Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 31-Jan-2019 | Report No: PIDISDSA25760
## BASIC INFORMATION

### A. Basic Project Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Project ID</th>
<th>Project Name</th>
<th>Parent Project ID (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>P166977</td>
<td>Dam Rehabilitation &amp; Improvement Project - Restructuring and Additional Financing</td>
<td>P089985</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent Project Name</th>
<th>Region</th>
<th>Estimated Appraisal Date</th>
<th>Estimated Board Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN Dam Rehabilitation and Improvement Project</td>
<td>SOUTH ASIA</td>
<td>09-Aug-2018</td>
<td>28-Feb-2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practice Area (Lead)</th>
<th>Financing Instrument</th>
<th>Borrower(s)</th>
<th>Implementing Agency</th>
</tr>
</thead>
</table>

Proposed Development Objective(s) Parent

To improve the safety and operational performance of selected existing dams in the territory of the participating states. The PDO will be achieved through rehabilitation and improvement of dams and improvement in central and state-level institutional capacity to sustainably manage dam safety administration and operation and maintenance.
Components
- Rehabilitation and Improvement of Dams and Associated Appurtenances
- Dam Safety Institutional Strengthening
- Project Management

PROJECT FINANCING DATA (US$, Millions)

**SUMMARY**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Project Cost</td>
<td>113.56</td>
</tr>
<tr>
<td>Total Financing</td>
<td>201.06</td>
</tr>
<tr>
<td>of which IBRD/IDA</td>
<td>137.00</td>
</tr>
<tr>
<td>Financing Gap</td>
<td>-87.50</td>
</tr>
</tbody>
</table>

**DETAILS**

**World Bank Group Financing**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Bank for Reconstruction and Development (IBRD)</td>
<td>137.00</td>
</tr>
</tbody>
</table>

**Non-World Bank Group Financing**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterpart Funding</td>
<td>64.06</td>
</tr>
<tr>
<td>Borrowing Agency</td>
<td>64.06</td>
</tr>
</tbody>
</table>

Environmental Assessment Category
- A-Full Assessment

Decision
- The review did authorize the team to appraise and negotiate

B. Introduction and Context

Country and Sectoral Context

1. Water resources development is a key focus area for the Government of India (GoI) and state...
governments in the country, given increasing water scarcity and the rising competing demands. India is home to some of the world’s most sizeable river diversion infrastructure, and ranks third after China and the United States in terms of the number of dams. These dams have played a key role in fostering sustainable growth in the agricultural and rural economy, which are development priorities for the GoI. Irrigated agriculture has been a major pillar of the government’s strategy to improve livelihoods and to ensure food security.

2. In India, rainfall occurs mainly in intense and unpredictable downpours during short monsoon seasons. As a result of this high temporal and spatial variability, rainfall cannot meet the needs of year-round irrigation and other water demands. In addition, climate change induced impacts on meteorological parameters are likely to compound the issue of water availability. Over the last 65 years, India has invested heavily in infrastructure to store surface runoff in reservoirs formed by large, medium, and small dams with associated appurtenances. According to the National Register for Large Dam (NRLD 2018), there were about 5,264 completed large dams in India, with another 437 under construction. The total storage capacity of these dams is about 304 billion cubic meters. The reservoirs formed by large dams are either single- or multi-purpose, including water supply, power generation, flood control, irrigation, and/or recreation. Most of these dams were constructed and are maintained by state governments through their irrigation and water resources departments. A few are owned and operated by central and state public entities. India is also home to tens of thousands of medium and small dams that have been constructed and are maintained by various agencies.

3. As a result of population growth and development in downstream areas of dams, the potential damage as a result of catastrophic flooding has increased significantly. Existing flood protection measures are often below acceptable standards, causing serious risks. An ever-increasing number of people are living and working in areas that would face sudden and severe flooding in the event of a dam failure. In rural areas, the property at risk is affected by increasing values of buildings, irrigation and drainage facilities, and other infrastructure. Similarly, in urban areas, the value of property, buildings, and infrastructure at risk has also significantly increased and will continue to increase due to urban agglomeration, economic growth, industrialization and climate change.

4. Additionally, there has been minimal investment in extensive O&M of structures since dam construction and commissioning. Many existing dams are ageing (605 dams are over 50 years old and another 3095 dams are over 25 years old) and have various structural deficiencies as well as shortcomings in operation and monitoring facilities. In most states, budgets for dam O&M are part of the larger budget for irrigation system maintenance. This budget is typically decided on the basis of the total irrigated area rather than on preventative and scheduled maintenance needs. In practice, irrigation canal maintenance tends to be prioritized over dam maintenance, which has led to deterioration of various dam structures. Allocations for O&M should be more in line with need-based assessments and India is beginning to adopt modern

---

1 The International Commission on Large Dams (ICOLD) defines a large dam as a dam with a height of 15 m or greater from lowest foundation to crest or a dam between 5 m and 15 m impounding more than 3 million m³.
asset management planning to guide this process. Most large dams are considered ‘high-hazard’.

5. High safety standards for large dams are imperative to prevent failure that would cause devastating damage to environment and property, which could then lead to economic hardship, and, in extreme cases, loss of life. Structural integrity and safety are necessary to reduce risks and help assure sustainability and full operational capacity of existing storage through early identification and resolution of problems. Action is required to: (i) ensure rehabilitation and modernization of dams to bring them back to acceptable standards of safety and operation; (ii) develop and implement adequate O&M programs; (iii) ensure regular review of safety at dams, both by operator and independent review panels; and (iv) formulate standards, guidelines and asset management systems to minimize future risks of dam failures.

6. GoI is cognizant of the need for large-scale renovation of the country’s dams, and since 2010 has been implementing the World Bank-supported Dam Rehabilitation and Improvement Project (DRIP) to begin to address dam safety concerns. With support from DRIP, the Central Water Commission (CWC), which has oversight on the national level for dams, has recently developed the Dam Health and Rehabilitation Monitoring Application (DHARMA) tool and introduced seven new dam safety guidelines aimed at helping the country focus on dam rehabilitation using a variety of best practices.

7. In addition, CWC has prepared a comprehensive National Dam Safety Act (first drafted in 2002, updated in 2008 and 2016), which has been recently approved by the Cabinet. The same will be presented in the coming Parliament session for approval. All states with Dam Safety Organizations (DSOs) are already in general compliance with the provisions outlined in the draft Dam Safety Act, including regular inspections of all large dams and functional independent Dam Safety Review Panels (DSRP). All DRIP implementing states have established DSOs except for the state of Karnataka, where the DSO is being established as part of DRIP implementation.

8. Given the large number of dams in India, DRIP has acted as a lighthouse, showcasing the process of returning dams to a fully operational state and to ensure safer conditions in a technically sound and financially sustainable manner. In addition to this it has been building much needed capacity for monitoring the performance of dams.

9. The current climate risk profile for DRIP sub-projects/activities has identified the following climate change-related risks: overtopping of the dam; downstream inundation; and gate as well as structural failure of the dam due to sudden inflow of high quantum of water due to cloud burst (in the Himalayan region) or tropical cyclonic rainfall (peninsular India). The activities

---

2 High-hazard is a term used by a majority of dam safety programs. While the definition varies slightly from place to place, in India it generally refers to a substantial potential loss of life and high property damage if failure of a high-hazard dam occurs.
proposed to be carried out under AF are designed to reduce these climate change induced risks and rehabilitate the selected dams to fully safe and operation conditions.

10. The MoWR, RD&GR through the Department of Economic Affairs, Government of India, has requested an IBRD loan for Additional Financing (AF) of US$137 million out of the total project requirement of US$ 201 million. Based on the results of studies carried out early in project implementation, the construction and contracting plans and detailed dam-wise cost estimates were prepared by the IAs. These plans included several activities that were not envisaged in the original project design. This resulted in slow progress in the initial three years of the project, in addition to increased costs and time overruns. The pace of project implementation and rehabilitation activities in all DRIP dams has increased incrementally from the fourth year, due in large part to the greater capacity of IAs and their ability to overcome initial hindrances in contracting. However, a few critical activities still need to be undertaken to ensure satisfactory achievement of the Project Development Objectives (PDO). Thus, AF is required to undertake additional activities as well as to complete ongoing activities required to meet the project objectives.

C. Proposed Development Objective(s)

11. The original PDO is to improve the safety and operational performance of selected existing dams in the territory of the of the participating states.

12. Proposed PDO for Additional Financing: No change from the original PDO.

Key Results

13. The PDO will be achieved through rehabilitation and improvement of dams and improvement in central and state-level institutional capacity to sustainably manage dam safety administration and operation and maintenance. Key performance indicators to measure the achievement of the PDO include:

- Number of project dams with: (i) the ability to safely cater for design floods; and (ii) acceptable stability and seepage. Dams are thus returned to full operational conditions, with reduced risk of failure;
- Number of project dams with need-based O&M plans operationalized. Specific measurements to measure this indicator include availability of detailed operation and maintenance manuals, regular inspections, and development of information technology and analytical tools to generate, collect, evaluate, monitor, and disseminate data on dam safety and operations;
- Number of project dams with basic dam safety facilities in place;
- Percentage of required budget per state for adequate O&M of dams; and
- Number of project dams where emergency response plans have been prepared and disseminated to the population.
D. Project Description

14. The original DRIP had three components:
   a. *Rehabilitation and Improvement of Dams and Associated Appurtenances*, DRIP is financing the rehabilitation of 223 project dams, many of which are more than 25 years old and for which the current risk profile with respect to climate change induced impacts is also a matter of significant concern. The ongoing interventions include: treatment of leakage through masonry and concrete dams and reduction of seepage through earth dams; improving dam drainage rehabilitation and improvement of spillways, head regulators, draw-off gates and their operating mechanisms, stilling basins, and downstream spillway channels; improving approach roads; improving office and housing accommodation; and improving dam safety instrumentation. The project also supports hydrological assessments (including inflow assessment to understand the changes in the hydrological inflow regimes as well the futuristic flow in the light of climate change) and specialized consulting services to formulate strategy for long-term management of these changing hydrological regimes. In addition, preparation and implementation of asset management plans, dam-wise Emergency Action Plans (including long term action plans to mitigate climate change induced risks), emergency warning systems, public awareness campaigns and flood inundation mapping are ongoing in all participating states.

   b. *Dam Safety Institutional Strengthening*, focusing on regulatory and technical frameworks for dam safety assurance. The activities include customized training nationally and internationally to the Central Dam Safety Organizations (CDSO) and the State Dam Safety Organizations (SDSO); participate in dam safety courses; study tours, and linking with foreign agencies that have advanced dam safety programs such as the United States and Australia; development of Management Information Systems (MIS) and other programs to capture and analyze data for long-term planning including futuristic climate change scenarios and guiding of dam operations including the DHARMA tool; and training in hazard and vulnerability assessment and dam-break analysis.

   c. *Project Management*: Establishment and operation of project monitoring and management units at central (Central Project Management Unit – CPMU) and state (State Project Management Units – SPMUs) levels.

15. The additional financing in the form of an IBRD loan of US$137 million is to help finance the additional project costs. The largest part of these additional costs arose from design changes that, although anticipated at the time of the appraisal of the project, were only detailed during implementation through additional studies, and reflected safety enhancements recommended by various Dam Safety Review Panels. The AF is being processed alongside a project restructuring of the project due to the revision in the Environmental Category from “B” to “A”.

16. The details of the additional costs by component are described below:
i. **Component 1:** Rehabilitation and Improvement of Dams and Associated Appurtenances (additional cost $66.2 million), of which:

(a) **Hirakud Dam (US$58.5 million).** Hirakud Dam in Odisha is the longest dam in the world and the fourth largest dam in India in terms of capacity and has been part of DRIP since the project was conceived. A detailed investigation of the dam was carried out during project implementation and a comprehensive rehabilitation plan was developed in view of the increase of 27,182 m$^3$/s in revised design flood. This necessitated enhancement of spillway capacity and site investigations concluded that two spillways, one on the left bank and one on the right bank, need to be developed. Based on the findings of this detailed assessment, the construction of the left bank spillway was taken up on a priority basis and will be supported under DRIP along with the associated supervision and quality assessment works and related safety measures and studies.

In addition, following safety studies for Hirakud Dam are proposed to be taken up, viz.: (i) comprehensive hydrological assessment and flood routing simulation, hydro-met monitoring and flood forecasting with decision support system of the reservoir / spillway gate operation, flood management; (ii) a review of its existing structures and facilities, including the stability of the main dam and earthen dikes, spillway gates, as well as safety and resilience enhancement measures under extreme hydraulic/seismic loads; (iii) assessment and upgrading of the dam safety monitoring instruments; (iv) conducting a Hazard and Operability Study on the spillway gates /hoists and control systems; (v) undertaking Probable Failure Mode Analysis (PFMA) to identify and prioritize additional dam safety enhancements; (vi) developing a risk reduction profile (RRP); and (vii) technical consultancy for designing the right bank spillway.

(b) **Small-scale rehabilitation at other dams (US$7.7 million) as detailed in the Procurement Plan.**

ii. **Component 2:** Dam Safety Institutional Strengthening (additional cost $25.7 million). Additional funds for completing ongoing activities including strengthening of regulatory and technical frameworks for dam safety assurance; customized trainings (national and international) and participation in dam safety courses; study tours and linking with foreign country agencies that have advanced dam safety programs; training in hazard and vulnerability assessment and dam-break analysis; development of emergency action plans, O&M manuals for each dam; and assessment and upgrading of the dam safety monitoring instruments. The component will also support studies of climate-change-induced risk in dam safety and management and development of strategies to mitigate these risks and Probable Failure Mode Analysis for a few selected dams. The additional funds will also support technical assistance for the risk assessment of large dams in India including (a) development of a framework for safety-related risk assessment of large
dams in India and (b) preparation by CWC in collaboration with the states of a prioritized list of large dams at risk in India, based on the framework.

iii. **Component 3**: Project Management (additional cost US$ 21.6 million): Project management consultancies and the management and supervision of the project by the 7 project implementing agencies will require additional financing.

17. Table 1 summarizes the state-wise allocation of funds under the AF.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerala</td>
<td>28.7</td>
</tr>
<tr>
<td>Odisha</td>
<td>84.3</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>7.7</td>
</tr>
<tr>
<td>Karnataka</td>
<td>41.5</td>
</tr>
<tr>
<td>UJVNL</td>
<td>12.8</td>
</tr>
<tr>
<td>DVC</td>
<td>0.2</td>
</tr>
<tr>
<td>CWC</td>
<td>25.8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>201.0</strong></td>
</tr>
</tbody>
</table>

* Out of the total, World Bank will finance US$137 million

18. Project timeline. The original financing of DRIP as well as the proposed AF will close on June 29, 2020.

**E. Implementation**

**Institutional and Implementation Arrangements**

19. Given the complexity and nature of risks involved in the successful delivery of the PDO, multi-tiered implementation arrangements as described below were put in place.

20. The organizational structure for day-to-day project coordination and management of DRIP consists of a Project Management Unit (PMU) at the central level in the CWC and one state-level PMU for each of the nine state-level implementing agencies. All PMUs are staffed with qualified personnel, supplemented with consultants so that the needed technical, safeguard, monitoring and evaluation (M&E), and fiduciary (procurement and financial management) capacity is available. A multidisciplinary management and engineering consulting firm assists the CWC with the overall implementation of the project.

21. A multidisciplinary Dam Safety Review Panel (DSRP) has been constituted by the nine state-level IAs, with experts from various technical fields including hydrology, dam civil structural
works, and mechanical works including gates and instrumentation.

22. Implementation and Monitoring: The arrangements for implementation and monitoring described in the PAD will continue under the AF. Operators of dams, state design organizations, and engineering cells in WRDs and SEBs provide design services and day-to-day construction supervision. Consulting services for the more complicated design and third-party supervision services and specialized tasks are recruited to assist WRDs and SEBs, as needed. A National Level Steering Committee (NLSC) exercises oversight of dam safety assurance and rehabilitation and disaster management. The NLSC is headed by the Secretary MOWR, RD&GR and includes senior representatives from CWC and participating states. The NLSC addresses the policy matters supported under DRIP. A separate Technical Committee (TC) is also in place to address technical issues arising under DRIP as well as to provide technical inputs to the NLSC, coordinate with implementing committees of state governments, and review progress of development projects.

Implementation Status

23. DRIP was approved by the Board on June 29, 2010, and declared effective on April 18, 2012. The financing provided by the Bank consisted of an IBRD loan and an IDA credit of US$ 175 million each for a total of US$ 350 million. During the initial three years of implementation, the focus was on screening dams and preparing safety plans and their approval. In February-April 2014, the IDA credit and the IBRD loan were reduced by US$ 35.35 million each through a partial cancelation. This partial cancellation was carried out in part because of slow implementation of the project and the need to reallocate IDA resources to other projects, as well as to account for exchange rate fluctuation. The project scope did not change following the partial cancellation (hence, the partial cancellation created a financing gap of $87.5 million, including the associated Government contribution).

24. Over the past three years, physical implementation has accelerated, and the project has seen noteworthy progress in the awarding of capital works contracts, initiation of the remaining procurement packages, and a strong uptake in disbursements by all 10 IAs. As of December 2018, 702 contracts amounting to US$255 million were committed through awarded contracts. As of September 2018, the project had disbursed 75 percent of the total project amount. The IDA component of the funding (US$139.65 million) has been fully disbursed and the IBRD funding (US$139.65 million) is 50 percent disbursed (September 2018).

25. Progress has also been good in implementation of the institutional strengthening component. An annual training program focusing on various dam safety aspects including instrumentation, dam break analysis, asset management, project management and construction supervisory, and so on is under implementation. So far, 121 training programs (six international and 115 national) have been carried out, benefiting more than 3,900 central and state government officials. In addition, guidelines have been prepared for (a) dam instrumentation and monitoring and (b) dam safety operations after seismic events and five other selected topics relevant to dam safety and management.
26. Based on the significant achievement made in the progress of activities, currently the PDO and Implementation Progress are rated Moderately Satisfactory (MS) and Satisfactory (S), respectively.

27. The project is fully compliant with its legal covenants.

F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The project is implemented in the states of Kerala, Karnataka, Madhya Pradesh, Odisha, Uttrakhand, and Tamil Nadu as well as in Damodar Valley. A total of 223 existing large dams are targeted.

G. Environmental and Social Safeguards Specialists on the Team

Suryanarayana Satish, Social Specialist
Gopalaswamy Srijhari, Social Specialist
Pyush Dogra, Environmental Specialist

SAFEGUARD POLICIES THAT MIGHT APPLY

<table>
<thead>
<tr>
<th>Safeguard Policies</th>
<th>Triggered?</th>
<th>Explanation (Optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment OP/BP 4.01</td>
<td>Yes</td>
<td>No change from Original Project.</td>
</tr>
<tr>
<td>Performance Standards for Private Sector Activities OP/BP 4.03</td>
<td>No</td>
<td>No change from Original Project.</td>
</tr>
<tr>
<td>Natural Habitats OP/BP 4.04</td>
<td>Yes</td>
<td>While no endangered species are found in the project area, however, there maybe potential substantial loss of ecological functions provided by trees that will be cut during the construction process. the EMP has provision for afforestation and mitigation measures.</td>
</tr>
<tr>
<td>Forests OP/BP 4.36</td>
<td>Yes</td>
<td>Since construction of Additional Spillway at Hirakud Dam will involve diversion of 9.441 hectare of forest land. It will involve removal of around 3600 trees and a EMP will include afforestation of double the number of trees.</td>
</tr>
<tr>
<td>Pest Management OP 4.09</td>
<td>Yes</td>
<td>It is envisaged that no pesticide will be procured under the project and only chemical treatment which is a practice during forest management in</td>
</tr>
</tbody>
</table>
The sub-projects proposed under Additional Financing will have environmental impacts similar to the sub-projects financed under the Original Project (which are mainly related to construction period impacts, and are temporary and reversible in nature, such as disturbance to borrow areas, etc.). Except that an additional impact of the Hirakud sub-project will use 1.9 percent (9.41ha) of a degraded forest area (overall area of this degraded forest with mainly scrub and scanty vegetation is 490ha), and cutting down of 3,610 trees of which around 115 trees are within the said degraded forest area. However, there is no possibility of negative impact on the health and quality of the forests as the forest is already highly degraded and project EMP allows afforestation in the degraded area. The compensatory afforestation by the project will, in effect, improve the quality of this patch of forest. No wildlife, migratory birds and fish are expected to be impacted. The closest natural habitat or endemic bird area is more than 13km away with the areas in between populated by several villages. Therefore, additional financing phase of the project has been classified category "A" and an independent EIA has been undertaken for Hirakund Dam for additional spillway investment which has been cleared by the Bank. The EIA was disclosed in country on February 28, 2018 and updated version is now available on web sites of CWC (https://damsafety.in/) and Odisha Government (www.dowrodisha.gov.in).
The additional financing will also support studies of climate-change-induced risk in dam safety and management and development of strategies to mitigate these risks and Probable Failure Mode Analysis for a few selected dams. In addition, the additional funds will support technical assistance for the risk assessment of large dams in India including (a) development of a framework for safety-related risk assessment of large dams in India and (b) preparation by CWC in collaboration with the states of a prioritized list of large dams at risk in India, based on the framework. These studies and analysis will mainstream environmental and social risks and will be a tool to understand risks related to dams upfront. This will help to strengthen environmental and social risk profile and mitigation in the sector.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area: The project investments will improve the safety and operation of the project dams including revising design floods as per latest norms and standards. All the interventions ensure that structural or non-structural measures are in place to safely cater for the increased design floods and are expected to reduce the failure risk of dams. One of the key sub-projects under Additional Financing with significant future outlook is the construction of additional spillway at Hirakud Dam in Odisha, one of the oldest multi-purpose dams in the country. Constructed in 1957, it serves more than 30 million people and several towns, cities and villages. The spillway aims at ensuring the safety of the dams and the surrounding environ which will prevent possibility of huge human and economic losses, especially as there are about 3 million people living downstream of this dam. Possible, but not likely negative induced impacts may involve increase in downstream population as agriculture is further intensified, which may additionally lead to disturbance of the coastal geomorphological processes (and consequent erosion and accretion). While the first set of issues related to population density will need to be managed by long-term land use planning processes, the coast and shoreline will be managed through the shoreline management plans and coastal zone management plans currently being developed by the Government of Odisha.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts. In case of the Hirakud sub-project under the Additional Financing, alternatives were considered from safety, technical, social and environmental parameters. These included options of either raising the height of existing dam, construction of additional spillways on left and right bank dykes, lowering the spillway crest, etc., following which the most suitable option was chosen. As for other civil works such as construction of new dam related office infrastructure, adverse impacts have been minimized by utilizing available government land or department land. Screening undertaken confirmed that these sites are free from encumbrances, and protected ecological resources.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

The ESMF prepared for the original project described the possible environmental and social impacts for each of expected rehabilitation activities. It provided templates to identify environment and social (E&S) impacts of each activity and their components; categorize them into A, B, C based on nature and magnitude of impact (significant, moderate and less significant respectively); and identify mitigation measures for preparation of mitigation plans. The ESMF detailed responsibilities of entities for implementation and monitoring of the proposed mitigation measures. Based on the screening criteria described in the ESMF, proposed activities under each dam have been categorized depending on sensitivity of the intervention required. A template for each dam summarizes the information collected during investigations as well as during the initial design of the interventions along with environmental and social aspects. The State Project Management Unit (SPMU) carried out screening using each template, before submission to the Central PMU (CPMU) in the Central Water Commission – the main implementing agency. The Bank Task Team received and reviewed each template. Based on review of these templates, a final categorization of each of the dams was made. The categories are C -- no environmental and social issues nor technical issues, and designs can be
The World Bank
Dam Rehabilitation & Improvement Project - Additional Financing and Restructuring (P166977)

finalized and tendered immediately; B -- requiring a brief dam-specific EMP and RAP to be prepared by the concerned state implementing agency and approved by the SPMU before the start of the works; and A -- requiring a well-defined EMP and RAP (and TDP) before implementation, prepared by the concerned state implementing agency. The respective State Implementing Agencies would be responsible to prepare these plans with assistance of consultants, as needed and with approval to be provided by the CPMU and the World Bank. The EMP will become part of the civil works contract and has to be adhered to and costed by the contractor. While no tribal communities (indigenous people) have been identified to be affected by project activities, in the event that a specific dam taken up under the project does affect tribal communities (indigenous people), the ESMF describes the processes to be followed in preparation of an Indigenous People Development Plan. The ESMF envisaged environmental and social capacity building at various levels to make sure that all staff involved in the project is aware of the ESMF and how to address environmental and social issues for each dam.

Since, from the ESMF screening perspective, Hirakund dam involves significant impacts on the social safeguard end, a detailed EA and EMP and Resettlement Action Plan (RAP) has been prepared. The Construction of the spillway and implementation of the RAP at Hirakud would be one of the key sub projects under the AFP. In order to address this involuntary resettlement, a Resettlement Action Plan (RAP) has been prepared. The RAP has been quite unique as none of the 3,022 persons have land title and hence considered ‘squatters’. The RAP has been approved by the World Bank. Key indicators to monitor RAP implementation include: PAPs choosing cash vs housing, development of infrastructure at resettlement sites, timely provision of payment in installments to PAPs relocating to new resettlement sites prior to civil works, provision of assistance measure of INR 25,000/- to female headed households, provision of trainings for income enhancement, etc. RAP also encompasses plans for labor influx management, GBV and community health and safety measures. In addition, it also provides for a SEMP to be prepared by the contractor (CESMP) before commencing the construction. Institutional and implementation arrangements for executing RAP have been worked out separately. To take care of the issue of diversion of 9.41ha of degraded forest land (and felling of 115 trees within this tract of forest), compensatory afforestation will be done covering the remaining part of the 490ha of forest to improve its health and quality. To compensate for the loss of 3,595 trees elsewhere in non-forest areas, the project will plant a large number of trees(double approx.). All other environmental issues (mainly during construction period) will be taken care by full implementation of the EMP.

Implementation experience of the ESMF provisions and related processes under the original project thus far are as follows: i) Project Screening Templates (PST) including E&S aspects have been diligently filled along with categorization of respective components; ii) such screening and categorizing enabled to identify the major E&S impacts at Hirakud Dam and led to preparation of mitigation plans – EMP and RAP; iii) as provided in ESMF, Project Management Consultants supporting CPMU (CWC) conducted some training programs on the ESMF for the benefit of nodal officers within the SPMU to enhance their capacity, though more training is needed; iv) while the PMC supporting the CPMU (CWC) has E&S specialists, their monitoring and reporting has not been periodic; v) State level IAs do not have any specific person designated or appointed to manage E&S aspects.

Hence in light of the above, the implementation arrangements for the Additional Financing have been further strengthened by: i) appointing or designating one or more officers’ familiar with E&S issues as part of the M&E cell within the SPMU, who will review the screening forms, RAPs and EMPs, and other related documents, and monitor compliance with the agreed actions. Comprehensive training on ESMF implementation, monitoring and reporting requirements, would be provided; ii) ensuring detailed progress review by PMC’s E&S specialists through increased site visit based reporting; iii) adding relevant clauses on migrant labor and ESHS requirements within contract bid documents and by providing detailed reporting formats; iv) the Bank team will assist IAs having major works, by conducting another round of intensive training on the ESMF provisions, followed by periodic refresher trainings. It will
also undertake site visits to review activities such as implementation of RAP at Hirakud and other mitigation measures at other locations.

The ESMF has been updated for use in Additional Financing works, based on implementation experience of the original project and also incorporating: (a) the latest legal and policy developments relating to land and R&R and provisions relating to labor influx and gender based violence in accordance with bank requirements; (b) additional guidance for impacts on forests; and (c) workers' safety and work zone safety, and consequent guidelines for incorporation of appropriate provisions in contract documents.

In addition the TA component which will bring out environmental and social risks upfront will help borrower to strengthen capacity from environmental and social perspective.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The original ESMF was prepared and disclosed in each state. The ESMF has now been updated, revised and approved by CWC, has been disclosed in IA’s websites and World Bank. In addition, the specific mitigation plans – EMP and RAP that have been prepared for Hirakud Dam, Orissa has been uploaded onto the websites of CWC, DoWR and World Bank, besides their disclosure locally within the project area. Mechanisms for continued consultations have been detailed in the RAP wherein PAPs and affected communities will be consulted through RAP implementation period on all aspects such as provision of entitlements, physical relocation, livelihood restoration, etc.

Further, during project implementation, the farmers in the command areas of the dams will be informed of alterations, if any, in the irrigation delivery schedule on account of the rehabilitation works. Populations living downstream of dams will be made adequately aware of the Emergency Response Plans prepared for specific dams, including their own responsibilities in this regard vis a vis those of the dam management and local authorities. Under the original project, Emergency Action Plans were prepared for 26 dams in accordance with guidelines issued by CPMU – CWC, besides in case of Krishnagiri Dam, community level consultations were held on the draft EAP. Several brochures, pamphlets, posters and videos depicting activities under DRIP as well as dam safety aspects are being prepared by CPMU for wider circulation to all stakeholders and general public for awareness. Several workshops have been conducted in Odisha, Uttarakhand and Kerala for local communities and students. Such activities would continue and also will be scaled up under the Additional Financing.

B. Disclosure Requirements (N.B. The sections below appear only if corresponding safeguard policy is triggered)

<table>
<thead>
<tr>
<th>Environmental Assessment/Audit/Management Plan/Other</th>
<th>Date of receipt by the Bank</th>
<th>Date of submission for disclosure</th>
<th>For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28-Feb-2018</td>
<td>28-Feb-2018</td>
<td>18-Jul-2018</td>
</tr>
</tbody>
</table>

"In country" Disclosure
India 28-Feb-2018

Comments
Revised document have been subsequently disclosed.

<table>
<thead>
<tr>
<th>Resettlement Action Plan/Framework/Policy Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date of receipt by the Bank</strong></td>
</tr>
<tr>
<td>28-Feb-2018</td>
</tr>
</tbody>
</table>

"In country" Disclosure
India 28-Feb-2018
Comments
Revised document have been subsequently disclosed.

<table>
<thead>
<tr>
<th>Indigenous Peoples Development Plan/Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date of receipt by the Bank</strong></td>
</tr>
<tr>
<td>28-Feb-2018</td>
</tr>
</tbody>
</table>

"In country" Disclosure
India 28-Feb-2018
Comments
Revised document have been subsequently disclosed.

<table>
<thead>
<tr>
<th>Pest Management Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Was the document disclosed prior to appraisal?</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

"In country" Disclosure
India 28-Feb-2018
Comments
Revised document have been subsequently disclosed.
If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.
If in-country disclosure of any of the above documents is not expected, please explain why:

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting) (N.B. The sections below appear only if corresponding safeguard policy is triggered)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?
Yes
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?
Yes
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?
Yes

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?
No
If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?
Yes

OP 4.09 - Pest Management

Does the EA adequately address the pest management issues?
Yes
Is a separate PMP required?
No
If yes, has the PMP been reviewed and approved by a safeguards specialist or PM? Are PMP requirements included in project design? If yes, does the project team include a Pest Management Specialist?
NA

OP/BP 4.11 - Physical Cultural Resources

Does the EA include adequate measures related to cultural property?
Yes
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?
OP/BP 4.10 - Indigenous Peoples

Has a separate Indigenous Peoples Plan/Planning Framework (as appropriate) been prepared in consultation with affected Indigenous Peoples?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes
If the whole project is designed to benefit IP, has the design been reviewed and approved by the Regional Social Development Unit or Practice Manager?
NA

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes
Is physical displacement/relocation expected?
Yes
Provide estimated number of people to be affected 3,022
Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods)
No

OP/BP 4.36 - Forests

Has the sector-wide analysis of policy and institutional issues and constraints been carried out?
No
Does the project design include satisfactory measures to overcome these constraints?
No
Does the project finance commercial harvesting, and if so, does it include provisions for certification system?
No

OP/BP 4.37 - Safety of Dams

Have dam safety plans been prepared?
Yes
Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?
Yes
Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?
Yes
OP 7.50 - Projects on International Waterways

Have the other riparians been notified of the project?
No

If the project falls under one of the exceptions to the notification requirement, has this been cleared with the Legal Department, and the memo to the RVP prepared and sent?
Yes

Has the RVP approved such an exception?
Yes

The World Bank Policy on Disclosure of Information

Have relevant safeguard policies documents been sent to the World Bank for disclosure?
Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?
Yes

All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?
Yes

Have costs related to safeguard policy measures been included in the project cost?
Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?
Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?
Yes

CONTACT POINT

World Bank

Chabungbam Rajagopal Singh
Sr Water Resources Mgmt. Spec.

Borrower/Client/Recipient
Department of Economic Affairs
Sameer Kumar Khare
Joint Secretary
jsmi-dea@nic.in

Madhya Pradesh Water Resources Department

Central Water Commission under Ministry of Water Resources, River Development and Ganga Rejuvenation

Damodar Valley Corporation (DVC)

Karnataka Water Resources Development Organisation

Kerala State Electricity Board

Kerala Water Resources Department

Odisha Water Resource Department

Tamil Nadu Water Resources Department
TANGEDCO Tamil Nadu

Uttarakhand Jal Vidyut Nigam Limited

**Implementing Agencies**

Central Water Commission under the Ministry of Water Resources  
Pramod Narayan  
Project Director  
dir-drip-cwc@nic.in

Damodar Valley Corporation (DVC)  
S. M. Bali  
Dy. Chief Engineer (Civil)  
salil.bali@dvc.gov.in

Uttarakhand Jal Vidyut Nigam Limited  
Sanjeev Lohani  
DGM  
dgm pcmgv@gmail.com

Odisha Water Resource Department  
A. K. Das  
Director  
akdas61@gmail.com

Tamil Nadu Water Resources Department  
T Asokan  
Chief Engineer  
ceomwro@gmail.com

Kerala State Electricity Board  
Babu Raj O  
Dy. Chief Engineer  
dirroplm2@gmail.com

Karnataka Water Resources Development Organisation
Madhava Madhava  
Project Director  
superengrmande@yahoo.co.in

Madhya Pradesh Water Resources Department  
Bharat Gosavi  
Nodal Officer  
encbodhi@gmail.com

TANGEDCO Tamil Nadu  
S. Siluvai Angela Macqueen  
Superintending Engineer  
macqueen1968@gmail.com

Kerala Water Resources Department  
K. H. Shamsudeen  
Director  
shamsudeenhamsa@gmail.com

**FOR MORE INFORMATION CONTACT**

The World Bank  
1818 H Street, NW  
Washington, D.C. 20433  
Telephone: (202) 473-1000  

**APPROVAL**

<table>
<thead>
<tr>
<th>Task Team Leader(s):</th>
<th>Chabungbam Rajagopal Singh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved By</td>
<td></td>
</tr>
<tr>
<td>Safeguards Advisor:</td>
<td>Maged Mahmoud Hamed</td>
</tr>
<tr>
<td>Practice Manager/Manager:</td>
<td>Michael Haney</td>
</tr>
<tr>
<td>Country Director:</td>
<td>Luc Lecuit</td>
</tr>
</tbody>
</table>