

**COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED  
SAFEGUARDS DATA SHEET (PID/ISDS)**

**Appraisal Stage**

Report No.: PIDISDSA19777

**Date Prepared/Updated:** 22-Sep-2017

**I. BASIC INFORMATION**

**A. Basic Project Data**

Country:	China	Project ID:	P158717
		Parent Project ID (if any):	
Project Name:	China: Hubei Inland Waterway Improvement Project (P158717)		
Region:	EAST ASIA AND PACIFIC		
Estimated Appraisal Date:	25-Sep-2017	Estimated Board Date:	18-Dec-2017
Practice Area (Lead):	Transport & ICT	Financing Instrument:	Investment Project Financing
Borrower(s)	People's Republic of China		
Implementing Agency	Hubei Provincial Transportation Department (HPTD)		
Financing (in USD Million)			
Financing Source			Amount
Borrower			365.13
International Bank for Reconstruction and Development			150.00
Financing Gap			0.00
Total Project Cost			515.13
Environmental Category:	A-Full Assessment		
Appraisal Review Decision (from Decision Note):			
Other Decision:			
Is this a Repeater project?	No		

**B. Introduction and Context**

**Country Context**

1. Over the past three decades, China has achieved remarkable economic growth and lifted more than 500 million people out of poverty. The Gross Domestic Product (GDP) per capita increased from USD225 in 1978 to USD7,924 in 2015 . However, China faces a huge challenge to achieve its

development target of lifting the remaining poor out of poverty by 2020 , in particular the over 70 million poor farmers, as economic development has not been balanced and there are growing disparities between the more prosperous eastern/coastal provinces and the less developed western and central regions.

2. China's 13th Five-Year Plan (FYP, 2016-2020) aims to shift the growth pattern and achieve a medium-high economic growth in a more balanced, inclusive and sustainable manner. The FYP pursues innovative, coordinated, green, open, and shared development strategies to enhance the quality and benefits of economic development. To minimize the disparity between regions, it calls for strategic plans and a policy framework to support the development of the western and central regions. In particular, the FYP calls for accelerating the establishment of a modern multi-modal transportation system and logistics system in central China, in order to foster growth among city clusters and metropolitan areas along the main transport corridors.

3. Hubei Province is in central China and connects the more prosperous eastern provinces with the less developed western region along the Yangtze River. It plays a strategic role in the Development of the Yangtze River Economic Belt (YREB) and the Rising of Central China. The corridor along the YREB is China's economic backbone and accounts for over 40 percent of its population and approximately 45 percent of its GDP.

4. Hubei's 13th FYP (2016-2020) aims to eliminate poverty and boost economic development by taking advantage of its strategic location and transforming itself into the "National Interchange". On one hand, it will accelerate the development and opening of YREB within Hubei Province and establish Wuhan, the provincial capital, as an innovation center and navigation hub. On the other hand, it will also stimulate new growth along the Han River Ecological Economic Belt, where the national automobile industry centers, textiles and clothing production centers, and grain production bases are concentrated.

### **Sectoral and Institutional Context**

5. Inland Waterway Transport (IWT) in China. Inland waterways play an important role in China's transport sector and in 2014 carried about 263 million passengers and six billion tons of cargo on about 126,300 kilometers of navigable waterways. China's IWT has received considerable attention in recent years from both the national and local governments due to its energy efficiency and low greenhouse gas emissions, as well as its advantages in linking the coastal regions with the inland and western regions. Nevertheless, IWT in China has not yet realized its full potential in contributing to a sustainable transport system, and is relatively under-developed compared to other transport modes. In the freight sector, the share of total freight carried by IWT (in ton-km) in 2014 was only 7%. Two of the major constraints are: (i) a large proportion of the navigable waterways do not meet the higher navigation standards required by large vessels that can deliver much lower unit transport costs than smaller vessels; and (ii) lack of integration of waterways, ports and intermodal logistics.

6. Recognizing these constraints, both the national and local governments have plans to improve inland waterway infrastructure and connectivity between waterways and other modes of transport in order to promote IWT capacity and utilization. In 2007, the Ministry of Transport (MOT) issued the National Inland Waterway and Port Plan that envisaged the development of a high-class waterway network (defined as Class IV to Class I Standard) with a total length of 19,100 kilometers by 2020, which will connect 25 percent of Chinese cities with a population of over half a million. Subsequently, in September 2014, the State Council issued a Plan for YREB Integrated Multi-Modal Transport Corridor. The Plan calls for the establishment of an integrated multi-modal transportation system for the YREB by 2020, comprising the Yangtze River and its tributaries, railways, highways, and aviation.

7. IWT on the Han River in Hubei Province. The Han River is the longest tributary in the middle reach of the Yangtze River. It originates from southwestern Shaanxi Province, crosses Hubei Province from the northwest to the southeast, and feeds into the Yangtze River at Wuhan, and has a total of 1,376 kilometers of navigable waterways. Of the 867 kilometers of navigable waterways in Hubei Province, only four percent is classified as Class III, capable of handling 1,000 Dead Weight Tonnage (DWT) vessels; and 72 percent are Class IV (capable of handling up to 500 DWT vessels).

8. The hinterland of the Han River is a major producer of agricultural products, fertilizers, building materials and bulk minerals, which are most suitable for waterway transport in terms of cost efficiency. Significant developments in industry and agriculture have taken place along the Han River corridor in the past decade, and IWT is one of transport options for them. The Han River provides a continuous waterway link to the Yangtze River, and via the Yangtze River to the eastern coast. Freight volume on the Han River increased about 8.8 percent annually during 2000-2013 and reached 21.3 million tons in 2013. However, due to the low navigation standard, only 15 percent of freight was transported by 1,000 DWT or larger vessels; about 51 percent was transported by vessels of 500 to 1,000 DWT. Smaller, older, and low fuel efficiency vessels dominate inland waterway transport along the Han River.

9. Future growth in freight volume on the Han River is severely constrained by the low standard of the navigation channel and the low water level in the four-month dry season. Commercial vehicles, containers, and other high value cargo that are ideal candidates for long distance waterway transport cannot be fully accommodated. In addition, the management of inland waterway transport is weak; no waterway information system is available to guide and monitor traffic along the Han River; emergency response and safety management systems are insufficient to meet the future demands of transporting bulk industrial products; and the capacity of the ports for handling wastes from vessels is inadequate. The relatively low skilled IWT labor force further hinders Han River's development into a competitive freight transport mode. The proposed Project will take a comprehensive approach to eliminate infrastructure constraints, improve IWT management capacity and efficiency, and enhance the sustainability of IWT along the Han River.

10. The Hubei Inland Waterway Transport Development Plan (2002-2020) sets specific targets for waterway development: by 2020 classified waterways and high-class waterways are expected to reach 71.7 percent and 27.7 percent respectively of the 8,744 kilometers of navigable waterways. The Plan prioritizes the development of "Three Trunk" waterways, i.e., the Yangtze River, the Han River, and the Liangsha Canal. According to the relevant plans governing IWT development on the Han River, the waterway from Danjiangkou downstream will be upgraded to Class III standard by 2020, which will enable 1,000 DWT vessels to navigate year-round on the Han River. The waterway upgrade will be implemented through cascade development as the River travels from a higher elevation mountainous area to a lower elevation area. Six cascades are planned from Danjiangkou downstream: three (Wangfuzhou, Cuijiaying, and Xinglong) have been built and the remaining three (Xinji, Yakou, and Nianpanshan) are planned to be completed by 2020.

11. The proposed Project. The proposed Project at Yakou is in the middle reach of the Han River. The completion of the Yakou cascade development is a critical milestone for the Han River to reach the planned navigation standard by 2020. It will also address a key bottleneck for completed investments at other cascades to realize their full navigation capacity and economic benefits. In addition, the proposed Project will also contribute to: achieving the objectives of the YREB Strategy; enhancing the Yangtze River golden waterway function; and coordinated development to facilitate interaction and cooperation among eastern, central and western regions.

12. The proposed Project will develop an integrated powerhouse - ship lock complex, which is expected to have environmental and climate change adaptation and mitigation benefits through the promotion of a green transport mode and provision of renewable energy to Yicheng city (which is located 16 kilometers from Yakou). In addition, it will provide gravity flow irrigation for over 5,300 ha of existing farmland and reduce lifting costs significantly, improve flood resilience, and create a better landscape for recreational tourism.

13. Bank Support for IWT in China. Starting with the First Inland Waterways Project in 1995, the Bank has supported seven inland waterway projects in China. The Fifth Inland Waterways Project supported the development of Cuijiaying Complex in Hubei Province. Over the years Bank engagement in IWT in China has evolved from removing transport bottlenecks by improving IWT infrastructure, to supporting power-generation facilities as part of integrated powerhouse – ship lock complexes to improve the financial sustainability of IWT, and more recently to providing waterway management systems for coordinating multiple uses of water resources, including flood control, irrigation, power generation, and navigation.

14. China seeks continued Bank support for IWT development through the proposed Project in order to benefit from international best practices. The Bank will work with Hubei Province to further promote IWT utilization through improved integration of waterways, ports and intermodal logistics with roads and railways. The Bank will also support the Province in addressing the cumulative impact of the cascade development and riverine development by bringing in international good practices.

### **C. Proposed Development Objective(s)**

#### **Development Objective(s)**

The project development objective (PDO) is to improve inland waterway transport capacity and reliability along the Han River in support of low carbon development.

#### **Key Results**

Achievement of the PDO will be measured by the following outcomes indicators:

- Traffic passing through the Yakou Complex (to measure improvement in IWT capacity).
- Navigability of 1,000 DWT vessels (to measure reliability of the waterways).
- CO2 emission reduction (to measure climate change impacts).

### **D. Project Description**

The Project consists of two components to achieve the overall objective: Component A supports the construction of the Yakou Navigation Complex, and Component B focuses on technical assistance to support the safe, efficient, and sustainable operation and management of the Han River waterways. (Note: The ISDS project description includes works and activities to be financed by the Project, while in ESIA the project description includes associated works and facilities for environmental analysis purpose, such as the upstream reservoir dike reinforcement works and material sites.)

#### **Component Name:**

Component A: Construction of the Yakou Navigation-Hydropower Complex.

#### **Comments ( optional)**

Construction of the Yakou Infrastructure Complex, comprising inter alia, the following structures :

- (i) A Grade III ship lock of up to 1,000 DWT vessel capacity; (ii) dam sluice gates; (iii) a

powerhouse of up to 75 MW capacity; (iv) a connection dam in three sections, connecting structures between the Han River banks; (v) fish pass and fish reproduction facilities; and (vi) a dam crest-access bridge in several sections along the ship lock, sluice gates and powerhouse.

**Component Name:**

Component B: Institutional Strengthening.

**Comments ( optional)**

Carrying out of technical assistance activities and training to enhance the institutional capacity of the IWT management authorities, particularly in areas related to IWT management, sectoral policies, environment management, safety management, and waterway information system. This component will also support detailed cumulative impact assessment and mitigation plan development for the conservation of fisheries and habitats in the Han River.

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

**F. Environmental and Social Safeguards Specialists**

Ning Yang, Environmental Safeguards Specialist

Songling Yao, Social Safeguards Specialist

**II. IMPLEMENTATION**

15. Hubei Provincial Transport Department (HPTD), the project executing agency, has entrusted the Hubei Port & Shipping Bureau (HPSB) - an entity under HPTD responsible for overall administration of IWT in Hubei Province, including navigation channels, ports, and shipping - to implement the proposed Project. HPSB will be responsible for overall coordination with other related government agencies (e.g., Hubei Water Resources Department, Xiangyang and Yicheng Municipal Governments, management agencies of other complexes along the Han River), and for supervising project implementation. The World Bank Project Office (WBPO) under HPTD will act as the liaison office with the Bank and coordinate institutional strengthening activities.

16. HPSB has established a dedicated PMO, the Yakou Complex Management Office, to prepare and implement the Project. The PMO comprises units for technical design, safeguards, procurement, supervision, contract management, financial management, results monitoring and evaluation. The PMO has engaged experienced consultants to carry out detailed design, prepare bid documents, supervise construction, and monitor compliance and implementation results. Detailed designs and bid documents of the first two contracts have been prepared for advance procurement. The PMO has also developed the TORs for technical assistance under Component B. HPTD has made counterpart funds of RMB440 million available for the Project in 2017.

**III. SAFEGUARD POLICIES THAT MIGHT APPLY**

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The Project will involve construction of a hydro-navigation complex, associated works such as river embankment reinforce and transmission lines. Potential environmental

		<p>and social impacts are diverse and significant. Per OP4.01 the policy is triggered and Category A is assigned. Full assessment was carried out during the Project preparation following domestic EIA law and Bank safeguard policy requirements. EA instruments prepared include (i) an Environmental Impact Assessment (EIA); (ii) a supplemental EIA, including a cumulative effect assessment (CEA) report; (iii) an Environmental and Social Management Plan (ESMP) for the Yakou Complex; (iv) an ESMP for flood protection works; and (v) an Environmental and Social Assessment Executive Summary. During the Project preparation, multiple rounds of public consultation have been carried out according to OP4.01 and the full text of EA reports were disclosed locally and at the Bank's website.</p>
Natural Habitats OP/BP 4.04	Yes	<p>The construction and operation of the Project will have impacts on natural habitats including aquatic, riparian and terrestrial habitats. Therefore, the policy is triggered.</p> <p>Per OP4.04, survey on aquatic, terrestrial and riparian ecosystems were conducted; potentially affected natural habitats and targets for conservation identified. Potential impacts of the Project on natural habitats and ecological sensitive areas and fishery resources were assessed. No endangered or rare species or critical natural habitats are located within the project footprint or to be affected by the project construction or operation. Thus the project will not cause degradation or conversion of critical natural habitats. In view of the declining trend of fishes and aquatic and riparian habitats on the middle and lower Han River over the past decades, a mitigation hierarchy to avoid, minimize and compensate for the impacts on natural habitats have been included in the Project ESMPs. Key mitigation measures include protection and restoration of aquatic and riparian habitats, fish passage and breeding facilities, fish reproduction and release program, design and implement an ecological scheduling program to create favorable conditions for fish spawning and hatching.</p>



Forests OP/BP 4.36	No	The Project is not anticipated to involve in any forests. The policy is not triggered.
Pest Management OP 4.09	No	The Project is not anticipated to involve the use or procurement of any pesticides, or lead to change to the existing uses of pesticides. The formation of a reservoir will enable gravity flow irrigation (replacing pumping currently) to over 5000ha of existing farmland in the vicinity of the Project area, which will improve irrigation guarantee and save water pumping costs greatly. It will not change the current farming practices in the area. Hence the policy is not triggered.
Physical Cultural Resources OP/BP 4.11	Yes	The policy is triggered because survey on cultural relics during the Project preparation identified 12 ancient tombs in the vicinity of impounded area. These tombs will not be affected by the Project construction activities but will be subject to the inundation or erosion as result of the reservoir impoundment. A PCR management has been included in the Project ESMP. In addition, "chance-find" measures have been included into the ESMP as well.
Indigenous Peoples OP/BP 4.10	No	<p>The social screening by the task team found no minority village/community present in or collectively attached to the project area. That was also verified in the process of the social assessment and resettlement planning. Therefore, the OP 4.10, Indigenous People, was not triggered.</p> <p>Additionally, a standalone social assessment (SA) was prepared to establish social baseline, identify and consult with stakeholders, examine, and address social risks triggered by the project.</p>
Involuntary Resettlement OP/BP 4.12	Yes	The potential resettlement impact is to require land acquisition and resettlement at dam site, in reservoir area, and outside of river dikes where there are potential issues of flood and immersion, as well as social disturbance caused by project construction and operation such as immersion and inundation. Land acquisition including land leasing, and land protection will create significant impact on the local communities. Therefore, OP 4.12, Involuntary Resettlement was triggered, and a resettlement plan (RP) was prepared.

		<p>Further, there are three activities found linking to the project, the strengthening of Han River Dike to be conducted by provincial water authority, Power transmission line for the project power station, and Wanyang Wetland Park within the reservoir. Resettlement impacts of the activities are still not clear, therefore a resettlement policy framework (RPF) was also prepared.</p> <p>Recently, the resettlement at dam site commenced, and therefore the RP was updated to reflect the implementation status, and a resettlement monitoring report was prepared, which concludes that the implemented resettlement so far is exactly following the RP and compliant with the OP 4.12.</p>
Safety of Dams OP/BP 4.37	Yes	<p>The Bank's Safeguards Policy on Safety of Dams (OP4.37) is triggered because the project will finance construction of Yakou Dam. In addition, the existing upstream Cuijiaying Dam also triggers the OP4.37. Four dam safety plans have been prepared for Yakou Dam, including: (i) plan for construction supervision and quality assurance; (ii) instrumentation plan; (iii) operation and maintenance plan; and (iv) emergency preparedness plan. An independent Panel of Experts (POE), consisting of twenty experts, has been established to assist the PMO to ensure the Project's compliance with the OP 4.37. The POE will review and comment on the investigation, design, and construction of the Project and the start of operations; review and comment on the PMO's detailed dam safety plans; and comment on the pre-qualification of bidders during procurement and tendering.</p> <p>The PMO provided a Failure Analysis Report of the upstream Cuijiaying Dam based on the dam failure analysis results of upstream dams. All the other upstream dams have their own dam failure analysis reports, the results of the reports have been applied in the Failure Analysis Report of Cuijiaying Dam (the report). The report concluded that in the worse cases, there is no severe impact on</p>



		Yakou Dam. The POE has conducted an inspection and reviewed the safety of the Cuijiaying Dam and concluded that the Cuijiaying Dam is operationally safe. The POE will continue to monitor the safety of the Cuijiaying Dam, and the PMO and the Provincial government will take appropriate action to ensure its safety.
Projects on International Waterways OP/BP 7.50	No	The Project is located in hinterland and the Han River empties into the mid-reach of the Yangtze River. The project doesn't involve any international waters. The policy is not triggered.
Projects in Disputed Areas OP/BP 7.60	No	The Project is located in hinterland China and doesn't involve any disputed areas. The policy is not triggered.

#### IV. Key Safeguard Policy Issues and Their Management

##### *A. Summary of Key Safeguard Issues*

##### **1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:**

##### Environment

The project is assigned Category A due to the nature and magnitude of the potential environmental and social impacts involved. Full environmental assessment was carried out during the Project preparation. Based on environmental screening, four environmental safeguards policies are triggered: (i) OP4.01 Environmental Assessment; (ii) OP4.04 Natural Habitats; (iii) OP4.11 Physical Cultural Resources; and (iv) OP4.37 Safety of Dams.

OP4.01 Environmental Assessment. Per OP4.01, the Project area of influence covers the Han River mainstem, tributaries, riparian areas and upland. The Project footprint of construction covers the Yakou hydro-navigation complex and associated temporary works such as materials sites, worker camps and access roads. In addition, it covers the reinforcement of existing upstream river banks, modifications of drainage system and other facilities that will have to be built or rehabilitated to accommodate future river impoundment, and a power transmission line that will need to be built to connect the powerhouse to existing grid. On operational side, impoundment of the Yakou reservoir and operation of the Complex will have impacts on the Han River segment from the immediate downstream of Cuijiaying dam to 10 km downstream of Yakou dam and pertinent tributaries. Where needed, the study scope is adjusted as the characteristics of each environmental and social element dictated. The Project ESAs fully took into account these considerations in defining the Project area of influence.

The scoping of cumulative effect assessment (CEA) started with a review of the 15-stage cascade development along the whole Han River mainstem. To be consistent with the Project development context and with an objective of building a pragmatic and long-term mechanism to address the cumulative effects, the CEA placed emphasis on the middle and lower reaches

of Han River, namely from Danjiangkou dam/reservoir to its confluence with the Yangtze River in Wuhan.

Environmental Baselines and Sensitive Receptors/Areas. Comprehensive surveys on the baseline conditions in the Project area were conducted through literature review, field investigations and consultations. This baselines study was further extended spatially and temporally in the cumulative effects assessment to inform the historical conditions and trends of valued environmental components (VECs). Overall, the middle and lower Han River mainstem is of good water quality, fully attaining designated Class II national standard for surface waters (that is, suitable for centralized drinking water source area, habitats for rare aquatic life, spawning area for fish and shrimp, and feeding area for fry fish), while the water quality of its tributaries ranged from clean to polluted status. The Project area has been highly modified by human activities. There is a little native vegetation in the Project area; secondary and cultivated vegetation are dominant. In general, the fishery resources present a declining trend over the past 4 decades, as evidenced by the facts that the abundance and diversity of traditionally dominant fish species with floating eggs (represented by the Four Domesticated Fish, namely black, grass, bighead and silver carps) dwindled, their spawning grounds reduced markedly, and the sizes of individuals in the river decreased. Various surveys indicated that fish species with sticky eggs such as crucian carp and common carp have become dominant in the river since late 1990s.

Sensitive environmental and social receptors were given special attention during the Yakou project EA study. In terms of fauna and flora, five amphibians, two reptiles, eighteen birds and one mammal species that are under national (Class II) or Hubei provincial level of protection were recorded. A Chinese Pistache tree (*Pistacia chinensis* Bunge) classified as 'Old and Famous Tree' was found 550 m away from inundation boundary. Those species of concern will not be located within the Project construction footprint or inundation area.

On fish, 5 fish species under Hubei provincial level of protection were recorded, of which 3 were found in a comprehensive fish survey conducted in 2004; none was found during the special fish survey conducted for the Project EA in 2014. There is one migratory fish species (*Anguilla japonica*, an eel) recorded; however, it has not been found in Han River for decades. In terms of fish habitats, 3 spawning grounds for the fish species with floating eggs were identified in the 2004 survey, of which the Yicheng spawning ground that is located within the Yakou reservoir inundation area was not found in the 2014 survey, whereas the remaining two (located 13.5 and 61.8 km downstream of Yakou dam respectively) won't be impacted by the Project.

A proposed Wanyangzhou wetland park that covers Han River mainstem segment and riparian wetlands will be located in the center of Yicheng City. The wetland park will be within the Yakou reservoir impounded area. 12 ancient tombs were identified in the vicinity of the reservoir inundation area, most of which are not significant except a Wangjiagang cemetery being classified as County Level Cultural Relics Protection Unit. Other sensitive receptors such as water intakes, drinking water sources protection areas and villages were also identified. Impacts on these sensitive receptors were thoroughly assessed in the Project EA.

Environmental and Social Impacts. The Project will improve inland waterway transport capacity and generate hydropower, bringing about environmental and social benefits through reducing GHGs, air emissions and environmental footprints as opposed to alternatives where such capacities are to be fulfilled by coal-based power generation or surface transportation. In addition, the Project will enhance irrigation safety, flooding control capacity and recreational opportunities that will benefit local communities. The Project is expected to significantly contribute to local social and economic development in the under-developed areas of Hubei Province.

Given the nature and scale of the Project, anticipated environmental and social issues include:

- a) Construction impacts related to water and air pollution, noise, loss of aquatic, terrestrial and riparian habitats, soil erosion and solid wastes, social disturbance, labor influx, health and safety concerns. There will be permanent loss of 1152 mu (77 ha) aquatic, riparian and terrestrial habitats and temporary loss of 840 mu (56ha) within the footprint of the project dam. Five materials borrowing sites and two disposals sites will be used; 10 km access roads will be built; two worker camps will be installed. At peak time, 2,100 management staff and workers will work on the construction. If not well planned and managed, the construction activities, materials transport and disposal will pose major concerns to local environment, occupational/community health and safety, and navigation;
- b) Operational impacts on river hydrologic regimes, water quality, fishery resources, groundwater, infrastructure facilities, and aquatic, terrestrial and riparian habitats primarily due to impoundment of the river and navigation-related safety risks. Impoundment of the river will form a long narrow reservoir, leading to a permanent inundation area of 99,495 mu (6,633ha, including 4,794 ha waters and 1,839 ha land). The dam will further fragment the river and block fishes from migration. Reduced flow velocity will cause loss of water environmental carrying capacity, deterioration of water quality. Spawning and hatching of fish species with floating eggs will be disturbed by the dam and changed hydrologic regime. The River impoundment will also cause elevated groundwater level that affects local drainage and farmland, and will affect existing pumping and irrigation facilities, water intake and ferries. Increased water transport may lead to increased safety concerns and risks. In addition, 12 ancient tombs were identified in the vicinity of impounded area and will be subject to inundation or erosion impacts.

These impacts have been thoroughly assessed and mitigation measures included in the ESMPs to avoid, mitigate or compensate for these impacts and risks. The assessments concluded that as a low-head and run-of-river type of navigation-oriented complex, the Project will not have unacceptable environmental and social impacts. Notably, construction impacts will be temporary and manageable provided that the project ESMPs are strictly adhered to. The inundation area due to reservoir formation will be limited. The Yakou reservoir is only capable of daily regulation capacity that won't affect river hydrology regime and weaken the river's carrying capacity and ecosystems significantly.

OP4.04 Natural Habitats. The Project area has been subject to human activities for a long history. Surveys and impact assessment on aquatic, riparian and terrestrial habitats were conducted during the Project preparation; mitigation hierarchy are applied and included in the Project ESMPs.

The flooded area will be a 53km long river-like reservoir being limited within existing river embankments. Affected habitats will include wetlands, riparian vegetation, shoals, and the river itself. The dam will further fragment the river and block fish migrations. The currently flow-water condition in the Project river segment will be turned into a lake. Specific concerns and measures with respect to the natural habitats policy include the following,

Protection of fishery resources and habitats. The Yakou dam and formulation of reservoir will affect fish migration, inundate certain riparian habitats, modify natural flow patterns (which will be detrimental to fish species of which the breeding life stage depends on rapid currents to complete, notably the Four Domesticated Fish: black, grass, silver, and bighead carp). These impacts on natural habitats and fishery resources were thoroughly assessed and will be mitigated through establishment of a fish passage and fish breeding facilities associated with the Yakou complex, and implementation of fishery compensation program. The fish program cost is incorporated into the Project operational cost. A coordinated dam operation (i.e. ecological scheduling) program will be implemented annually to mimic natural flow patterns and provide favorable hydrological conditions during the fish breeding seasons. In addition, aquatic and riparian habitats restoration programs have been developed, budgeted, and included in the Project ESMP.

Wanyangzhou Wetland Park. The Yicheng City has planned to establish a Wanyangzhou wetland park in the center of the city. The main body of Wanyangzhou wetland park consists of the Han River mainstem segment and riparian wetlands, which are located within the Yakou reservoir flooded area. The wetland park was proposed with an intention to protect the highly disturbed river segment and riparian wetlands from further degradation and to provide local communities with nature education and recreational opportunities. The wetland park proposal was approved by the National Forest Bureau in December 2013 but has not been implemented except some embankment rehabilitation and landscaping works near the urban center. A compliance review concluded that a wetland park is not considered a legally protected area (such as Important International Wetland, Important National Wetland or Wetland Nature Reserve) as defined by domestic regulations. Hence the Ministry of Environmental Protection (MEP) and the forestry agency approved the Yakou project. Baseline survey of the wetland park area indicates that it doesn't show distinctive significance compared with the other Han river sections from biodiversity perspective. Thus the wetland park is not considered critical natural habitat by definition of OP4.04. Nonetheless, the forthcoming Yakou reservoir will flood current riparian areas and shoals in the wetland park area. As agreed with the Bank, a detailed planning for the wetland park was developed during the Project preparation. The detailed planning is compatible with the Yakou reservoir and includes significant riparian wetland restoration, environmental education in addition to recreational and service functions. The current detailed wetland park planning maximizes ecosystem restoration opportunities on top of its original recreational intention. The detailed planning has been approved by responsible governmental and administrative authorities during the Project preparation.

OP4.12 Physical Cultural Resources (PCR). 12 ancient tombs in the Project area of influence were identified during the Project preparation. These tombs are small in scale and are

scattered in the vicinity of the shorelines of Han River, with one identified as a county level Cultural Relic Unit according to domestic law. The tombs are outside the Project construction footprint but are subject to inundation or erosion due to future reservoir impoundment. Impact assessment and a physical cultural resources (PCR) management plan have been included in the ESIA and ESMP. Chance-find procedures are included in the ESMP.

OP4.37 Safety of Dams. The project will finance the construction of the Yakou Dam, a run-off dam with earth dam and ship-lock sections on the Han River. The Cuijiaying Dam, about 24 km upstream of the proposed Yakou Dam site, was completed in 2015 under a World Bank financed project. Cuijiaying Dam is a gravel dam of 16 meters high with ship-lock sections. The dam formulates a reservoir of 245 million cubic meters' capacity. The PMO has allocated staff specifically in charge of dam safety issues. An independent Panel of Experts (POE) has been engaged to assist the PMO in ensuring that the Bank dam safety policy is complied with.

The PMO prepared four dam safety plans based on guidance from the Bank: (i) plan for construction supervision and quality assurance; (ii) instrumentation plan; (iii) operation and maintenance plan; and (iv) emergency preparedness plan. The POE will: review and comment on the investigation, design, and construction of the Project and the start of operations; review and comment on the PMO's detailed dam safety plans.

The safety and proper operation of the Cuijiaying Dam will directly impact the safety and proper operation of proposed Yakou Dam. The PMO has prepared a Failure Analysis Report of Cuijiaying Dam, which has been reviewed by the POE. The POE has also inspected the dam. The POE review and inspection concluded that the Cuijiaying Dam is operationally safe. The POE will continue to monitor the safety of the Cuijiaying Dam and propose any remedial work needed. The Bank task team includes dam safety expertise. The PMO and the Provincial government will take appropriate actions supported by the Bank task team to ensure that dam safety issues are properly addressed.

#### Social

On social side, the proposed Project will support the development of Yakou Navigation Complex on Han River, to achieve regional navigation development plans by 2020, enhance green development, and facilitate regional integration, and benefit the people along the River. On the other hand, the project potentially causes adverse impacts on the people in areas of inundation, seepage, construction sites, etc., in terms of land losing, house/structure damage, social disturbance, etc. Therefore, the Involuntary Resettlement, OP 4.12, was triggered. On minority issue, the social screening by the task team found no minority village/community present in the project area, which is concurred by the conducted social assessment. Therefore, The OP 4.10, Indigenous People, was not triggered. Further, a standalone social assessment (SA) is prepared to establish social baseline, identify and consult with stakeholders, examine, and address social risks triggered by the project.

Resettlement impacts. With the measures to reduce resettlement, the dam and reservoir area involve three county-level administrative divisions, namely Yicheng City, Xiangcheng District and New Dongjin District, totalling 8 towns and 36 villages. The reservoir impoundment area will be retained by the current levee of the Han River and will inundate a

total area of 99,495 mu (1 ha. = 15 mu), of which 71,911 mu is water area and 27,584 mu is land area; and results in relocation of 18 households. Most of inundation will be in Yicheng City. At the dam site, three villages are to be affected with relocation of 17 households, 1166 mu permanent land acquisition and 840 mu land leasing. In addition, waterlogging drainage facilities will be constructed to prevent the farmland on both banks from being inundated after the reservoir is impounded, which involving permanent land acquisition of 720 mu in 23 villages of Yicheng City. At the same time, the inundation also affects some facilities or infrastructure, such as, pump stations, ports, sand collection, etc.

Further, there are three linkage activities found linking to the project, the strengthening of Han River Dike to be conducted by provincial water authority, Power transmission line for the project power station, and Wanyang Wetland Park within the reservoir. Resettlement impacts of the activities are still not clear at this stage, and will be regulated by the RPF.

Recently, some civil work at dam sites started and then the resettlement at dam site commenced, and therefore the RP was updated to reflect the implementation status, and a resettlement monitoring report was prepared, which concludes that the implemented resettlement so far is exactly following the RP and compliant with the OP 4.12. The completed resettlement materially encompasses 51 ha (764 mu) permanent land acquisition, 75 ha (1125 mu) temporary land use, 19 households relocated, plus some trees and facilities attaching to the land. Among the 19 HHs, eight purchased their houses in a state-owned farm and the others chose cash compensation, and productive measures for the affected is undergoing in line with the RP.

On the disbursed land compensation, the external monitoring organization has checked various certificates and records at the affected villages, including the compensation agreement for land acquisition and temporary land use, fund appropriation certificate for land acquisition and temporary land use, and compensatory payments for the affected households. In the meantime, they also verified that various agreements have been signed and relevant funds have been appropriately provided. Income restoration related training is to be done in next stage.

On the housing restoration, among those 19 relocated households, only houses of 9 households are inhabited. Most families have become migrant workers and businessmen all the year round and purchased new houses in Yicheng, Xiangyang and other places. Therefore, the house demolition has not affected their residential needs. The external monitor also visited homes of some households who have purchased second-hand houses in the neighborhood in order to check out their resettlement conditions. All of those 9 inhabited households have spent compensation funds for house demolition in purchasing satisfactory second-hand houses which became available after the original Xiangnan Prison was relocated. With the building area enlarged and the building structure improved, the housing conditions of those households have been enhanced significantly.

A detailed resettlement implementation plan was elaborated in the external monitoring report before the project was approved by the Bank.

**2. Describe any potential indirect and/or long term impacts due to anticipated future activities in**



**the project area:**

Cascade development plans for Han River mainstem have been developed and updated since 1950s; the first dam Danjiangkou was built in 1973. According to the latest Comprehensive Plan for the Trunk Han River (2012), a 15-stage cascade development along the some 1500 km long Han River mainstem was determined. Since after 2000, the implementation was accelerated and it is expected that the cascade development will be completed in the coming 3-5 years. In addition to project-specific impacts, system-wide study on the indirect and long-term impacts associated with the cascade development is needed. Thus A cumulative effects assessment (CEA) was prepared during the Project preparation.

The CEA was prepared following internationally widely-acknowledged guidance and good practices. The 15-stage cascade development on the Han River mainstem was reviewed firstly. It was recognized that putting the emphasis on the middle and lower Han River (Danjiangkou reservoir and its downstream) would be meaningful and practical for the following key reasons: a) a major assessment objective was agreed among various stakeholders that should lead to a workable inter-agency coordination mechanism and implementable action plans to address cumulative effects. Setting the study scope in the middle and lower Han River that is under the jurisdiction of Hubei Province makes the objective achievable. b) The hydrologic regimes (hence water availability, various ecosystems and socio-economic aspects) in the middle and lower Han River are largely controlled by releases from Danjiangkou reservoir given its huge storage capacity and multi-year regulation capacity. The middle and lower Han River thus can be treated as a relatively independent system for study.

Of the 7 dam/reservoirs along the length of middle and lower Han River mainstem, four have been built and are operational (i.e., Stage 1 Danjiangkou, Stage 2 Wangfuzhou, Stage 4 Cuijiaying and Stage 7 Xinglong); the remaining three stages (i.e., Stage 3 Xinji, Stage 5 Yakou and Stage 6 Nianpanshan) are expected to be completed in coming 3-5 years. Several valued environmental components (VECs) were identified through comprehensive desk review and public consultations with pertinent agencies, technical experts and other stakeholders. Hydrologic regime, water quality, fish and riparian areas were considered of high priority among those identified VECs.

Review of the historical conditions, trends and inter-dependency of the VECs leads to the following findings: a) Hydrologic regimes: flow measurement results at each fixed cross-section on the middle and lower Han River mainstem since 1956 suggest that annual average runoff ranged from 1,100-1,500 m<sup>3</sup>/s. The Danjiangkou reservoir (built in 1973) and increased human uses reduced the overall flow rate moderately compared to the natural conditions. Combined with subsequent dam/reservoirs, the spatial and temporal distribution of the runoff varied markedly as demonstrated by reduced annual variations, elevated levels, expanded areas, reduced flow velocity and decreased solid contents; b) Water quality in the mainstem and major tributaries in the past 15 years has seen continuous improvement. In recent years the designated Class II standard have been fully attained in the mainstem, while the tributaries' water quality ranged from clean to polluted status; c) The fishery resources present a declining trend over the past 4 decades, as evidenced by the facts that the abundance and diversity of traditionally dominant fish species with floating eggs (represented by the



Four Domesticated Fish, namely black, grass, bighead and silver carps) and their spawning grounds reduced markedly; fish species favoring stagnant waters such as common and crucian carps became dominant; the sizes of individual fishes decreased. Overfishing, water pollution, dam/reservoir development and other activities such as in-stream sand mining cumulatively contributed to the changes. Meanwhile, the government has made extensive protection and restoration efforts, such as water pollution control and "no-fishing" regulation that have helped mitigate the negative effects, as exemplified by the improved water quality; and d) Riparian habitats and wildlife. Terrestrial ecology was examined routinely in traditional Han River EA studies. Drawing on international advancements in research and EA practices, this CEA study specially examined the riparian areas, which are transitional between terrestrial and aquatic ecosystems, presenting distinguished ecological functions and higher relevance to the proposed developments than the general terrestrial ecosystem. Apparently, many riparian areas along the Han River have been lost due to intensified human activities (e.g. farming and urban development) and inundation resulting from reservoirs formation. Currently the riparian corridor is dominated by secondary vegetation (such as poplar and willow), shrubs, grass and crops. Wetland and adjacent emergent/submerged plants provide habitats for fish, birds and other wildlife. 44 waterfowls (13 swimming birds and 31 wading birds) were recorded, including two national Class I protected wading bird species, namely Oriental White Stork (*Ciconia boyciana*) and Black Stork (*Ciconia nigra*); and four national class II protected waterfowls. Following the formation of Wangfuzhou and Cuijiaying reservoirs, local governments established a wetland nature reserve and a wetland park in each reservoir area; two other wetland parks have been proposed. These actions result in ecological and recreational benefits as well.

Based on the deepened understanding of past activities and their cumulative effects on the key VECs, major future development activities were identified: a) Completion of the 7-stage cascade development on the middle and lower Han River in the coming 3-5 years is a highly likely condition; b) Actual water transfer of the South-to-North Water Diversion (SN Diversion) project that was put into operation in Dec 2014 and transfers water from Danjiangkou reservoir to north China. Other present and future activities that may have cumulative effects on the VECs were also considered though quantitative evaluation were impossible. Specifically, cumulative effects and mitigation measures include the following:

a) Hydrologic regimes. The SN Diversion currently transfers 2-3 billion m<sup>3</sup>/year water from Danjiangkou reservoir annually, compared to the 40 billion m<sup>3</sup>/year annual inflow into the reservoir. Flow reduction in the middle and lower Han River is moderate. In future, combined with the full cascade development, the cumulative effects on flow rate and flow velocity will be significant. The formation of reservoirs in the middle and lower Han River will to certain extent compensate for the river width and depth reduction resulting from the flow reduction but will turn the river into connected lakes. To mitigate the cumulative effects, a regulation has been enacted to ensure that the minimum releases from each dam must meet downstream environmental flow, navigation and water supply needs.

b) Water quality. Initial mathematical modelling suggests that cumulatively the SN Diversion and full cascade development may result in significant loss of water environmental carrying capacity and non-compliance with the designated Class II surface water standards. More aggressive domestic/industrial wastewater pollution and agricultural non-point source pollution control plans, and more stringent pollution discharge standards are being

implemented to mitigate the impacts;

c) Fish. Changes of flow regimes and fragmentation caused by the dams have and will further negatively impact on fish species with floating eggs such as the four domesticated fish through disturbing their breeding and hatching life stages and spawning grounds, while fish species favoring lake-like conditions will become more dominant. Mitigation measures include fish breeding facilities and fish reproduction programs that are implemented and financed by each dam operator; fish passages in the 5 dams downstream of Wangfuzhou (Stage 2), coordinated dam operation (i.e., ecological scheduling) to provide needed water rise, flow velocity and floating distance for the successful reproduction of fish species with floating eggs; fish habitat protection and restoration in the mainstem tail waters and tributaries; fishery administrative measures such as no-fishing zone and season, and educational activities.

d) Riparian areas. Riparian/floodplain areas along the middle and lower Han River will be further impacted due to the changes of hydrologic regimes (e.g. changes of seasonal flooding process) and inundation. Since riparian ecology is a relatively new area of study internationally and in China, a general mitigation strategy was proposed, including expanding the existing ecological scheduling program and create flooding process that is essential to riparian wetland (current ecological scheduling is designed for fish needs primarily), riparian vegetation restoration and other good management practices addressing over-farming, grazing and other development activities. The proposed Wangyangzhou wetland park (linked to Yakou project) has the potential to demonstrate riparian ecosystem restoration as well.

The CEA also carefully examined inter-agency coordination mechanism that is essential to address cumulative effects. Existing coordination mechanism as exemplified by the coordinated dam operation program (i.e. ecological scheduling) is overseen by the provincial government and involves pertinent provincial departments, dam operators. Proposed habitat restoration, fishery administration (e.g. no-fishing zone), and wetland park development will require close engagement with local governments, agriculture and fishery departments. In addition, the uncertainty associated with future actions require an adaptive monitoring and management approach to incorporate those scientific, technical, institutional uncertainties into the implementation and further development of cumulative effects action plans. To this end, a more detailed cumulative effect assessment will be carried out during the Yakou project implementation building on the preliminary CEA prepared during the project preparation. The primary objectives of the detailed CEA include: a) expanding the VECs and deepening understanding of the cumulative effects; b) maintaining and enhancing the inter-agency coordination mechanism; and c) developing a long-term adaptive monitoring and management plan.

### **3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.**

#### **Environment**

During development of the project feasibility study and environmental assessment, a comprehensive alternative analysis was carried out, taking into account technical, economic, environmental and social considerations. The following were given particular attention,

- With/without project scenario: the project will bring about environmental and social benefits

associated with inland waterway transport that reduces environmental footprint, air and GHG emissions that would otherwise be produced in more significant amount by road-based freight transport and fossil-based power generation. The project will also benefit local communities by enhancing irrigation safety, flood control capacity and recreational resources. The potential negative impacts can be effectively avoided, mitigated or compensated by measures included in the project design and ESMPs. Hence the “With Project” scenario was preferred.

- Dam location: three dam locations were compared. The Yakou option was selected due to less environmental and social impacts, and better navigation potential compared to the other two options.

- Reservoir storage level: three options were compared; it was determined that as a low head and run-off type complex, the differences in terms of environmental impacts are not notable. A 55.22m option was selected considering flooding area, navigation needs and power generation.

- Fish passage: several types of fish passage were considered. Since the Yakou dam is a low-lift dam that allows for natural flow pattern, a nature-imitating fish passage combined with engineered fish passage option was selected.

#### Social

On social side, measures to minimize resettlement impacts were explored. The inundated area is limited in the existing Han River dikes. There are still a few buildings and large area of cultivated land between the dikes in Yicheng City. To optimize project design to reduce inundated range and achieve the best economic, social and environmental benefits, extensive measures are explored as follows: i) determine the best water level of the reservoir by considering inundated range, river transport benefits and hydropower, etc. Alternative analysis on three water level options, i.e. 54.72m, 55.22m and 55.72m were conducted and the middle option was chosen for avoiding 1300 mu land inundation. ii) protection measures reduced relocation of 144 households with 545 persons at Yakou Village, with saving resettlement cost of 120 million Yuan. iii) engineering measures, such as, relief wells, water pipes and pipe-shaped culverts will be constructed to provide protection for the affected area of 27.42 km<sup>2</sup>. iv) land-raising method will be used for land reclamation to significantly reduce land inundation. Detailed investigation and site survey identified that the backwater inundation area contains 14,279 mu cultivated land. Upon consultation with villagers and local governments, the project will select 12 parcels of land from the inundated area on the basis of terrain, topography and area of farmland for land raising. Land-raising area is 13,892.85 mu, of which the effective cultivated land is 13,413.79 mu. In doing so, the cultivated land to be inundated will be 865 mu, rather the original 14279 mu, which greatly mitigate the negative effects on the villagers.

#### **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.**

##### Environment

During the project preparation, the project proponent engaged an experienced EIA consultant to carry out environmental and social assessment following domestic regulations and the Bank’s safeguard policy requirements. EA instruments prepared include: (i) an Environmental Impact Assessment (EIA); (ii) a supplemental Environmental and Social Impact Assessment (ESIA), including a cumulative effect assessment (CEA) report; (iii) an Environmental and

Social Management Plan (ESMP) for the Yakou complex and auxiliary works; (iv) an ESMP for reservoir embankment strengthening; and (v) an Environmental and Social Assessment Executive Summary. The original EIA was prepared following domestic regulations and approved by the Ministry of Environmental Protection (MEP) in February 2016, before the Bank started Project preparation. The supplemental ESIA and ESMPs build on the original EIA and address more extensive environmental and social issues following the World Bank safeguards policy requirements. The EA instruments have been reviewed by the Bank and are considered satisfactory.

A mitigation hierarchy of avoidance, minimization, and compensation has been included and budgeted in the project design and ESMPs, as summarized in below.

a) At design stage, through alternative analysis and design optimization, inundation area was minimized; local roads will be used to the extent possible and most access roads are located within the dam construction site; the access roads, worker camps, mixing plants and disposal sites will be located within the construction area and restored upon project completion. A 2-stage diversion scheme has been designed to ensure navigation continuity during construction. Most construction materials will be purchased from approved commercial materials sites.

b) Construction impacts management. Comprehensive construction impacts mitigation plans have been prepared to cover the dam construction site, reservoir embankment rehabilitation works, and transmission lines works. Specific plans include soil erosion control (including site restoration), contractor environmental, health and safety specifications and code of practices, solid waste and hazardous wastes management, reservoir preparation, physical cultural resources management plans.

c) Operational impacts management. To address long-term impacts on fish and natural habitats, fish passage and fish breeding facilities will be built as part of the dam complex; fish reproduction and release program will be implemented and funded by the Yakou complex operator; mainstem and tributary (Ying River) fish habitat restoration will be carried out; fish administration (e.g. no-fishing zone and season) will be enacted. Facility restoration and land elevation will be conducted to address impoundment impacts on drainage, groundwater levels and farmland.

These mitigation measures, where applicable will be included in the bidding and contract documents. The ESMPs also include institutional setup, monitoring, training arrangements and EMP budget.

The HPTD has gained rich safeguard management experiences through completing six Bank-financed large-scale transport projects. It is worth noting that during implementation of the Fifth Inland Waterway Project (i.e. Cuijiaying complex), the Bank supported the HPTD to implement a HIV/AIDS prevention program that helped it gain valuable experiences in managing health and safety issues associated with the labor influx of large-scale infrastructure project. Throughout the Yakou Project implementation, the PMO will maintain an adequate institutional arrangement and dedicated staff to manage the implementation of ESMPs. An independent environmental monitoring consultant will be hired to guide and support the PMO. The PMO will also through Hubei Provincial Transport Department build and maintain an inter-agency coordination and stakeholder dialogue mechanism in dealing with cross-

cutting issues, such as the implementation of ecological scheduling and various habitat restoration programs.

#### Social:

Land reclamation via land-raising: land-raising method will be used for land reclamation to significantly reduce land inundation. Detailed investigation and site survey identified that the backwater inundation area contains 14,279 mu cultivated land. Upon consultation with villagers and local governments, the project will select 12 parcels of land from the inundated area on the basis of terrain, topography and area of farmland for land raising. land-raising area is 13,892.85 mu, of which the effective cultivated land is 13,413.79 mu. In doing so, the cultivated land to be inundated will be 865 mu, rather than the original 14279 mu, which greatly mitigate the negative effects on the villagers.

Household relocation: The 35 affected households (HHs) with 152 persons will be relocated among which 17 HHs in Yakou Village will be provided two options, lump sum cash compensation or replacement house cost plus residential plot to build their new houses in a new designed residential area in the village, and the other 18 HHs will get lump sum cash compensation or move back in their original village to build their houses with residential plot and replacement house cost provided by governments. In addition, these households are eligible for receiving movement subsidies and resettlement allowance in line with the RP. During the process of houses restoration, the local government will also provide assistance, including necessary public facilities within these villages. In the meanwhile, special assistance from local governments for vulnerable households was designed in the process to ensure timely and fully restored housing.

Livelihood development: The project will permanently acquire 2,748 mu farmland from 60 villages, resulting in about two percent decrease of land holdings in the area of the affected villages. Main measure for people losing land, 1588 persons, is relying on cash compensation plus social security program, given the land losing portion is minor. Land raising is a measure for the people affected, 13601 persons, for which the RP defined the scope, procedures, technical requirements, operational supervision, and final quality check, budget, etc. of the vital activity. Meanwhile, for those who will be affected by the land leasing at dam site, cash compensation will be disbursed annually to the village committee and then transferred to specific households in line with the rates defined in the RP. And after the project use, the land will be returned to the villages after restoration by the contractors under supervision by RS management system. The inundation has minor impact on the livelihood of piscator downstream, and the measures to offset the impact rely on fish path construction and fry input. These designed measures will be implemented and monitored and evaluated by resettlement management system, including external monitor. Further, structures and facilities owned by villagers for agricultural production or tourism, replacement cost will be provided in line with the RP.

Enterprises restoration: Two small enterprises will be partially affected without impacts on their operation and without need to relocate. The RP investigated the impacts, and agreed on way of elevation and compensation with the enterprises who are responsible for restoration.



**Infrastructure restoration:** The project will inundate some local infrastructure and public facilities, including ferries/ports, pump stations, sand collection points, etc. in reservoir area. The project will pay full compensation to the respective owners in line with commercial evaluation results, and the owners are responsible for the construction or restoration of the affected infrastructure. The investment for the restoration has been estimated and included in the total project budget.

**Resettlement Budget:** The RP contains a resettlement budget and funding plan developed on the basis of the inventory and compensation rates. The budget was estimated about RMB 500 million, including the cost of the land raising. It consists of compensation for land acquisition, house/structures, enterprises, infrastructure, etc., fee for management and monitoring, as well as price contingency and physical contingency, which will be fully financed by the PMO, not local government.

**Institutional arrangement and capacity building:** The PMO and local governments will respectively set up a resettlement office as designed in the RP, staffed and trained to ensure proper capacity for project resettlement implementation. In the meantime, the RP has developed relevant requirements of resources for these offices. The PMO will coordinate the RP implementation which is to be actually conducted by county government via its resettlement office that will be or has been established. Further, the PMO promised to implement the RPF to ensure any resettlement planning to be prepared, financed, implemented, and monitored. A panel including resettlement experts will be established to provide advices in the resettlement implementation stage.

**Monitoring mechanism:** Internal and external monitoring mechanisms for RP implementation has been designed in the RP/RPF and will be constituted prior to the project implementation. Internal monitoring, to be conducted by the PMO resettlement office and county resettlement offices, will focus primarily on physical progress. An external monitoring agency is to be engaged to monitor and report progress of the resettlement implementation every six months. Apart from physical progress, external monitor will assess land raising, household relocation, livelihood restoration, and restoration of other facilities. The RP defines monitoring objectives, responsibilities, indicators, methodology, procedures and reporting requirements.

Recently, the resettlement at dam site commenced, and therefore the RP was updated to reflect the implementation status, and a resettlement monitoring report was prepared, which concluded that the implemented resettlement so far is exactly following the RP and compliant with OP 4.12. The completed resettlement materially encompasses 51 ha (764 mu) permanent land acquisition, 75 ha (1125 mu) temporary land use, 19 households relocated, plus some trees and facilities attached to the land. Among the 19 HHs, eight purchased their houses in a state-owned farm and the others chose cash compensation, and productive measures for the affected is ongoing in line with the RP.

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

Environment

Several rounds of public consultation and information were conducted during EA preparation. During the preparation of domestic EIA, public consultation was carried out from August 2012 to December 2015 through questionnaire survey, interviews and public meetings in the area directly affected by the project. Information disclosure was conducted in August 2012 on the website of Yicheng City Government, in August 2014 and January 2015 on the websites of Hubei Provincial Transport Department, Yicheng News and Xiangyang Environmental Protection Bureau. The full original EIA report was disclosed to the public on January 26, 2016. before the Ministry of Environmental Protection approved the domestic EIA.

During the preparation of supplemental EAs, additional public consultation and information were conducted, with participation of general public, NGOs (e.g. Green Han River), local government and agencies. Main concerns were about water quality issue, Han River pollution, implementation of environmental measures, impacts on fish species, feasibility and effectiveness of the measures for restoring fish resources, potential impacts on cultural relics, wetland park, local livelihoods, and land acquisition and compensation. Special consultation on cumulative effects were also carried out in May and June 2016 through field visits and interviews to each built complex, and two stakeholder meetings carried out in Xiangyang and Zhongxiang cities. These concerns and opinions were responded during consultation and were taken into account in the project design, development of EIAs, ESMPs and RAP. The full supplemental EIA and CIA were disclosed on June 20, 2016. The full EMPs were disclosed on June 22, 2016. The EA documents were disclosed at the Bank's InfoShop on Oct 24, 2016.

#### Social

On social side, the RP/RPF preparation is based on extensive consultation with stakeholders, including diverse levels of governments, village leaders and the affected individuals. All the affected households, enterprises and other affected were identified through the census and inventory. The socioeconomic survey was conducted from August 2014 to December 2015, covering 431 sampled households, on socioeconomic baseline in the project area, attitudes and demand of resettlement from the affected and local governments. Two rounds of impact investigation established the base of resettlement planning. Project information was provided for the affected via various channels such as newspaper, TV, posters and public meetings. Meetings were held with involved local authorities and PMO staff on resettlement policies and mitigation of negative impacts. Focus group discussion and extensive key informant interviews were conducted with local government officials and the affected villages to finalization of compensation rates, relocation arrangements and livelihood restoration measures. The measures ensured that the displaced persons participated in the resettlement planning process, particularly in the census, inventory and the formulation of the relocation and rehabilitation programs. The results of these consultations, especially on people's needs and concerns, have been reflected in the RP, which was in principle approved from local governments, and already disclosed locally on June 2, 2016 and in Infoshop on Oct 25, 2016. And the revised RP was redisclosed locally on July 7, 2017 and sent to Infoshop on August 22, 2017.

A grievance redress mechanism was designed in the RP/RPF, villages and individuals who believe that they are adversely affected by the project may submit complaints, via three channels: project management system, external monitoring and even court system. Further,



the complaints could go to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org). Environment (including Safeguards).

### ***B. Disclosure Requirements***

<b>Environmental Assessment/Audit/Management Plan/Other</b>	
Date of receipt by the Bank	10-Sep-2016
Date of submission to InfoShop	24-Oct-2016
For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors	25-Aug-2017
"In country" Disclosure	
China	22-Jun-2016
<i>Comments:</i>	
<b>Resettlement Action Plan/Framework/Policy Process</b>	
Date of receipt by the Bank	04-Sep-2016
Date of submission to InfoShop	25-Oct-2016
"In country" Disclosure	
China	02-Jun-2016
<i>Comments:</i>	
<b>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.</b>	
<b>If in-country disclosure of any of the above documents is not expected, please explain why::</b>	

### ***C. Compliance Monitoring Indicators at the Corporate Level***

<b>OP/BP/GP 4.01 - Environment Assessment</b>						
Does the project require a stand-alone EA (including EMP) report?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>

the EA report?						
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
<b>OP/BP 4.04 - Natural Habitats</b>						
Would the project result in any significant conversion or degradation of critical natural habitats?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	NA	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
<b>OP/BP 4.11 - Physical Cultural Resources</b>						
Does the EA include adequate measures related to cultural property?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
<b>OP/BP 4.12 - Involuntary Resettlement</b>						
Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Is physical displacement/relocation expected?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	TBD	<input type="checkbox"/>
152 Provide estimated number of people affected to date, or to be affected.						
Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	TBD	<input type="checkbox"/>
15,148 Provide estimated number of people affected to date, or to be affected.						
<b>OP/BP 4.37 - Safety of Dams</b>						
Have dam safety plans been prepared?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>

Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
<b>The World Bank Policy on Disclosure of Information</b>						
Have relevant safeguard policies documents been sent to the World Bank's Infoshop?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
<b>All Safeguard Policies</b>						
Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Have costs related to safeguard policy measures been included in the project cost?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>
Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	NA	<input type="checkbox"/>

## V. Contact point

### World Bank

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### Borrower/Client/Recipient

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### Implementing Agencies

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