

KARNATAKA NEERAVARI NIGAM LTD



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

ADB LOAN No. 3172-IND

**VIJAYANAGARA CHANNELS  
FEASIBILITY STUDY REPORT**

**Volume 3b: Social Safeguard Due Diligence Report**



Project Management Unit, KISWRMIP  
Karnataka Neeravari Nigama Ltd (KNNL)

Project Support Consultant  
**SMEC International Pty. Ltd. Australia**  
*in association with*  
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## ABBREVIATIONS

ADB	:	Asian Development Bank
CADA	:	Command Area Development Authority
CCA	:	Culturable Command Area
DDR	:	Due Diligence Report
FGD	:	Focus Group Discussion
IWRM	:	Integrated Water Resources Management
IP	:	Inspection Path
IR	:	Involuntary Resettlement
KISWRMIP	:	Karnataka Integrated and Sustainable Water Resources Management Investment Program
KNNL	:	Karnataka Neeravari Nigam Limited
LAAR	:	Land Acquisition, Rehabilitation and Resettlement
LARP	:	Land Acquisition and Resettlement Plan
MFF	:	Multi-Tranche Financing Facility
MGNREGA	:	Mahatma Gandhi National Rural Employment Guarantee Act
NGO	:	Non-Governmental Organization
OBC	:	Other Backward Classes
O&M	:	Operation and Maintenance
PIO	:	Project Implementation Office
PSC	:	Project Support Consultant
RF	:	Resettlement Framework
RFCTLARR Act	:	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013
RoW	:	Right of Way
SC	:	Scheduled Caste
SHG	:	Self Help Group
SR	:	Service Road
VNC	:	Vijayanagara Channels
WRD	:	Water Resources Department
WUCS	:	Water Users Co-operative Society

# SOCIAL SAFEGUARD DUE DILIGENCE REPORT

## A. BACKGROUND

1. The Karnataka Integrated and Sustainable Water Resources Management Investment Program (KISWRMIP), funded by Asian Development Bank, aims to manage and sustain the increasingly scarce water resources in the selected water scarce river basins in the State of Karnataka (the State) in India. It aims to establish and strengthen state and basin level institutions adopting the principles of integrated water resources management (IWRM) in the Tungabhadra sub-basin (of the Krishna basin). With water for agriculture utilizing over 80% of the State's water resources, investment support will be provided for sub-basin wise planning to modernize and improve irrigation service delivery while strengthening relevant institutions—state departments and irrigation water user cooperative societies (WUCS).
2. KISWRMIP is a multi-tranche financing facility (MFF) program and proposed to be executed in a period of seven years from 2014 to 2021 in two Tranches with the aim of modernization (rehabilitation) of irrigation infrastructure on three irrigation projects within the Tungabhadra (K-8) sub-basin. ADB February 2018 Mission has recast the KISWRMIP into three tranches, for Gondi, VNC and TLBC respectively, to complete by the year 2024. Hence, Tranche 1 envisaged modernization (rehabilitation) of Gondi irrigation system which is currently ongoing whereas Tranche 2 envisages modernization (rehabilitation) of Vijayanagara and Tranche 3 Tungabhadra Left Bank Canal and all associated infrastructure. Other components include flow measurement & telemetry system supply and installation, strengthening asset management and main system operation and maintenance (O&M) and capacity building of WUCS (Water Users Cooperative Societies). 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.
3. The Vijayanagara Channel system is spread across 3 districts namely Bellary, Raichur and Koppal. These channels were constructed during the period of Vijayanagara kingdom more than 600 years ago. The overall program will improve water availability for competing water demands in selected river basins by implementing integrated water resources management (IWRM) and improving irrigation services delivery in the State. It will support increased water use efficiency to provide economic opportunities and improve rural incomes, with a focus on women. The program will focus on Krishna basin, and specifically within the Tungabhadra sub basin for implementation of physical works.
4. The objective of the social safeguard due diligence study is to make an assessment of: (a) the existing status and condition of the channel system; (b) social risks in anticipation of the proposed modernization (rehabilitation) works in terms of involuntary resettlement issues, and (c) indigenous people etc. The due diligence is based on social and environmental assessment including extensive consultations with farmers and other stakeholders in the project area. The report aims to conform with the country/state policy as well as ADB policy framework and provides suitable recommendations to fulfil any identified potential gaps and mitigate such impacts. The scope of the SDDR is enlarged further based on the comments and suggestions from the ADB review mission February 12-19, 2018.

## B. PROJECT DESCRIPTION

5. The Vijayanagara Channels were constructed during the period of Vijayanagara kingdom more than 400 years ago. The 16 channels identified for the project fall under Hospet, Gangavathi, Siruguppa, Manvi and Raichur Tehsil(s)/Taluk(s) spread over 3 Districts namely Bellary, Raichur and Koppal.
6. The channels though under operation are in deteriorated condition having low conveyance efficiency due to deferred maintenance. Under operation for two seasons in a year, the channels have lost their shape along several stretches due to scouring effect and accumulation of silt. Conveyance of water supply to the tail-end areas is hampered in particular during the irrigation season. The Channel system being unlined, is utilizing 12.05 TMC for irrigating 16,241 ha under both Kharif and Rabi. Post modernization (rehabilitation), water utilization is planned to be limited to 5.8 TMC only which is estimated to be able to cater to the entire command area. The command area is 11,154 ha. Looking at the poor state of the channel infrastructure, modernization (rehabilitation) estimate was prepared incorporating dismantling and reconstruction of dilapidated structures and providing concrete lining throughout the length of the channel to enable conveyance of water to tail ends of the channel system and to prevent seepage losses, thereby saving water. Currently, the Channel network of Vijayanagara Channel system is partially lined leaving a major portion unlined. Now, to optimize utilization of water, it is proposed to line the entire Channel system (main channels, distributaries and field irrigation channels).
7. Hence, it is necessary to redesign the channel section with concrete lining. This will also help in improving water conveyance efficiency in the channel system. To have uniform quality of concrete lining and for better compaction, mechanical paver lining is proposed where the bed width is more than 1.20 m. For other reaches where the bed width is less than 1.2 m, manual concrete lining is proposed. Lining has been proposed for the entire length upto free board with concrete coping on either side for a width of 0.30 m.

## C. PROJECT COMPONENTS

8. The modernization (rehabilitation) of 16 channels comprises the following physical works:
  - Improvements to existing anicuts and controlling arrangements;
  - Concrete lining of channels;
  - Construction of cart bridges;
  - Construction of washing platforms;
  - Construction of cattle ramps;
  - Construction of pipe outlets;
  - Construction of inlets;
  - Construction of drops;
  - Construction of escape sluices;
  - Construction of relieving weirs;
  - Improvements to service roads and inspection paths, and
  - Formation for construction of approach road wherever necessary.
9. Implementation of all physical works are proposed to be carried out on existing canals or service roads and inspection paths. No new land acquisition is envisaged.

## D. SURVEYS AND FINDINGS

10. The PSC multidisciplinary team walked along all the 16 channels and interacted with farmers, community leaders, women groups, and KNNL and CADA engineers. Consultations and focus group discussions (FGD) were organised in different localities by ethnicity, type of farmers and other locally specific characteristics as part of the assessment. During the field visits and subsequent discussions, line diagrams were used for identifying and assessing the condition of service road and inspection path of each channel. In total, 312 persons participated in the consultations and FGDs. The PSC team members explained to them about the proposed modernization (rehabilitation) works and sought their active participation for successful implementation and management of the project. The significance of their WUCS roles and responsibilities and other stakeholders was also explained. Overall, participants in the public consultations and focus group discussions seemed quite interested in the project which they felt would bring them enhanced agrarian returns and provide livelihood stability. Further, they expressed their readiness to take up their due role in the implementation of the project as they are aware of the merits of this project, and its effect on enhancing the living standards of farmers. During visits to the channels/villages, it was noticed that farmers associations were formed several years ago and vibrant in some of the Vijayanagara Channel areas. Communities have been carrying out operation and maintenance work with their own resources. In a few localities, panchayat authorities agreed to utilise MGNREGA funds for operation and maintenance of the channels/distributaries, especially the labour component.



*Focus Group Discussions with Farmers and Community members*

11. During the process of project preparation as per MFF loan modality, a resettlement framework (RF) was prepared according to the ADB Safeguard Policy and RFCTLARR Act 2013 requirement. The RF outlines guidance for preparation of a resettlement plan (RP) in case of need for land acquisition or involuntary resettlement impact. The RF describes the objective, scope of application, procedure and principles applied to provide



compensation to people who may lose their assets (land and/or non-land assets) and livelihoods temporarily or permanently.

12. The RF for the MFF KISWRMIP was prepared in accordance with the ADB Policy and approved by ADB in 2013. The RF has been updated to comply with the requirements described in the ADB SPS 2009 after the enactment of the RFCTLARR Act, 2013 and related State rules and policies.
13. ***Since project intervention will be limited to the existing RoW and does not involve any land acquisition or cause any adverse impacts on people's assets and/or livelihoods, there is no need for a Resettlement Plan.*** However, considering the nature of interventions proposed under the programme, the following mitigation measures are proposed to be adopted for the Project:

### Mitigation measures

14. The project shall pay careful attention to avoid or minimize impacts on likely affected people, even though the level of impact will be limited. The project will undertake the following mitigation measures.
  - *Minimizing working areas.* Limiting all interventions within the existing canal RoW;
  - *Prior notification of timings* of physical works in cultivated areas to allow farmers to harvest crops before commencing any works;
  - *Timing of works*, wherever possible, should be such that it permits owners or tenants sufficient time to harvest crops before commencing any works;
  - *Avoiding adverse impacts* on any nearby built-up properties by constructing retaining walls and minor realignment of the canal within the existing RoW;
  - *Restoration* of existing washing platforms and construction of cart bridges, cattle troughs, service roads etc. as per local requirement;
  - *Expediting the works* to mitigate loss of agricultural potential;
  - *Stripping and preserving top soil* from affected areas for future restoration;
  - Reinstating the working areas, including replacing top soil to mitigate any longer-term reduction on crop yields etc;
  - *Minimizing cutting or removal of trees*, particularly cash producing fruit or nut trees, and
  - *Planting trees* as prescribed as compensation for trees removed once the area has been restored.
15. The availability of land and adequacy of available right of way was confirmed from the concerned Executive Engineer of the Implementing Agency. This was further confirmed during consultation with farmers during field survey and assessment of impacts.
16. Lining work of the channel and other structures are planned based on the concept of implementing physical works involving no land acquisition and resettlement (LARR) impact. The subprojects proposed under Tranche 2 thereby are classified as Category "C" project as per ADB safeguards policy. However, during implementation of the infrastructure works, the sub-project requires compliance with ADB's safeguards requirements on involuntary resettlement (IR), adhering to Indian laws and policies, to make sure that the project followed all safeguard requirements, and no one is disadvantaged in the process of development.

17. Under the terms of construction contract, the Contractor is responsible for negotiation with the owners or tenants before the commencement of works. However, during the construction, there may be some temporary disturbance caused by the Contractors. Such a disturbance would possibly be incurred by excavation and lining works, mobilising machinery and equipment to the site, limited access to agricultural land, plots in the neighbourhood of the construction site. Besides, the contractor may agree to assist the farmers with some land drainage works, or cleaning old or blocked tertiary irrigation ditches etc. While this is largely a self-regulating process, the PIO will monitor civil works, intervenes as necessary and mediates in the event of any disputes. Contractors are provided with a construction methodology to ensure that any temporary land access impacts are documented and verified. A Resettlement Framework is also in place to ensure that contractors have guidance in the event when voluntary donations, negotiated settlements or involuntary displacement would occur. In all cases, agreements with the farmers will be documented and verified by a third party. This documentation will be collected by KNNL from the contractor and included within the Safeguard Monitoring Reports that are submitted to ADB and disclosed on the ADB website bi-annually.
18. During consultations with farmers and panchayats, no objections were raised except that farmers expect to be provided ample time to harvest their crop before construction occurs; farmers expressed their interest to support the implementation of the project. Around 70% of the active population are cultivators who work their own land, which is mostly distributed along the inspection path (IP). They have extended cultivation in some portions of the land. Based on field assessment, a strip map has been prepared for each of the channels (km wise) and attached as **Annexure 2**. A construction methodology for how farmers should address temporary land access is provided in **Annexure 1**.
19. **Legend in the Strip Maps:** In the strip maps, green shade denotes crops, vegetation and trees, yellow shade denotes infrastructure such as houses, religious institutions, schools, toilets (permanent, semi-permanent and temporary structures along the embankments on service road and inspection path), brown shade denotes heritage and conservation areas, red shade denotes waste/drainage water, solid waste, open defecation etc. Blue shade denotes urban area along Raya, Basavanna, Gangavathi and Siruguppa channels.
20. Findings of the social and environmental assessment of the channels are presented in Table 1 given below.

**Table 1: Findings of the Social and Environmental Impact Assessment of Channels in VNC**

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
Raya Channel (27.74 km)	<ul style="list-style-type: none"> <li>The Raya channel takes off from Tungabhadra Dam right bank. There is a separate sluice at km 2.5 of this channel to meet the requirements of water of Bella channel.</li> <li>Total length of the Raya Channel is 27.74 km, which covers around 2016 ha CCA.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from service road throughout the length of the channel except for Ch. 2.2 to 2.3 km. Entry for construction work is from the Ch 0.</li> <li>Out of 27.74 km 19.12 kms (68.9%) encroached in inspection path for cultivation.</li> <li>Urban area covers from Ch.6.62</li> </ul>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
	<ul style="list-style-type: none"> <li>The urban area extends from Ch. 6.62 to 9.62.</li> <li>About 7 washing platforms are located at different locations of the channel.</li> <li>Main crops cultivated are jowar, paddy, sugar cane and banana.</li> <li>Total trees around the embankments are 458; details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>to 9.62.</li> <li>From Ch. 6.62 to 9.62, inspection path is encroached with 20 permanent buildings (mostly residential buildings) and compound walls of a Hotel.</li> <li>Ch. 20.10 to 20.20 is part of Hampi heritage area along inspection path</li> </ul> <p>Details are given in the strip maps.</p>
<p>Basavanna Channel (16.5 km)</p>	<ul style="list-style-type: none"> <li>The Basavanna channel takes off from Tungabhadra Dam right bank. Total length of the channel is 16.5 km, which covers 1240 ha of CCA.</li> <li>Urban area (Hospet city) covers from Ch.3.26 to 6.00 km. No command in this location.</li> <li>The city sewerage connection is linked to the channel system and the water is polluted.</li> <li>At 6.8 kms distance, discharge from sugar factories mixes with channel water.</li> <li>9 washing platforms along the embankments.</li> <li>In total, 23 permanent buildings and 16 semi-permanent buildings (mostly residential), 3 commercial units, 6 toilets, 3 temporary buildings and 1 school compound encroached along inspection path.</li> <li>Approximately, 500 meters is not accessible from Ch.16 to 16.5 (no service road and inspection path).</li> <li>In service road -Ch.6.00- 6.38, 6.54-6.7, 7.00-7.14, 7.58-7.74 and in inspection path 6.38-6.54, 6.70-6.86 - Municipal waste dumping sites</li> <li>Total trees around the embankments are 217; details are provided in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from service road throughout the length of the channel except for Ch. 16 to 16.5 km. Entry for construction work is from the Ch. 0.</li> <li>Out of 16.5 kms, only 3.5 kms in the inspection path is encroached for cultivation.</li> <li>Urban area (Hospet city) covers from Ch.3.26 to 6.00 km. No command in this location.</li> <li>Ch. 3.26 to 6.00 - 23 permanent and 16 semi-permanent buildings, 3 temporary buildings, 6 toilets, 3 commercial units and 1 school compound in the inspection path.</li> <li>Approximately 500 meters is not accessible from Ch.16 to 16.5 (no service road and inspection path).</li> <li>In service road -Ch.6.00- 6.38, 6.54-6.7, 7.00-7.14, 7.58-7.74 and in inspection path 6.38-6.54, 6.70-6.86 - Municipal waste dumping sites</li> </ul> <p>Details are given in the strip maps.</p>
<p>Bella Channel (5.5 km)</p>	<ul style="list-style-type: none"> <li>Total length of the channel is 5.5 km, which covers 600 ha CCA.</li> <li>Ch.3.32 to 3.9 - 22 structures (8 permanent, 10 semi-permanent and 4 temporary) along the service road, belonging to mostly scheduled tribes and scheduled</li> </ul>	<ul style="list-style-type: none"> <li>Anicut is accessible</li> <li>Full access from service road is available for modernization (rehabilitation) work, with the exception of Ch.3.3 to 3.9 km. However, access from parallel road is available for movement of vehicles, equipment and</li> </ul>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
	<p>caste community.</p> <ul style="list-style-type: none"> <li>0.8 kms (14.5%) of inspection path used for cultivation.</li> <li>Total trees around the embankments are 360; details are given in the Tree survey report.</li> </ul>	<p>construction materials.</p> <ul style="list-style-type: none"> <li>Ch.3.32 to 3.9 - 22 structures (8 permanent, 10 semi-permanent and 4 temporary) along the service road, mostly belonging to scheduled tribes and scheduled caste community.</li> <li>0.8 kms (14.5%) of inspection path used for cultivation</li> </ul> <p>Details are given in the strip maps.</p>
<p>Kalaghatta Channel (7.02 km)</p>	<ul style="list-style-type: none"> <li>Total length of the channel is 7.02 km, which covers around 237 ha of CCA.</li> <li>Around 3.58 km is under cultivation of seasonal crops such as Jowar, Groundnut, Paddy, Sugarcane and Banana.</li> <li>The quality of water is poor due to sewerage and drainage water, and also wastewater from the sugar factory.</li> <li>Total trees around the embankments are 228 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Full access from service road is available for modernization (rehabilitation) work, with the exception of Ch. 4.2 to 4.68 to 5.6 and 6.2 km.</li> <li>1 permanent and 1 temporary building along service road</li> <li>3.58 kms (51%) used for cultivation. Main crops are Jowar, Groundnut, Paddy, Sugarcane and Banana.</li> <li>The quality of water is poor due to sewerage and drainage water and also wastewater from the sugar factory.</li> </ul> <p>Details are given in the strip maps.</p>
<p>Turtha Channel (18.69 km)</p>	<ul style="list-style-type: none"> <li>Total length of the Channel is 18.69 km, which covers 931 ha of CCA.</li> <li>Turtha comes under Hampi Heritage area and the monuments listed are given in the Strip maps.</li> <li>Around 8.8 km of stretch are used for cultivation of seasonable crops such as Banana, Paddy, Groundnut, Sugar cane etc.</li> <li>Total trees around the embankments are 261 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from service road throughout the length of the channel with the exception of km. Entry for construction work is from the Ch 0.</li> <li>Turtha comes under Hampi Heritage area. Monuments listed are given in the Strip maps.</li> <li>Ch. 9.8 km, 1 permanent building and Ch.15.82 to 16.5, 10 permanent building along inspection path</li> <li>8.8 km (47.1%) used for cultivation. Main crops are Banana, Paddy, Groundnut, Sugar cane etc.</li> </ul> <p>Details are given in the strip maps.</p>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
<b>Ramasagara Channel (15.50 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 15.50 km of which covers 673 ha of CCA.</li> <li>2 washing plat forms are located at 6.8 km and 7.6 km.</li> <li>1 abandoned building on inspection path and 1 religious structure along service road</li> <li>Farmers are using 6.12 km stretch for cultivation of crops such as Jowar, Ground nut, Paddy, Banana, and Sugar cane.</li> <li>0.16 km of inspection path and service road is used for waste dumping and open defecation</li> <li>Total trees around the embankments are 319 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0.</li> <li>6.12 km (39.5%) is encroached for cultivation; main crops are Jowar, Ground nut, Paddy, Banana, and Sugar cane.</li> <li>One abandoned building on inspection path and one religious structure along service road (not encroached)</li> <li>0.16 km of inspection path and service road is used for waste dumping and open defecation</li> </ul> <p>Details are given in the strip maps.</p>
<b>Kampli Channel (23.55 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 23.55 km which covers 620 ha of CCA.</li> <li>Ch.10.00 km 1 temporary house at inspection path</li> <li>Waste disposal temporary shed at Ch.20.10 to 20.20 in inspection path</li> <li>16 kms of inspection path is being used for cultivation of seasonable crops mainly Bananas, Paddy, Jowar, Groundnut and Sugar cane.</li> <li>Total trees around the embankments are 85 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>No access to anicut</li> <li>Access is available from service road throughout the length of the canal with the exception of 2.5 km. Entry for construction work is from Ch 0.</li> <li>Ch.10.00 km 1 temporary house at inspection path</li> <li>16 km (67.9%) encroached for cultivation. Main crops are Bananas, Paddy, Jowar, Groundnut and Sugar cane.</li> <li>Waste disposal temporary shed at Ch.20.10 to 20.20 at inspection path</li> </ul> <p>Details are given in the strip maps.</p>
<b>Belagodahalla Channel (11.22 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 11.22 km, which covers 210 ha of CCA.</li> <li>Entire length of inspection path of the channel is used for cultivation of seasonable crops such as Jowar, Groundnut, Banana and Paddy.</li> <li>Ch.10.69 to 11.00 is used for waste dumping and open defecation</li> <li>Total trees around the embankments are 139; details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from SR throughout the length of the canal except Ch. 1.7 at railway bridge. Entry for construction work is from Ch. 0.</li> <li>Entire inspection path (11.22 km -100%) is encroached for cultivation.</li> <li>Ch.10.69 to 11.00 is used for waste dumping and open defecation</li> </ul> <p>Details are given in the strip maps.</p>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
<b>Siruguppa Channel (10.85 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 10.85 km, which covers 764 ha of CCA.</li> <li>Ch.0.36 and 8.25 to 8.5, 21 permanent houses in inspection path</li> <li>1 religious structure at Ch. 2.6 along service road</li> <li>Inflows from the city drainage system are leading to the canal water pollution.</li> <li>Total trees around the embankments are 153 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Anicut accessible through SR.</li> <li>Access is available from SR throughout the length of the channel except at Ch. 1.7 near railway bridge. Entry for construction work is from the Ch 0.</li> <li>0.36 and 8.25 to 8.5, 21 permanent houses in inspection path</li> <li>1 religious structure at Ch. 2.6 along service road</li> <li>7.92 km (73%) encroached for cultivation</li> </ul> <p>Details are given in the strip maps.</p>
<b>Deshnur Channel (9.03 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 9.03 km, which covers 478 ha of command area.</li> <li>Entire length is free from any encroachments and readily available for modernization (rehabilitation) work.</li> <li>1 permanent building and portion of small house at Ch.2.6 and 5.1 in inspection path</li> <li>Total trees around the embankments are 119; details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Anicut accessible through service road</li> <li>Access is available from service road throughout the length of the channel.</li> <li>Entry for construction work is from the Ch 0.</li> <li>1 permanent building and portion of small house at Ch.2.6 and 5.1 in inspection path</li> <li>7.22 kms (80%) encroached for cultivation in inspection path</li> </ul> <p>Details are given in the strip maps.</p>
<b>Hulugi Channel (10.69 km)</b>	<ul style="list-style-type: none"> <li>Total length of the channel is 10.69 km, which covers 265 ha of CCA.</li> <li>Service road between Ch. 0.70 to 1.40 and 4.32 to 4.36 is not accessible due to silt dumping.</li> <li>Solid wastes are dumped from Ch.2 to Ch.2.4 of the channels especially from the religious institutions and shops.</li> <li>Under Ground Drainage and sewerage system from the town is also connected to the channel.</li> <li>Total trees around the embankments are 53 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access to anicut is available from Ch.0.</li> <li>Access is available from SR throughout the length of the channel except at Ch. 1.7 near railway bridge.</li> <li>Entry for construction work is from the Ch 0.</li> <li>Ch. 0.70 to 1.40 and 4.32 along 4.36 service road is not accessible due to silt dumping.</li> <li>Ch. 2.0 to 2.45 km is encroached by a compound wall of a religious structure along the inspection path embankment.</li> <li>Ch. 2.4 is encroached by religious structure in service road and a temporary building at Ch.2.5.</li> <li>Solid wastes are dumped from Ch.2 to Ch.2.4 of the channels</li> </ul>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
		<p>especially from the religious institutions and shops.</p> <ul style="list-style-type: none"> <li>Under Ground Drainage and sewerage system from the town is also connected to the channel.</li> <li>3.44 km (32.2%) is encroached for cultivation along inspection path.</li> </ul> <p>Details are given in the strip maps.</p>
Shivapura Channel (6.54 km)	<ul style="list-style-type: none"> <li>Total length of the channel is 6.54 km, which covers 403 ha of CCA.</li> <li>In and around Anicut area 2 acres of land is used for cultivation.</li> <li>3.40 km are used for cultivation of seasonable crops such as paddy, ground nuts, Jowar and sugar cane.</li> <li>Total trees around the embankments are 54 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from service road throughout the length of the channel except for Ch. 0 to 2. Entry for construction work is from the Ch 0.</li> <li>Ch.0 to Ch. 2, no accessibility of service road and inspection path</li> <li>3.40 km (52%) is encroached for cultivation along inspection path.</li> <li>Ch.5.6 to 5.74, Ch.5.8 to Ch.6, Ch.6.14 to 6.3, 3 religious structures encroached along inspection path</li> </ul> <p>Details are given in the strip maps.</p>
Anegundi Channel (19.44 km)	<ul style="list-style-type: none"> <li>Total length of the channel is 19.44 km, with 789 ha of CCA.</li> <li>10.44 km are used for cultivation of crops such as paddy, ground nuts, Jowar and sugar cane.</li> <li>Heritage area Ch. 0 to 8.5 km.</li> <li>3 Shops and temporary shelters 6.62 to 6.8 km in SR.</li> <li>6 toilets and 3 temporary houses at Ch.15.0 15.50, boundary walls of Auxiliary Nurse Midwife (ANM) quarters (health department), rural bank and school compound at inspection path</li> <li>Total trees around the embankments are 462; details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Access is available from SR throughout the length of the canal except for Ch. 1.22 to 1.44 (2 small shops). Entry for construction work is from the Ch 0.</li> <li>Heritage area Ch. 0 to 8.5 km.</li> <li>10.44 km (53%) of inspection path encroached for cultivation.</li> <li>3 Shops and temporary shelters 6.62 to 6.8 km in SR.</li> <li>6 toilets and 3 temporary houses at Ch.15.0 15.50, boundary walls of Auxiliary Nurse Midwife (ANM) quarters (health department), rural bank and school compound at inspection path</li> </ul> <p>Details are given in the strip maps.</p>
Upper Gangavathi Channel (9 km)	<ul style="list-style-type: none"> <li>Total length of the channel is 9 km and the command area are 775 ha.</li> <li>300 m in the beginning of service road occupied by crops like floriculture, bananas etc.</li> <li>The accessibility to service road is affected due to the dumping of the silt from the channel.</li> </ul>	<ul style="list-style-type: none"> <li>No access to Anicut from Ch. 0 to 1.5 from both service road and inspection path</li> <li>Access is available from service road and alternate panchayat road throughout the length of the channel except for Ch. 0 to 1.50. Entry for construction work is</li> </ul>

Name of the Channel	Situation of Social and Environmental aspects	Findings and Observations
	<ul style="list-style-type: none"> <li>2.24 km (24.9%) is encroached for cultivation.</li> <li>Ch.8.6 to 8.8-8 temporary houses encroached along the inspection path</li> <li>Total trees around the embankments are 128 and details are given in the Tree survey report.</li> </ul>	<p>from the Ch. 0.</p> <ul style="list-style-type: none"> <li>Ch.2.18 to 2.32, one religious structure encroached on inspection path</li> <li>Ch.8.6 to 8.8 – 8 temporary houses encroached along inspection path</li> <li>2.24 km (24.9%) is encroached for cultivation.</li> </ul> <p>Details are given in the strip maps.</p>
Lower Gangavathi Channel (9.54 km)	<ul style="list-style-type: none"> <li>Total length of the channel is 9.54 km, which covers 667 ha of CCA.</li> <li>Ch.6.6 to 6.82, 1 religious structure on the service road.</li> <li>Ch.8.0 to 8.32, 1 religious structure, 1 temporary cow shed, and 2 abandoned structures on service road</li> <li>Ch.9.0 to 9.08 brick kiln and small house along inspection path</li> <li>Ch.9.8 to 9.9,1 temporary house encroached on inspection path</li> <li>Ch.9.7 to 10.0 open defecation and solid wastes dumping</li> <li>Washing platform Ch. 3.7 (washing clothes, utensils, bathing etc.).</li> <li>Total trees around the embankments are 228 and details are given in the Tree survey report.</li> </ul>	<ul style="list-style-type: none"> <li>Anicut accessible from Ch.0.</li> <li>The following assets are encroaching however access for construction of the canal is still possible by working around these assets: <ul style="list-style-type: none"> <li>Ch.6.6 to 6.82 religious structure along the service road</li> <li>Ch.8.0 to 8.32, 1 religious structure, cow shed, and a damaged stone structure on service road.</li> <li>Ch.9.0 to 9.08 brick kiln and small house along inspection path</li> <li>Ch.9.8 to 9.9,1 temporary house encroached on inspection path</li> <li>Ch.9.7 to 10.0 open defecation and solid wastes dumping</li> </ul> </li> </ul> <p>Details are given in the strip maps.</p>
Bichal Channel (14.52 km)	<ul style="list-style-type: none"> <li>Total length of the channel is 14.52 km, which covers 276 ha of CCA.</li> <li>Except for initial 1 km stretch, entire area service road not accessible due to wild vegetations.</li> <li>Ch.13.38 to 13.68 encroachment of inspection path for private use (for fisheries).</li> <li>Total trees around the embankments are 181; details are given in the Tree survey report.</li> <li>143 open wells constructed for irrigation purpose in the beginning.</li> <li>Entire inspection path is used for cultivation of seasonal crops such as Cotton, Chilly, Sugar cane, Paddy and Jowar.</li> </ul>	<ul style="list-style-type: none"> <li>Anicut accessible from Ch.0.</li> <li>Access to SR available only for Ch.0 to 1 due to wild vegetations. Approach road construction is essential before starting construction work.</li> <li>Ch.13.38 to 13.68 encroachment of inspection path for private use (for fisheries).</li> <li>Entire inspection path is used for cultivation of seasonal crops such as Cotton, Chilly, Sugar cane, Paddy and Jowar.</li> </ul> <p>Details are given in the strip maps.</p>



**Table 2: Summary of Encroachment findings from Channel Surveys (shown on Strip Maps)**

S. No	Channel Name	Detail	Chainage in km	Encroachment		Channel wise encroachment (km)
				SR in km	IP in km	Colour Code
1	Raya (27.74 km)	Inspection path encroached by Priyadarshini Pride Lodge including building of permanent wall	9.00			3.00
		Wastewater drain from Nagenahalli Village entering canal	12.60			0.08
		Hampi Heritage monument at about 100m away from inspection path	20.10 to 20.20			0.1
		Urban area ((20 permanent buildings and hotel compound walls)	6.62 to 9.62		6.62 to 9.62	3.00
		Encroachment along inspection path for cultivation				19.12
2	Basavanna (16.50 km)	Urban area (23 permanent, 16 semi-permanent buildings, 6 toilets, 3 commercial units, 3 temporary and one School compound in the inspection path)	3.26 to 6.00		3.26 to 6.00	2.70
		Compound wall of a house in inspection path	0.36-0.54			0.18
		Pump house and cultivation in inspection path	10.2			3.53
		Municipal waste dumping on service road and inspection path				1.28
3	Bella (5.50 km)	Inspection path (IP) encroached by religious institution for having their activities; however, the structure is outside the IP.	0.60 to 0.82		0.22	0.8
		Temporary hut and trees in service road	1.70 to 1.88	0.18 km		
		1 Small religious structure on the service road embankment and a temporary hut	2.40 to 4.00	1.60 km		1.78
		8 permanent and 10 semi-permanent and 4 temporary buildings along service road	3.30 to 3.90	0.60		0.60

S. No	Channel Name	Detail	Chainage in km	Encroachment		Channel wise encroachment (km)
		Cultivation along inspection path (mostly bananas and sugar cane)	3.8 to 4.18		0.38	
		Coconut Trees along inspection path	4.82 to 5.00		0.18	
4	Kalaghatta (7.02 km)	Encroachment for cultivation along inspection path			3.58	3.58
		1 permanent and 1 temporary houses along service road	4.68 to 5.60, and 6.30 to 6.50	4.68 to 5.60 and 6.30		
5	Turtha (18.69 km)	Heritage area	8.57			8.57
		Encroachment for cultivation along inspection path				8.82
		1 permanent building on service road	9.8		9.8	0.08
		10 permanent buildings on inspection path	15.70 to 16.30		15.70 to 16.30	0.60
		Waste strewn on SR side and wastewater entry into canal	16.3			0.21
6	Ramasagara (11.22 km)	Encroachment for cultivation along inspection path			6.12	6.12
		Abandoned building structure on inspection path	7.1			0.18
		Religious structure along service road	8.9			
		No. 10 Muddapura village wastewater draining into the channel	8.9			0.16
		Service road and inspection path converted into open-defecation and waste dumping area.		0.30	0.67	
7	Kampali (23.55 km)	Encroachment for cultivation along inspection path			16.00	16.00
		Waste disposal in service road and inspection path			1.96	1.96

S. No	Channel Name	Detail	Chainage in km	Encroachment		Channel wise encroachment (km)
		Temporary shed in inspection path	20.10 to 20.20		0.10	0.10
8	Belagodahalla (11.22 km)	Encroachment for cultivation along inspection path		0.31	10.91	11.22
		Waste dumped into channel by villagers, service road used for open defecation and solid waste disposal	10.69 to 11.00		0.31	0.31
9	Siruguppa (10.85 km)	Urban area	8.00 to 10.00			2.00
		Encroachment of religious structure along service road and 21 permanent buildings in inspection path	2.6 and 8.25 to 8.50		0.36 and 8.25 to 8.50	0.37
		Waste strewn on service road side and wastewater entry into channel	8.5 to 8.70			0.46
		Encroachment for cultivation along inspection path				7.92
10	Deshnur (9.03 km)	Encroachment for cultivation along inspection path			7.22	7.22
		1 Permanent building and portion of small house on inspection path	2.6 and 5.1			0.28
		Portion of brick factory encroaching inspection path	5.3			
		Encroachment of service road for installing public water supply tank	8.6			
11	Hulugi (10.69 km)	Encroachment for cultivation along inspection path				3.44
		Boundary wall of religious structure along inspection path	2.00 to 2.45		0.6	0.72
		1 religious structure and 1 temporary building in service road				
		Silt dumped in service road	0.70 to 1.40 and 4.32 to		0.32	2.00

S. No	Channel Name	Detail	Chainage in km	Encroachment		Channel wise encroachment (km)
			4.64			
12	Shivapura (6.54 km)	Encroachment for cultivation along inspection path			3.40	3.40
		Silt disposal, UGD and drainage water connected to the channel			1.40	1.40
		2 Religious structure extended to inspection path and 1 religious structure along service road	5.58 to 5.74, 5.88 to 6.00 and 6.14 to 6.3		0.44	0.44
13	Anegundi (19.44 km)	Encroachment for cultivation along inspection path				10.44
		Silt disposal in inspection path	0.02		0.02	0.02
		Heritage area	0 to 8.50			8.50
		3 commercial units and temporary shed along service road	6.60 to 6.80	0.02		0.02
		3 temporary houses, 6 toilets, compound walls of ANM quarters (health dept), cooperative bank and school at Basavadurga and Kuruma camp along Inspection path;	15.00 to 15.50		0.5	2.04
14	Upper Gangavathi (9.00 km)	Encroachment for cultivation along inspection path				2.24
		Religious structure extended to inspection path	2.18 to 2.32		0.24	2.60
		Silt deposal in service road	3.32 to 3.48	0.16		2.38
		8 temporary buildings extended to IP	8.60 to 8.80		0.20	0.20
15	Lower Gangavathi (9.54 km)	Encroached for cultivation along inspection path			8.80	8.80
		1 Religious structure, 2 abandoned building, 1 temporary cow sheds along service road	6.6 to 6.82 8.0 to 8.32		0.54	0.57
		1 brick kiln and small house along inspection path	9.0 to 9.2		0.03	

S. No	Channel Name	Detail	Chainage in km	Encroachment		Channel wise encroachment (km)
			9.80 to 9.90			
		Waste dumped into service road and used for open defecation	Ch.9.7 to 10.0	0.64		0.64
16	Bichal (14.50 km)	Service road is accessible only up to Ch. 1.0 km; Later it is accessible only at certain locations. Service road has been encroached by farmers for cultivation purpose.	1.00 to 14.50	13.50		0.46
		Encroachment of inspection path for private use (fisheries)	13.38 to 13.68		0.30	
		Entire inspection path has been encroached by farmers for cultivation purposes.			13.06	13.06

**Colour Legend used in Table 2**

Habitation Encroachment on KNNL Land	Yellow
Cultivation Encroachment on KNNL Land	Green
Drainage water entering canal; waste disposal and open defecation on service road and inspection path	Red
Heritage Area and monuments	Brown
Urban area	Blue

21. As indicated in **Table 3**, the construction will not cause any permanent physical or economic displacement in any channels. The inspection path is invariably affected in all the channels. All of these issues relate to temporary use of land for diversion works. In all cases, farmers wholeheartedly welcomed the modernization (rehabilitation) of the anicuts and the channels. Further, they also indicated that they have no objection to the temporary use of their land and the encroached land along the inspection path for works related to flow diversion or other purpose.

**Table 3: Distribution of number of structures by Channels**

Name of the Channel	Number of Structures	Any objection from farmers for modernization (rehabilitation) work	Number of structures affecting access for construction	Comments <sup>1</sup>
Raya	20 Permanent structures and 1 compound wall of a hotel in inspection path	No, the farmers appealed that they should be permitted to do the ensuing harvesting.	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from the Ch 0.
Basavanna	42 (23 permanent, 16 semi-permanent houses, 3 temporary buildings, 3 commercial units and 1 school compound) in inspection path	No, the farmers appealed that they should be permitted to do the harvesting.	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Full access from service road is available for modernization (rehabilitation) work, with the exception of Ch.16 to 16.5 km.
Bella	22 (8 permanent, 10 semi-permanent and 4 temporary houses) in service road.	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	The Panchayat allotted the Govt. land for the construction of permanent houses in the service road. Access is available from service road (SR) throughout the length of the channel. Entry for construction work is from the Ch 0.
Kalaghatta	2 (1 permanent and 1 temporary house) along service road	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from the Ch 0.

<sup>1</sup> Refer to Strip Maps

Name of the Channel	Number of Structures	Any objection from farmers for modernization (rehabilitation) work	Number of structures affecting access for construction	Comments <sup>1</sup>
Turtha	11 (permanent buildings- 10 in inspection path and 1 in service road)	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from the Ch 0.
Ramasagara	1 abandoned building in inspection path and 1 religious structure along service road	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from the Ch 0.
Kampli	1 temporary building in inspection path	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from the Ch 0.
Belagodahalla	Nil	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from service road throughout the length of the channel. Entry for construction work is from Ch 0.
Anegundi	13 (6 toilets, 3 temporary houses, 3 commercial units and 1 temporary shelter)	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Heritage area Ch. 0 to 8.5 km. 3 commercial units and temporary shelters 6.62 to 6.8 km in service road; 6 toilets and 3 temporary houses at Ch.15.0 15.50, boundary walls of Auxiliary Nurse Midwife (ANM) quarters (health department), rural bank and school compound at inspection path.  Access is available from service road throughout the length of the channel. Entry for

Name of the Channel	Number of Structures	Any objection from farmers for modernization (rehabilitation) work	Number of structures affecting access for construction	Comments <sup>1</sup>
				construction work is from Ch 0.
Shivapura	2 religious structures	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0. 3.40 km encroached for cultivation. 0.44 km encroached by religious structure.
Hulugi	1 religious structure, 1 temporary building along service road and compound wall of religious structure at inspection path	No	Ch.2.00 to 2.45 km temple compound wall encroaching the embankment of inspection path 3.44 km encroached for cultivation.	Access is available from service road throughout the length of the channel with the exception of Ch.2.00 to 2.45 kms. Entry for construction work is from the Ch 0.
Upper Gangavathi	9 (1 religious structure 8 temporary building in inspection path)	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0. Ch.8.6 to 8.8 – 8 temporary houses on the IP. 2.24 km of IP encroached for cultivation
Lower Gangavathi	4 (2 abandoned building, 1 temporary cow shed and 1 religious structure)	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0. Ch.6.6 to 6.82 religious structure along the service road Ch.8.0 to 8.32, 1 religious structure, cow shed, and a damaged stone



Name of the Channel	Number of Structures	Any objection from farmers for modernization (rehabilitation) work	Number of structures affecting access for construction	Comments <sup>1</sup>
				structure on service road. Ch.9.0 to 9.08 brick kiln and small house along inspection path Ch.9.8 to 9.9,1 temporary house encroached on inspection path.
Siruguppa	21 permanent houses in inspection path and 1 religious structure along service road	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0.
Deshnur	1 permanent building and portion of small house along inspection path	No	No structures are affecting access for construction. Invariably the service roads are available for movement of vehicles, equipment and materials.	Access is available from SR throughout the length of the channel. Entry for construction work is from the Ch 0.
Bichal	1	No	Approach road needs to be constructed before starting the construction work	Approach road needs to be constructed before starting the construction work. 13.06 km of IP encroached for cultivation. Besides the service road also encroached for cultivation.

\*\*Structures are divided into permanent, semi-permanent, temporary houses, religious structures, Govt. Offices etc.

22. As explained above, there is adequate access available for movement of vehicles, equipment and transfer of construction materials to the channel sites through the existing service road or panchayat road along the embankment of the channel. However, on the inspection path, farmers are making use of the land for cultivation of seasonal crops. Some of the areas are partially encroached by private structure; such areas are denoted on the strip maps. The field assessment revealed that around 75% of the service road is available for modernization (rehabilitation) work while the remaining stretch is partially encroached (mostly by the adjacent farming people) with cultivation of seasonal crops. In some of the stretches, encroachment by people is for residential purposes and for animal shed. In a few places (especially in Bella Channel), the Gram panchayat has given permission to construct houses in the vacant government land. However, this will not

affect accessibility to construction sites since both alternative roads are available for the movement of vehicles, construction equipment and materials. Besides, project implementation neither requires permanent acquisition of land nor involves physical displacement of infrastructure or household. Before beginning construction, consultations with WUCS, Panchayats, municipality and local farmers will be conducted prior to execution of work specifically in case of inaccessible sites for which access from farmer fields/private land may be necessary. Farmers who are willing to vacate the encroachments will be provided their preferred time for withdrawal. This will ensure that farmers prepare a plan for harvesting. KNNL has the primary responsibility for ensuring that all temporary land access is documented and verified by a third-party witness. KNNL must also report of agreements made between the farmers and contractors within the Safeguard Monitoring Report which is submitted to ADB on a bi-annual basis.

### Construction Methodology

23. **Annexure 1** provides construction methodology and guidelines for the project in terms of access for equipment, men and machinery to move around with relative ease in the construction area. Further, the construction methodology also examines environmental and social aspects, including for aquatic and animal life forms, and suggests measures for accommodating those needs during construction.
24. For social safeguards, surveys have been conducted kilometre wise along all the 16 channels of the Vijayanagara project and strip maps prepared. The strip maps provide information on accessibility to the anicut, conditions of service road and parallel roads available, inspection path, infrastructure such as houses (permanent, semi-permanent, temporary, cow sheds, toilets, commercial establishments, religious institutions, crops, vegetations, trees etc. Accessibility to channels from the service road (and parallel roads) and inspection paths have also been explored. As a standard practice, KNNL has a service road of 3.5 to 4 meters, and inspection path of 2.75 meters on two sides of the canal. Besides, there are bridges in many localities connecting service road and the inspection path. Entry to the channel for vehicles, equipment and materials will be from "0" chainage and goes on hindered throughout the length of the canal. Materials will be provided from accessible points at different locations depending upon the requirement. Specified locations shall be finalised by the contractors, KNNL and PSC before starting the construction work, including construction camps. Consultations with WUCS, Panchayats, municipality and local farmers will also be conducted simultaneously – these consultations will be verified and documented through written and photographic evidence - as and when necessary for generating consensus. In some stretches of four channels, there are urban areas. In all the four channels, KNNL land along the service road is encroached for dwellings and cow sheds and invariably the inspection paths are used for cultivation by the farmers. During surveys, people readily expressed their willingness to vacate the occupied land for modernization (rehabilitation) work. In a few cases, the channel sections and anicuts are not accessible for short distances. In such places, construction of approach roads and ramps will be proposed. Once the ramp/ approach road is constructed, Contractor can move the necessary equipment and carryout rehabilitation works. The approach road and ramps need to be removed after the construction work to avoid poaching of animals, mining and other unwanted activities by miscreants. Farmers willingness to accommodate temporary land access will be

documented through a validated consent form. The contractor will provide validated consent forms to the PIO who is responsible for monitoring and reporting on temporary land access to ADB.

25. The VNC project proposed under Tranche 2 is classified as Category “C” project as per ADB safeguards policy. However, during implementation of infrastructure works, the project requires compliance with ADB’s safeguards requirements on involuntary resettlement (IR), adhering to Indian laws and policies, to ensure that the project follows all safeguard requirements, and that no one is disadvantaged in the process of development.

## E. CONCLUSION AND RECOMMENDATIONS

26. After reviewing the information on land area, it is clear that the VNC project will not result in any land acquisition. No family is required to be resettled. All temporary impacts will also be avoided as per the suggested mitigation measures. Although the project areas are inhabited by different ethnic groups, no significant differences in cultural and socio-economic identity exists among the different language groups, and no specific adverse impacts are anticipated to warrant separate indigenous peoples' plans. Since the project will not require acquisition of any land and/ or any form of physical or economical displacement of any household, it is classified as Category "C" as per ADB safeguard policy requirement. Due to change in National and State rules and policies related to land acquisition and resettlement, the Resettlement Framework has been updated.
27. It is concluded from this due diligence study that the proposed modernization (rehabilitation) work will not change significantly the present land use pattern; there will be no issues of land acquisition and resettlement related to this project. All facilities will be built on vacant government land. Where farmers have encroached land, they have expressed their readiness to vacate the land at the time of execution of works in those stretches, with allowance for next harvest. Due to project interventions, there will be no loss of income for any person or loss of any asset, either privately owned or publicly owned. If any claims or complaints are submitted during the construction period, an effective and efficient **Grievance Redressal Mechanism** should be established and resourced (as required by the Resettlement framework) which will ensure provision of timely consultations and arrival at appropriate solutions. The arrangement of a Grievance Redressal Mechanism shall be disseminated widely including in the public consultations with farmers and community leaders. A complaint register will be also maintained at KNNL section offices, construction site and at Gram panchayat offices as well.
28. In sum, the due diligence study confirms that interventions proposed as part of modernization (rehabilitation) will not result in any adverse social impacts. Before starting the construction works, KNNL/Contractor needs to carry out rapid situation assessment of inspection path in each of the channels and come out with a workable plan in consultation with the occupants of encroached areas. Farmers will be provided advance notice of temporary land access so that they can plan and harvest their crop before works commence on those stretches of the canals. **The findings of this social due diligence study indicate that the project is unlikely to result in any involuntary physical and/or economic displacement.**

## Construction Methodology and Guidelines for Rehabilitation of Anicuts and Canals

This section provides a broad framework of construction methodology and guidelines to be adopted for modernization (rehabilitation) works on anicuts and channels of Vijayanagara Irrigation System. The framework deals with access for wo/men, construction equipment and vehicles to move around with relative ease without causing disruption to physical or economic assets, including assets situated on private or public land. Further, the construction methodology also examines environmental and social aspects, including for aquatic and animal life forms and temporary land access. The construction methodology suggests measures for accommodating those needs during rehabilitation.

For preparing strip maps, surveys have been conducted kilometre-wise along all the 16 channels of the Vijayanagara project. Data related to social and environmental assets covering crops, cattle sheds, washing areas, shelters/houses, institutions, religious structures, pump houses, and so on was collected in strip maps<sup>2</sup>. The strip maps indicate how the contractors will access the anicut, the conditions of the service road and parallel roads available, inspection paths, infrastructure such as houses (permanent, semi-permanent, temporary, cow sheds, toilets, commercial establishments, religious institutions, crops, vegetations, trees etc. Accessibility to channels from the service road (and parallel roads) and inspection paths. The purpose of the strip maps is to ensure that environmental and social impacts are avoided and minimized when necessary.

The contractors will avoid environmental and social impacts by making use of the available infrastructure owned by KNNL. As a standard practice, KNNL has a service road of 3.5 to 4 meters with a one-meter berm on either side, and inspection path (IP) of 2.75 meters on either side of the channels. KNNL also have bridges in many localities connecting service road and the inspection paths. The SDDR finds that contractors will be able to gain access to the channels using public roads, service roads, inspection paths or through temporary ramps in deep cut sections (ramps to be installed by the contractor on government land). Alternatively, access to the channel can be from the "0" chainage. Materials will be provided from accessible points at different locations depending upon the requirement. Specified locations for transport of materials shall be finalised by the contractors, KNNL and PSC before starting the construction work – the contractors will ensure that all temporary land access follows procedures laid out in the construction guidelines and will be documented and verified. Consultations with WUCS, Panchayats, municipality and local farmers will be conducted prior to execution of work specifically in case of inaccessible sites for which access from farmer fields/private land may be necessary. Some stretches along four channels (Raya, Basavanna, Gangavathi, Kampli and Siruguppa) pass through urban areas. In all these four channels, KNNL land along the service road is encroached for dwelling and cow sheds. The contractors cannot disrupt these encroachments and/or squatters and will identify access to the channels where populations are not inhabiting the embankment.

The VNC project proposed under Tranche 2 is classified as Category "C" project as per ADB safeguards policy. KNNL have commit to ensuring that no involuntary resettlement impacts

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<sup>2</sup> Strip Maps of all the channels of VNC are attached to the EIA report.

will occur in the Trance 2, as such, there will be no temporary or permanent involuntary physical or economic displacements. KNNL have the primary responsibility for ensuring that contractors comply with the approach taken, and for ensuring that documentation and verification is monitored and reported to ADB within the Safeguard Monitoring Reports. If the project triggers ADB's safeguard on involuntary resettlement (IR), KNNL will ensure that resettlement plans are drafted (as per the resettlement framework) and that all involuntary resettlement activities adhere to Indian laws and policies. KNNL are committed to implementing the ADB social safeguard policies to ensure that no one is disadvantaged in the process of development.

Table 1 below provides likely site issues, impacts to be addressed, and guidelines to address those impacts.

**Table 1: Site Issues, Likely Impacts and Guidelines**

**a. Construction Guidelines on Construction Worker Camps**

Site Issue	Impacts to be addressed	Guidelines to address impacts
<p>Construction Worker Camps will be required for civil works materials</p> <p>Construction camps sites should have adequate space for vehicle parking, storage of materials including construction of batching plants</p> <p>Contractors need to obtain necessary permission from the local authorities and Karnataka State Pollution Control Board before setting up the construction camps</p> <p>Following sites should be avoided</p> <ul style="list-style-type: none"> <li>• Lands close to habitations</li> <li>• Lands belonging to small farmers</li> <li>• Lands within 100m of community water bodies and other water sources such as tanks, rivers</li> <li>• Irrigated agricultural lands</li> <li>• Lands supporting dense vegetation and Forest with/without conservations status</li> <li>• Lands where there is no willingness of the</li> </ul>	<p>The influx of migrant labour will have both positive and negative impacts on the nearby community and local environment.</p> <p>The labour will be accommodated in temporary comfortable campsite within the project boundary which can have significant interface with the nearby community.</p> <p>The increase in migrant labourers will affect the local resources such as fuel, wood, water etc.</p> <p>Some local economic benefits are also envisaged due to the purchase of ration for these people from the local markets</p>	<p>Contractors need to obtain necessary permission from the local authorities and Karnataka State Pollution Control Board before setting up the construction camps.</p> <p>On identification of the land the Contractor shall submit to PIO the following:</p> <ul style="list-style-type: none"> <li>• Copy of the land records duly signed by the local revenue official</li> <li>• Written No-objection certificate of the owner</li> <li>• Extent of land required and duration of the use</li> <li>• Photograph of the site in original condition</li> <li>• Activities to be carried out in the site;</li> <li>• Environmental mitigation measures to be undertaken to prevent land, air, water and noise pollution;</li> <li>• Facilities which would be provided in the camp should also be provided on the layout map;</li> <li>• Detailed layout plan for development of the construction and labour camp that shall indicate the various structures to be constructed in the camp</li> </ul>

Site Issue	Impacts to be addressed	Guidelines to address impacts
<p>landowner to permit its use</p> <ul style="list-style-type: none"> <li>• Grazing lands and lands with or without tenure rights</li> <li>• Low lying lands</li> </ul>		<p>including temporary, drainage and other facilities</p> <ul style="list-style-type: none"> <li>• Proposal of site redevelopment after completion</li> <li>• Opening and maintenance of registers indicating the details of workers</li> <li>• Identity cards/labour cards to be issued to workers</li> <li>• Health check-up cards</li> </ul>

**b. Construction Guidelines on Access to Service Road and Inspection Path**

Site Issue	Impacts to be addressed	Guidelines to address impacts
<p>Temporary Vehicle and Equipment access to entire canal section in each of the channels is necessary to carry out the rehabilitation work</p>	<p>a) To ensure that environmental impacts such as dust pollution, air pollution and noise pollution are mitigated through appropriate measures.</p> <p>b) To ensure social safeguards in case that the movement of vehicles and equipment causes physical or economic displacement to titled and/or non-title holders. For example, access to the site may disrupt crops, infrastructure or people living on, or using, private or government land.</p>	<p><b>1. Overarching Principles</b></p> <p>a) Contractor must access the channel sections with pre-existing Service Road (SR), and/or Inspection Paths (IP).</p> <p>b) Follow standard guidelines to avoid dust, air and noise pollution.</p> <p>c) Contractors shall <i>avoid</i> disrupting any people or assets owned by people living along or on the SR, irrespective of whether these assets are on private or public (government) land. Assets include but are not limited to crops, houses, food gardens, temporary sheds, commercial units etc.</p> <p><b>2. If the SR or IP is inaccessible or blocked</b></p> <p>a) The contractors should check whether a ramp can be constructed along the SR or IP without disrupting assets or trespassing nearby lands, public or private, so that vehicles and equipment can reach the channel bed.</p> <p>b) Temporary ramps and such structures should be removed by the contractor immediately after the work/contract is completed to prevent misuse.</p> <p>c) If farmers have encroached the SR with their crops, the contractor shall seek consensus with concerned farmers to carry out rehabilitation works after harvesting. Agreements made with farmers must be documented and signed by the farmers and the contractor and witnessed by a third party. Signed agreements will be issued to KNNL and included in the Safeguard Monitoring Reports to ADB. A template is attached in the Resettlement Framework.</p> <p>d) If people or infrastructure are blocking the SR or IPs then the contractor will inform KNNL that squatters are present and a Resettlement Plan will be developed by the contractor as per the Resettlement Framework guidance.</p> <p><b>3. If access from the SR or IP - either directly or indirectly – is not possible.</b></p> <p>a) The contractor will identify an access route so that vehicles and equipment can be brought into the construction area for rehabilitating the channel sections as per design.</p> <p>b) If the new access road passes through sections that indicates presence of trees,</p>



		<p>conduct a tree survey, seek necessary approval from the Karnataka Forest Department and initiate ramp/ approach road construction as per KFD guidelines. Once the ramp/ approach road is constructed, move the necessary equipment and carryout the rehabilitation works.</p> <p>If the new access road passes through private land or affects any kind of infrastructure (house or shed etc.), then the contractor must seek consensus with concerned farmers to use their land to access the channel. The contractor can gain temporary access by choosing one of the following three options:</p> <ol style="list-style-type: none"> <li>1) <i>Voluntary Donation:</i> Farmers may willingly provide temporary access for construction works at no cost to the contractor. The contractor must follow guidance on Voluntary Donation included in the Resettlement Framework.</li> <li>2) <i>Negotiated Settlement:</i> The contractor may offer farmers compensation in the form of rent and/or other financial compensation to gain temporary access to land.</li> <li>3) <i>Involuntary Resettlement:</i> The contractor may need to need temporary access to land through involuntary means. In this case, the contractor will need to develop a resettlement plan and submit to KNNL. Guidance is provided in the Resettlement Framework.</li> </ol> <p>Note that all the three land access options must be documented and verified by a third-party witness Signed documentation must be issued to KNNL and included in the SMR to ADB. Guidance and templates are available in the Resettlement Framework. All land access costs are borne by the contractor. Land acquisition is not an option since the study reveals that there is no need for a resettlement framework.</p>
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### c. Construction Guidelines to Preserve Aquatic Biodiversity

Site Issue	Impacts to be addressed	Guidelines to address impacts
Presence of Aquatic Biodiversity near the anicut being rehabilitated	To ensure that the aquatic biodiversity is preserved while carrying out rehabilitation work	Update the baseline survey of the aquatic biodiversity within a 200 m zone of influence of the anicut being rehabilitated.
		Determine movements and regular activities of aquatic animals around the anicut area.
		Identify safe locations for construction of ring-bunds to create alternative habitation areas for the aquatic animals while facilitating the creation of dry construction area.
		Select location of ring-bund in consultation with the PSC/KNNL Biodiversity Expert and secure approval from the Karnataka Forest Department prior to the construction of ring-bund.
		Construct the ring-bund during the period December to June, between 9 am and 5 pm.
		Rehabilitate anicut during the period December to June, between 9 am and 5 pm. Any adverse impact on the aquatic biodiversity during the rehabilitation activity should be mitigated in consultation with the PSC/KNNL Biodiversity Expert and the Karnataka Forest Department.
		Adverse impacts can be mitigated by raising awareness by imparting training to site managers, contractors, sub-contractors, labour contractors, supervising officials etc. on brief history of the Vijayanagara <i>anicuts</i> and the channels, importance of wildlife, rare aquatic wild flora and fauna of <i>anicut</i> area, preventing conflict with wild fauna, how to protect them, how to handle crisis situation, how to rehabilitate the fauna in distress, keeping site area free from disturbance in morning and evenings, no cooking and littering of food and plastic, and use of improvised toilets.
		After rehabilitation of the anicut is completed, dismantle the ring-bund immediately.
		Conduct a post-rehabilitation survey of the aquatic biodiversity within a 200 m zone of influence of the anicut that has been rehabilitated.
Provide an analysis of the baseline and post-rehabilitation aquatic biodiversity survey in the periodic reports submitted to KNNL and ADB.		

**d. Construction Guidelines on access to Ring-Bund Location**

Site Issue	Impacts to be addressed	Guidelines to address impacts
<p>Ring-Bund construction for creating a dry construction area for rehabilitating the anicuts.</p>	<p>Ring bunds are located along the river to prevent entry of water into the anicut area thereby creating a dry construction area. Considering that the temporary ring-bund construction can affect the aquatic biodiversity, adequate mitigation measures should be implemented.</p>	<p>Based on the aquatic biodiversity survey, select the location for construction of ring bunds in consultation with the PSC/KNNL Biodiversity Expert and the Karnataka Forest Department.</p> <p>For selected ring bund location, determine the access points for vehicle, equipment and the construction materials.</p> <p>If direct access is available through any of the existing roads, then the ring bund construction should be initiated as per designs.</p> <p>If alternative approach roads are to be constructed (even temporarily), due procedures should be followed to ensure access to ring-bund location.</p> <p>Conduct a survey to determine the approach road alignment so that vehicle and equipment can be brought in to the construction area through the approach road both for anicut and ring bunds.</p> <p>If the approach road passes through sections that indicate presence of trees, conduct a tree survey, seek necessary approval from Karnataka Forest Department and initiate ramp construction as per KFD approved conditions. Once the approach road is constructed, move the necessary equipment to carry out ring bund construction.</p> <p>If farmers have encroached the access path with their crops, the contractor shall seek consensus with concerned farmers to carry out rehabilitation works after harvesting. Agreements made with farmers must be documented and signed by the farmers and the contractor and witnessed by a third party. Signed agreements will be issued to KNNL and included in the Safeguard Monitoring Reports to ADB. A template is provided in the Resettlement Framework.</p> <p>If either people or infrastructure are blocking the access path, then the contractor will alert KNNL and prepare a resettlement plan following guidance provided in the Resettlement Framework.</p> <p>If a new access road is created through private land or affects any kind of infrastructure (house or shed etc.), then the contractor must seek consensus with concerned farmers to use their land to access the channel. The contractor can gain temporary access by choosing one of the</p>

		<p>following three options:</p> <ol style="list-style-type: none"> <li>1) Voluntary Donation: farmers may willingly provide temporary access for construction works at no cost to the contractor. The contractor must follow guidance on Voluntary Donation included in the Resettlement Framework.</li> <li>2) Negotiated Settlement: the contractor may offer farmers compensation in the form of rent and/or other financial compensation to gain temporary land access.</li> <li>3) Involuntary Resettlement: the contractor may need to acquire temporary land access through involuntary means. In this case, the contractor will need to develop a resettlement plan and submit to KNNL. Guidance is provided in the Resettlement Framework.</li> </ol> <p>Note that all land access options must be documented and verified by a third-party witness. Signed documentation must be issued to KNNL and included in the SMR to ADB. Guidance and templates are available in the Resettlement Framework. All land access costs are borne by the contractor.</p> <p>Retain the approach road (if temporary) until the ring-bund is removed at the end of the rehabilitation of the anicut.</p>
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**e. Construction Guidelines on access to Anicut**

Site Issue	Impacts to be addressed	Guideline to address impacts
<p>Vehicle and Equipment access to the Anicut is necessary to carry out rehabilitation work</p>	<p>To ensure that social and environmental impacts are avoided, and if unavoidable, the impacts are mitigated while carrying out the rehabilitation work.</p>	<p>Check the possible alignment for accessing the anicut either from existing Service Road or Inspection Path or Approach Roads.</p> <p>Generally, anicuts are accessible from Service Road (SR) side. In situations where the anicut is not accessible for certain short distances a ramp may be constructed for movement of men and machinery to complete the ring bund and then construct the anicut.</p> <p>If anicut is not accessible from the SR or IP directly, check whether a ramp can be constructed along the SR or IR so that the men and machinery can reach the anicut without trespassing any land either encroached, public or private or does not indicate presence of trees. If yes, construct the ramp and move the necessary equipment to carryout rehabilitation works.</p> <p>If not, determine whether a nearby approach road can be used / constructed to carry out the rehabilitation works.</p> <p>If there is no access from the anicut either directly or indirectly, conduct a survey to determine the approach road alignment so that men and machinery can be brought to the construction area through the approach road both for constructing ring bund and for rehabilitating anicut as per the designs.</p> <p>If the ramp alignment section/ approach road passes through sections with presence of trees, conduct a tree survey, seek necessary approval from Karnataka Forest Department and initiate ramp construction as per KFD guidelines. Once the ramp/ approach road is constructed, move necessary equipment to carryout rehabilitation works.</p> <p>If farmers have encroached the access path with their crops, the contractor shall seek consensus with concerned farmers to carry out rehabilitation works after harvesting. Agreements made with farmers must be documented and signed by the farmers and the contractor and witnessed by a third party. Signed agreements will be issued to KNNL and included in the Safeguard Monitoring Reports to ADB. A template is provided in the Resettlement Framework.</p> <p>If people or infrastructure are blocking the access path, then the contractor will alert KNNL and prepare a resettlement plan follow</p>

		<p>guidance provided in the Resettlement Framework.</p> <p>If the new access road passes through private land or affects any kind of infrastructure (house or shed etc.), then the contractor must seek consensus with concerned farmers to use their land to access the channel. The contractor can gain temporary access by choosing one of the following three options:</p> <ol style="list-style-type: none"> <li>1) <i>Voluntary Donation</i>: farmers may willingly provide temporary access for construction works at no cost to the contractor. The contractor must follow guidance on Voluntary Donation included in the Resettlement Framework.</li> <li>2) <i>Negotiated Settlement</i>: the contractor may offer farmers compensation in the form of rent and/or other financial compensation to gain temporary land access.</li> <li>3) <i>Involuntary Resettlement</i>: the contractor may need to acquire temporary land access through involuntary means. In this case, the contractor will need to develop a resettlement plan and submit to KNNL. Guidance is provided in the Resettlement Framework.</li> </ol> <p>Note that all land access options must be documented and verified by a third-party witness. Signed documentation must be issued to KNNL and included in the SMR to ADB. Guidance and templates are available in the Resettlement Framework. All land access costs are borne by the contractor.</p>
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***Annexure 2***  
**Strip Maps of Vijayanagara Channels**  
(separate file)