Afforestation for the 234 trees that have been removed as part of the project. Contractor has to plant about 1000 trees as a part of afforestation activity and has completed planting 225 trees as of this reporting.</p> <p>WUCS have conducted tree-planting campaigns in their respective regions and using the support of schools and other community organizations to carry out the work.</p>
Reduction in habitat for local flora and fauna	<p>Ensure all plantation activities are based upon the local fauna and flora needs, with no invasive species planted;</p> <p>Identify possible animal corridors and identify possible actions to reduce conflict - such as scheduling work in any corridors to minimise conflict;</p> <p>Ensure alien species or those inappropriate to the area are not planted in any animal corridor or fly path area;</p> <p>Identify appropriate local species for any firewood plantations;</p> <p>All construction activities should be included in the construction contractor's clauses.</p>	PMU CAD and Institutions Cells	<p>WUCS have carried out a tree-planting campaign during the monsoon involving schools, local leaders and local population and other community organizations. 598 saplings have been planted by PSC through greening programme on various days in the premises of Schools and other public places.</p> <p>No animal corridor or fly path area has been identified in the project area.</p>
Human-Animal Conflict	Where possible identify appropriate cropping	PMU CAD and	The compensatory afforestation activities



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
	<p>pattern, considering possible animal raid issues. Discuss with Forest Department;</p> <p>Avoid any activity in animal corridors during migratory season and do not create any permanent structure to obstruct it.</p>	<p>Institutions Cells</p>	<p>including species selection were carried out in consultation with the Karnataka Forest Department.</p> <p>No animal corridor or fly path area have been identified in the project area;</p>
<p>Reduced fodder and grazing lands</p>	<p>Identify areas which are specifically for grazing in the area and through community management ensure that they are not encroached upon or overgrazed;</p> <p>Identify appropriate agencies, such as the Animal Husbandry Department to help with improving fodder availability and reduction in open grazing;</p> <p>Implementation of locally identified issues through guidance from PMU</p>	<p>PMU CAD and Institutions Cells, and ACIWRM 's IWRM Plans</p>	<p>Participative Land and Water Management Plans is being developed by ACIWRM. The progress and contents of these plans shall be provided in the next SMR.</p>
<p>Chance finding of an archaeologically or culturally important site</p>	<p>The EMP should include in the event such sites are encountered, all work that may be underway or planned in the area should be stopped and discussed with the District Commissioner before further action.</p> <p>Ensure that the construction company and the supervising consultants have an understanding of the archaeological concerns of the area.</p> <p>Ensure that any important archaeological area is well identified and demarcated and that required actions are specified in a detailed management and mitigation plan so that no damage takes place to it.</p>	<p>PMU Institutions Cell</p>	<p>No archaeological or culturally important site has been found during the construction activities.</p>
<p>Reduced aesthetics due to quarries on river bed, hills etc.</p>	<p>Rehabilitation of all sites must be undertaken once work is completed and plans developed well in</p>	<p>PMU Irrigation and Institutions Cells.</p>	<p>It is ensured that the Contractor procures the materials from Government-approved quarries that have</p>



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
	<p>advance of construction activities. Include rehabilitation requirements in the construction company contract to ensure it is taken up and appropriate budget should be made for the activity.</p> <p>Avoid any quarrying work in an aesthetically important /significant place.</p> <p>During design phase, once sites are identified, ensure budget to rehabilitate sites are allocated and remediation actions included in EMP.</p> <p>All construction related activities should be included in the construction contractor's contract as clauses, including material procurement.</p>		<p>the necessary consents from the KSPCB.</p> <p>M-Sand has been used by the Contractor to avoid river sand and thereby mining of sand from the rivers.</p>
Loss of local agri-biodiversity	<p>Identify methods of preserving and cultivating local agricultural species and cultivators;</p> <p>Work towards breed improvement of local agricultural species and possible methods to improve income from the sale of produce of local agri-biodiversity</p>	PMU Irrigation and Institutions Cells.	Capacity building activities have been conducted by the PSC SST team for the benefit of WUCS members through utilisation of outside experts in regard to understanding the impacts of maintaining agri-biodiversity.
Conflict with local fisheries	<p>Do not undertake any construction/quarrying activities in areas where local fish populations are important. In case unavoidable, identify methods to reduce impact after discussion with local population and also consider ways to compensate for loss;</p> <p>Consider and include fish passages at Anicuts.</p>	PMU Institutions Cell	No construction activity has been carried out in a way so as to affect the fish population in the region.
Reduced access to water for domestic, livestock and other purposes from canal system due to design	Identify water needs for different users and in consultation with them develop appropriate design changes to ensure access	PMU Institutions Cell	ACIWRM is conducting basin-wise training on the use of FAO MASSCOTE system for planning a modernization of irrigation



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
changes and increased water use efficiencies	to identified groups at required places.		systems including aspects on improving water use efficiency and productivity.
Disruption of traffic routes due to siting of infrastructure	Identify any landing and other sites along the planned infrastructure site. Where possible consider design changes to ensure there are no problems faced by the local population; Where not possible in consultation with the local population create alternate facilities.	PMU CAD and Institutions Cell	No disruption was caused to the local population while carrying out the construction activities.
Increase in agricultural waste such as agrichemical waste	Undertake farm management education for farmers to ensure that they know how to dispose agrichemical waste in most appropriate way; Explore with KVKs, Agriculture Department, local agri-chemical shops and agri-chemical companies on the possibilities of a buy-back system for agrichemical containers etc.	PMU CAD and Institutions Cell, WUCS and Agricultural Extension Sub-Project	Capacity building activities have been organised by the PSC SST team for the benefit of WUCS members through utilisation of outside experts in regard to understanding the utilisation of agricultural waste.
Increased vector habitats and diseases	Ensure adequate drainage needs are identified, designed and their maintenance is also identified; If required, develop extra drainage plans for various structures to ensure there is no waterlogging	PMU CAD and Institutions Cell	CADA has developed designs for field channels that have been constructed by the WUCS.
Reduction in food supplements – fish and wild berries	Identify any use of lands where structure is lined, or fishing areas and consider how best to take into account people's needs; Through an IWRM approach identify various needs of lands not presently occupied by agriculture and ensure that these uses are accounted for any land use and management plan developed for the area.	PMU Institutions Cell	No disruption was caused to the local population while carrying out the design and construction activities.



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
Increase in agri-industrial wastes from local factories	Review waste management processes and prepare better plans as required	PMU Institutions Cell and State Pollution Control Board.	Capacity building activities have been conducted by PSC involving external experts in regard to understanding the utilisation of agricultural waste.
PROJECT OPERATION			
Increased agricultural waste in water and water bodies	Ensure through farmer's education that waste is not disposed in water bodies and appropriate waste disposal systems are found and used.	PSC Environmental Specialist with WUCS Service Support Teams	Capacity building activities for the WUCS members have been carried out as part of WUCS strengthening. Farmers are taking better care of the canals, as described in the QPRs.
Increased agrichemicals in surface and ground water systems, and reduced quality of return flows	Farmers education on proper use and management of agrichemicals, including their waste. Ensuring a farmer-friendly method for disposal of agricultural waste, as identified during project design.	PSC Environmental Specialist with WUCS Service Support Teams	Details of capacity building activities carried out during March-April 2019 for WUCS members by the PSC are provided in this report.
Waterlogging and reduced drainage	Identify appropriate cleaning and maintenance of drainage system, including disposal of waste removed. Improved agriculture practices– understanding plant needs and use of irrigation water as required through improved understanding of the system; Identify appropriate systems for the management of drains and disposal of silt. Ensure there is a budget for the management of drains and the budget is spent on it	PMU CAD and Institutions Cell	Capacity building activities for the WUCS members were conducted during April-June 2019 by relevant experts on the issue. The details are provided in the report.
Soil degradation due to poor on-farm management, intensive agriculture, soil exhaustion and soil toxicity due to chemical usage and	Identify appropriate soil management and soil testing systems and educate farmers on it. Ensure that farmers remember through repeated information sharing on good agriculture	PMU CAD and Institutions Cell	Capacity building activities for the WUCS members have been conducted as part of WUCS strengthening. Several WUCS have begun organic farming practices past year. Linkages with University of Agriculture and



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
lack of knowledge among farmers.	and soil management practices.		KVK have been established. QPR provides details.
Change and degradation of wetlands due to waste dumping and expansion of agricultural lands	Identify important wetlands and identify land use and condition. Through the IWRM activities identify appropriate land management and conservation methods, and work with farmers to educate and ensure that wetlands are not degraded. Work with farmers to identify appropriate land management and waste management systems at the village level.	PMU Cells, SST and PSC	Capacity building activities for the WUCS members has been conducted during Jan – March 2019 by the relevant experts on this issue. The details are provided in this report.
Reduced and degradation of habitats for species – both aquatic and terrestrial species	Work through a community system to identify wetlands, other habitats and local environmental assets. Work with local community to ensure that cultivation is not extended into areas environmental assets. Demarcate all areas though an IWRM plan for conservation and limitation of areas for agriculture.	PMU Institutions Cell and ACIWRM 's IWRM Plans	Educate community on management of soil and agri-chemical usage.
Increased aquatic weeds	Ensure appropriate drainage management to keep the canals and drains silt free and not allowing the disposal of any waste. Work with farmers through farmer's education system to ensure appropriate application of agri-chemicals, including fertilizers. Educate farmers on proper soil management and testing.	PMU Irrigation and Institutions Cell	Capacity building activities for the WUCS members have been carried out during reporting period. WUCS have started dweeding of canals during past six months.
O&M waste – spoils from drainage system and canals	Identify appropriate waste management system for drain cleaning. Weeds can be used, in consultation with farmers, for manure. Therefore, if farmers are interested a	PMU Irrigation and Institutions Cell	Awareness programmes have been held.



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
	system for their use and disposal on farmlands at the time that drains are cleaned should be undertaken.		
Increased toxicity in environment and for people with more agri-chemical packages being reused	Farmer education on appropriate management of agri-chemical packaging. Where possible consider a buy-back system for agri-chemical packages by the agri-chemical companies.	PMU Institutions Cell	Several training programmes on soil toxicity have been held as part of WUCS Strengthening. Farmers are appreciative of the adverse effects of chemical fertilizers, pesticides and insecticides. Indiscriminate disposal of packaging is reduced.
Non-point source pollution of waterways	Work with and educate farmers on the best management of agri-chemicals. Consider options for improving quality of NPS runoff.	PMU Institutions and CAD Cell, ACIWRM Studies	Covered as part of training programmes. 3 WUCS disposing sewage water into canal are now following up with local municipal authorities and KSPCB. These urban areas of the WUCS are now planned for Underground Drainage as part of municipal plans.
Multi-objective use of tanks and off line storages	Consult with users, study existing and planned uses and consider options for best management of the tank areas recognising their multiple uses	PMU Institutions Cell, ACIWRM's IWRM Plans	ACIWRM is developing Participative Land and Water Management Plans and State-specific Action Plan for combating Climate Change. The details of these studies shall be provided in the report.
Increase waste from fields due to micro-irrigation system	Educate farmers on best management of systems to be used, where to get good quality material that does not break down and spoil fast, its maintenance and proper disposal of waste	PMU Irrigation and Institutions Cells, WUCS and agricultural extension sub-project	Being covered in various Capacity building programmes to raise awareness among WUCS.



APPENDIX III

Assessment of the Role of ACIWRM in EMP Implementation as of 30 September 2019

Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
Reduced environmental flows due to increased efficiency	Overall assessment of appropriate water needs for each sector, including environmental flows.	ACIWRM and River Basin Plans.	ACIWRM has developed the State IWRM Policy and Strategy using a participatory approach that would address the needs of each sector including aspects on environmental flows. The revised State Water Policy has been submitted to the State Government in May 2017 and is awaiting clearance from the Cabinet.
Lowering groundwater table	Identify appropriate groundwater management and conjunctive use plans and local level regulation systems based upon local aquifer needs.	ACIWRM 's IWRM Plans, PMU CAD and Institutions cells	ACIWRM has been selected as the nodal agency for the "National Groundwater Management Programme" in Karnataka and has prepared a detailed project proposal for certain areas of the state and the proposal has been submitted to the Expenditure Finance Committee of the Government of India. While the GOI has approved the program the implementation is yet to start. The program covers the water-stressed areas of the state.
Reduced fodder and grazing lands	Identify areas which are specifically for grazing in the area and through community management ensure that they are not encroached upon or overgrazed; Identify appropriate agencies, such as the Animal Husbandry Department to help with improving fodder availability and reduction in open grazing; Implementation of locally identified issues	PMU CAD and Institutions Cells, and ACIWRM 's IWRM Plans	Participative Land and Water Management Plans is being developed by ACIWRM. These plans focus on improving water-use efficiency and water productivity. Upon finalization of the plans, these plans are expected to be implemented in the Tungabhadra Basin under Tranche 2 and 3 funding.



Environmental Issue identified in the PPTA	Mitigation Action for implementation	Responsible Institution	Action List
	through guidance from PMU		
PROJECT OPERATION			
Reduced and degradation of habitats for species – both aquatic and terrestrial species	Work through a community system to identify wetlands, other habitats and local environmental assets. Work with local community to ensure that cultivation is not extended into areas environmental assets. Educate community on management of soil and agri-chemical usage. Demarcate all areas through an IWRM plan for conservation and limitation of areas for agriculture.	PMU Institutions Cell and ACIWRM 's IWRM Plans	ACIWRM has developed the State IWRM Policy and Strategy using a participatory approach that would address the needs of each sector including aspects on preventing reduction and degradation of habitats for both aquatic and terrestrial species. The revised State Water Policy has been submitted to the State Government in May 2017 and is awaiting clearance from the Cabinet.
Non-point source pollution of waterways	Work with and educate farmers on the best management of agri-chemicals. Consider options for improving quality of NPS runoff.	PMU Institutions and CAD Cell, ACIWRM Studies	Participative Land and Water Management Plans is being developed by ACIWRM. These plans focus on improving management and use of agri-chemicals. Upon finalization of the plans, these plans are expected to be implemented in the Tungabhadra Basin under Tranche 2 and 3 funding.
Multi-objective use of tanks and off line storages	Consult with users, study existing and planned uses and consider options for best management of the tank areas recognising their multiple uses	PMU Institutions Cell, ACIWRM 's IWRM Plans	ACIWRM is conducting climate change related studies in association with Indian Institute of Science and Visvesvaraya Technological University. The results and these studies and the IWRM Policy developed shall be used to finalize options for best management of tank areas and off-line storages.



APPENDIX IV

Implementation of Environmental Monitoring Plan

Parameter	Monitoring Frequency	Action	Responsible Authority	Action taken during Reporting Period
PROJECT CONSTRUCTION				
Noise	Baseline and Monthly during construction	Establish pre-construction baseline; Identify habitations close to construction site or wild life area, if any.	Construction Contractor	Noise monitoring is not done as the construction sites are in rural areas with very low-density habitation areas and away from wild life area
Site for Quarries and borrow pits	Baseline and Final Check after construction is complete	Photographic baseline for restoration of site and final check after construction and restoration is complete.	Construction Contractor	Quarries are beyond the scope of the Contractor. It is ensured that the Contractor sources materials from approved quarries as these quarries are being monitored by KSPCB.
Removal of vegetative cover and trees	Baseline and Final Check prior to final payment	Vegetative and Tree Survey to be conducted; Replantation Plan to be developed and implemented.	Construction Contractor in consultation with PMU and Forest Department.	As part of Compensatory Afforestation, WUCS have carried out a tree-planting campaign in all their areas; specific plantation in all WUCS taken up during the ensuing monsoon period.
Waste Management at sites	Random at sites but report compiled monthly at sites	Develop and implement waste management plan at sites	Construction Contractor	Liquid and Kitchen waste management has been put in place at both the labourers' and workers' campsites. The Contractor has complied effective maintenance of the same so that all facilities are in usable condition during the project / construction period.
Site Management	Monthly for duration of work	To ensure all required facilities are available at campsites and construction sites including those related to health and safety of labourers, workers and local community who are impacted by construction activity	Construction Contractor	The Contractor has provided water and sanitation facilities at the labourers' and workers' campsites. Also, the labourers are provided with firewood for cooking purposes so as to avoid conflict with local community on the use of local firewood resources.
Site Restoration	Baseline and Final Check prior to final payment	Develop and implement site restoration plan.	Construction Contractor	A register is being maintained to record pre- and post-restoration status; approval of the



Parameter	Monitoring Frequency	Action	Responsible Authority	Action taken during Reporting Period
				<p>local community is taken prior to moving the workers to another site location post restoration.</p> <p>Timlapura camp site has been closed; The Contractor conducted groundwater analysis to ensure that the construction camp site has not led to contamination of the environmental media. The results of groundwater monitoring are enclosed in the Report.</p>
PROJECT OPERATION				
IPMN Implementation	Bi-Annual	Review progress of knowledge and use of IPMN by farmers and access to required facilities.	PMU CAD and Institutional Cells, WUCS and Extension Workers.	This activity shall be taken up after the construction is completed and operation of the modernized system commences
Water Quality	Annually	Baseline and later annually for a 5-year period.	PMU CAD and Institutional Cells, WUCS and Extension Workers.	This activity shall be taken up after the construction is completed and operation of the modernized system commences



APPENDIX V

Assessment of Social Safeguard Implementation by the Contractor

Social Safeguard issues identified in the PPTA	Observation and Status	Remarks
Resettlement	The system rehabilitation and modernization is unlikely to involve any need for land acquisition or resettlement and rehabilitation. In the rare event that this is needed, the Contractor has been instructed to inform KNNL and decision taken in consultation with the authorities.	No resettlement issues emerged during the project.
Indigenous Population	The system rehabilitation and modernization is unlikely to negatively impact the indigenous population. In the rare event that an impact is noticed, the Contractor has been instructed to inform KNNL and decision taken in consultation with the authorities.	No indigenous people's issues emerged during the project.
Health and HIV/AIDS	<p>The Contractor has been instructed to periodically conduct awareness workshops on HIV/AIDS using the services of a Local Medical Officer who shall explain the risk of sexually transmitted diseases on periodic basis.</p> <p>The Contractor has been instructed to conduct regular health check-up of its labourers and workers to ensure their general health condition.</p> <p>The Contractor has been instructed to periodically conduct awareness workshops on Human Trafficking issues so as to ensure safety of the labourers and workers families.</p>	The Contractor has been carrying out health check-up of the workers on a periodic basis and keeping a record of such monitoring activities.



APPENDIX VI

Assessment of Social Safeguard Implementation by Other Agencies

Social Safeguard issues identified in the PPTA	Observation and Status	Remarks
Resettlement	The system rehabilitation and modernization is unlikely to involve any need for land acquisition or resettlement and rehabilitation. However, KNNL has to ensure that the R&R issues, if any are addressed prior to handing over the site to the Contractor.	No resettlement issues emerged during the project.
Indigenous Population	The system rehabilitation and modernization is unlikely to negatively impact the indigenous population. However, KNNL, PMU and CADA has to ensure that during construction and operation of the system, the interests of the indigenous population is protected.	No indigenous people's issues have emerged during the project. However, dovetailing of SC/ST communities and the poor and marginal farmers, including women, is being done for promoting enterprise activities such as tailoring, mushroom, chicks rearing, horticulture and kitchen garden.
Gender and social dimension	It is expected that KNNL should carryout meaningful consultations that are gender inclusive and responsive with various institutions primarily the Contractor and the WUCS on an ongoing basis throughout the project cycle.	The Contractor has provided cooking gas to the workers' which reduces the cooking burden on the female in the worker households. At the WUCS level, the WUCS have taken initiative to increase the number of women participating in the WUCS Committee from 2 to 3.



Facilities provided to workers at camp site – living space and toilets



A view of kitchen, kitchen waste bin and soak pit for waste water

NATIONAL EDUCATION SOCIETY (N.E.S.)
Jawahar Lal Nehru National College of Engineering
 (Affiliated to Visvesvaraya Technological University & Recognized by AICTE & Accredited by NBA)
DEPARTMENT OF CIVIL ENGINEERING
 SHIMOGA - 577 204
 KARNATAKA STATE

Ref. No.: JNMCE/CE DTG / 2019-20 Date: 09/09/2019

To,
 The Assistant Executive Engineer,
 KNNL, No.3 BR/BC sub division,
 Bhadravathi.

Sub: Testing of water sample for the work of Modernisation of Gondi main canal and distribution in Shimoga district.
 Ref: Your letter No. AEE-3 / KNNL / BR/BC / Water test / 2019-20 / 200
 Dated 05/09/2019

Sl.No	Parameters	Units	Water Sample	Limits
1	pH		8.92	6.5 - 8.5
2	Acidity	mg/L	10	200
3	Alkalinity	mg/L	14	300
4	Hardness	mg/L	430	500
5	Calcium	mg/L	61	75
6	Chloride	mg/L	145	250
7	Dissolved oxygen	mg/L	4.50	-
8	Color		-	-
9	Turbidity	NTU	0.30	10 NTU
10	Total dissolved solids	mg/L	891	500 - 1000
11	Iron	mg/L	0.001	0.30
12	Fluoride	mg/L	00	1.50
13	Sulphate	mg/L	334	250
	Potable / Non potable		Potable	

Note: 1. Water sample was supplied by the client.
 2. Place is as mentioned in the client's letter in the above reference.
 3. This report is strictly confidential and its use for publicity arbitration / evidence on legal disputes is forbidden.

Assistant Executive Engineer
 KNNL, No. 3 BR/BC Sub-Division
 Bhadravathi

Staff in charge
 H.O.D.

E-mail: jncce@kannada.com Website: www.jncce.ac.in

Ground water quality report at camp site

DATE: 09-2019

M/S RPP Infra Project Ltd, And M/S Ramalingam Construction (P) Ltd, Exposed
 Tamilnadu Road Road Bhadravathi Bhadravathi
 "Modernisation in Shimoga District of Karnataka State India" of modernisation
 work started by contractor M/S RPP Infra Project Ltd
 and M/S Ramalingam Construction (P) Ltd. The
 work is in progress. The work is in progress.
 The work is in progress. The work is in progress.

Assistant Executive Engineer
 KNNL, No. 3 BR/BC Sub-Division
 Bhadravathi

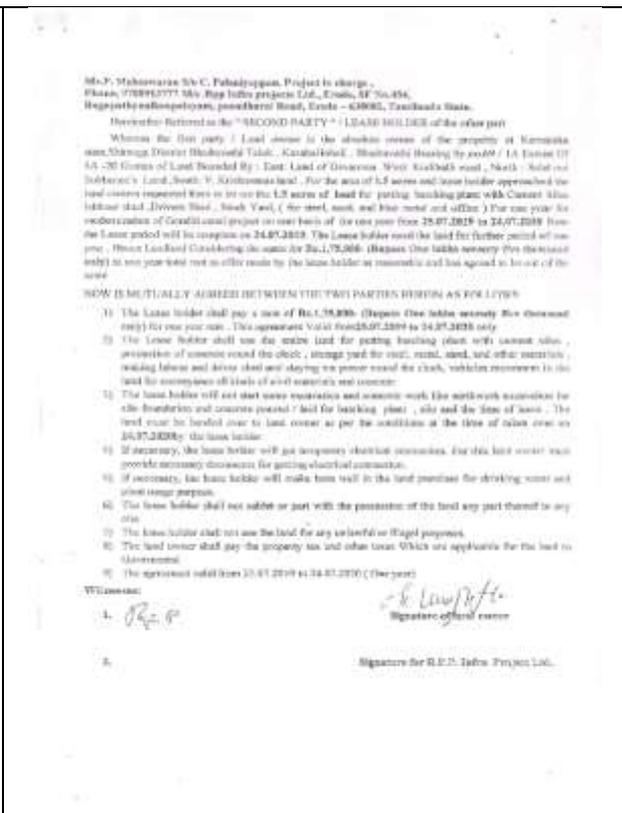
Staff in charge
 H.O.D.

25 members out of 30 members are
 present in the camp site.

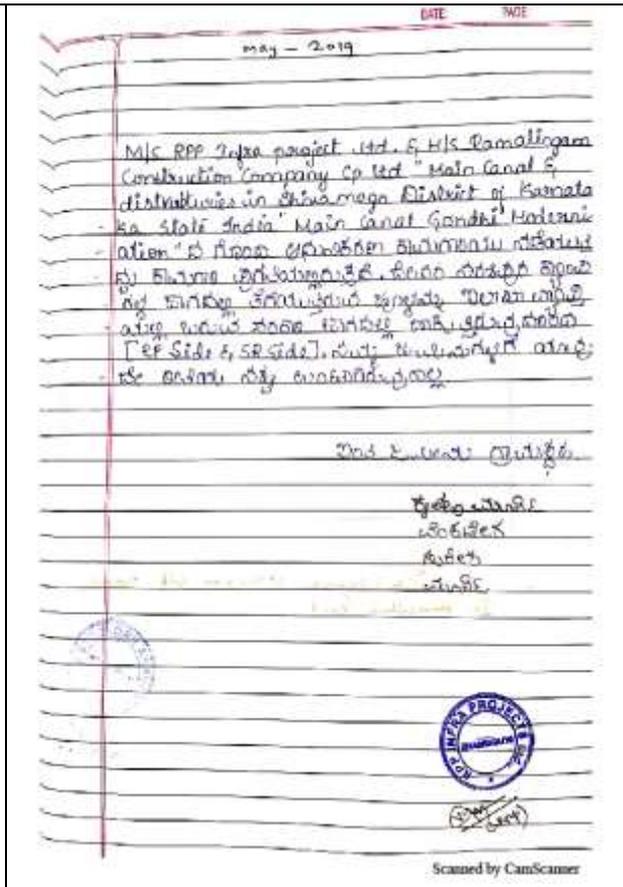
Monthly health camps register at camp site



Contractor's team planting compensatory trees



Camp site land lease agreement with land owner



Silt disposed in agricultural land – consent letter from farmers



Project promoting organic farming and organic remedies for pests



Canal overflowing during monsoon