China: Hubei Jinzhou Historic Town Restoration and Protection Project

ENVIRONMENTAL ASSESSMENT
SUMMARY

Hubei Academy Environmental Sciences

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1. INTRODUCTION

The proposed Hubei Jinzhou Historic Town Restoration and Protection Project (herein after "the Project") is located in Hubei Province of central China (See geographic locations in the Figure 1). The project will support the sustainable protection and utilization of the cultural heritage through restored historic town walls, rehabilitated water networks, improved transportation and tourism infrastructures, surrounding landscaping, temple restoration and protection, and institutional capacity development.

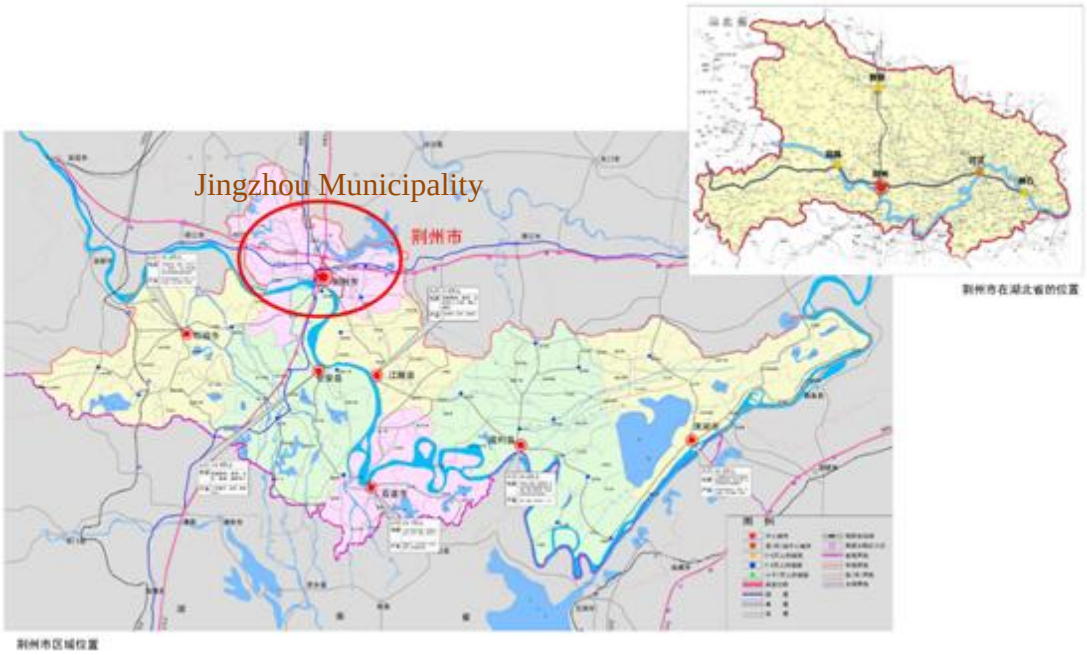


Figure 1 project locations

Considering its potential environmental and social impacts, this project is classified as a Category A as per the World Bank Operation Protocol OP4.01-Environmental Assessment. The following World Bank safeguards policies are triggered: (1) OP4.01 Environmental Assessment; (2) OP4.12 Involuntary Resettlement; (3) OP4.11 Physical Cultural Resources; and (4) OP4.04 Natural Habitats. In addition, these World Bank policies are also applicable including: (1) BP17.50 Disclosure of Information; and (2) Environmental, Health, and Safety Guidelines.

Environmental impact assessment (EIA) report (draft) has been prepared for the Project by Hubei Provincial Academy of Environmental Sciences (HAES), a prestigious EIA consultant that has provided EIA services for many World Bank financed projects. The preparation of the EIA and an associated ESMP followed the relevant laws and regulations of China, World Bank safeguards policies, as well as EHS guidelines, with continuous guidance from the World Bank task team. Besides these environmental safeguards documents, social safeguards documents have also been prepared following the requirement of OP4.12, including a Social Assessment (SA) Report and a Resettlement Plan (RP). The drafts of these documents were submitted to the Bank during the project preparation. They have been locally disclosed in local newspapers, Project Management Offices in Jinzhou Municipality and in local districts, and also have been disclosed in the World Bank Mission workshops.

This document summarizes the potential environmental and social impacts of the proposed Project based on above-mentioned safeguards documents. It highlights the key environmental and social safeguards issues related to the project construction and operation, describes the main findings and conclusion of impact assessment, and summarizes main mitigation measures and implementation management plan/frameworks.

In summary, the proposed project will have significant positive impacts of (1) improvement of ecological environment and water quality in the river networks; (2) improvement in employment opportunity and income level through the tourism development; (3) improvement in living conditions through better accessibility; and (4) improvement in cultural heritage protection and conservation. It will not significantly degrade the ecological environment; neither will it adversely affect known physical cultural resources. Thorough Environmental and Social Management Plan has been developed that can adequately avoid, minimize, mitigate and compensate the adverse impacts to acceptable level.

2. PROJECT DESCRIPTION

The overall development objectives of this project are to assist Jingzhou Municipality in conserving its cultural heritage, promoting tourism development and enhancing the quality of life of residents in the perimeters around the Historic City. The proposed project has four core components including: (A) cultural heritage conservation and tourism development; (B) improving the water environment of the historic town; (C) improving accessibility of the historic town; and (D) project management and institutional capacity building.

- **Component A: Cultural Heritage Conservation and Tourism Development.** This is the core component of the project and it aims at the conservation of tangible and intangible cultural heritage in historic town and promotion of tourism development.
- **Component B: Improving the Water Environment of the Historic Town.** This component is to improve the water quality of the moat surrounding the Historic Town and the lakes within the Historic Town.
- **Component C: Transport Improvement in and around the Historic Town.** This component aims at enhancing the accessibility of the Historic Town through an improved multi-modal transport system.
- **Component D: Assistance to Project Management and Capacity Building.** This component aims at strengthening the institutional capacity of the Project Management Office.

Among the above 4 components, the former three are focusing on physical interventions and the last one is focusing on non-physical interventions. Each component is composed of several sub-components that can be further divided into sub-projects. The detailed contents of project are listed in **Table 1**. The detailed locations of each subprojects are illustrated in the Figure 2.

Table 1 Project Composition and engineering content

Component	Sub-component	Sub-project	Content
A. Cultural Heritage Conservation and Tourism Development	A1. Ancient City Wall Rehabilitation and Protection	A1-1: Protection of West City Wall	Repair of brick city wall: 12609m2, repair of brick buttress wall: 2196 m, repair of walkway on top of city wall: 4831.2 m2,1518.3 m3, repair of mud city wall: 6307.6 m3
		A1-2: Construction of retaining wall of ancient city wall	960 m3 retaining wall
		A1-3: Plant protection and restoration	1. Reservation and protection of good vegetation; 2. Removal and replacement of poor vegetation 3. Plant more good vegetation; total area of 94800 m2
	A.2 Conservation of Kaiyuan Taoism Temple	A2-1: Kaiyuan Taoism Temple Landscape upgrade	The landscape upgrade around the temple.
		A2-2: Attractions Development	Construction of the external square, internal square, the Sinyun Pavilion, the Handan seven-king site, the Shuagntingbei Corridor, etc.
		A2-3: Protection and Exhibition of movable relics	Repair or Jinshibei tablet, protection and exhibition of multiple stone monuments, protection of original sites of Shimacao.

Component	Sub-component	Sub-project	Content
	A.3 Upgrading of the Jingzhou Museum	A3-1: Precious relics hall upgrade	Adjust tourist routes, improve the public service facilities; increase disability service facilities; seismic resistance upgrade; energy conservation upgrade; water proof upgrade; external upgrade
		A3-2: Precious relics hall exhibition	Chu Music Hall; Jinzhou Phoenix Mountain No.168 Han Dynasty tomb; Ancient paint wood craft exhibition; Chu and Han dynasty textile exhibition.
		A3-3: Precious relics hall Equipments	AC and security facility
		A3-4: Landscaping and associated facility	Demolish existing gate and turn it to a rest kiosk in the left and the sight viewing platform associated disability slope.
	A.4 Piloting conservation and Regeneration of Historic Street	A4-1:Piloting conservation and Regeneration of Historic Street	Two construction areas are selected, including 13 historic buildings and land plots as a demonstration area for the restoration and re-utilization of historic building in the protection project of historic towns. It covers 4282m2 in total.
	A.5	A5-1:Landscaping	Include Landscaping, farmland rehabilitation,

Component	Sub-component	Sub-project	Content
	Xiongjiazhong Archaeological park	and Infrastructure	parking lot (Phase II), pavement for parking lot and main roads, scholar exchange center upgrade, outdoor sprinkler system, tourist service facilities.
		A5-2:Preservation and demonstration of the relic sites	Exhibition hall for Chariot and Horse Fleets of King of Chu, and the sacrifice pit.
		A5-3:Construction of comprehensive exhibition hall	exhibition hall and its landscaping, internal decoration, equipment procurement for the multi-function hall.
		A5-4:Signage and guiding system	Signage, guiding system and online museum.
		A5-5:Management system	Public management system and security system
	A.6 Support to Tourism Development	A.6-1:Tourist reception center	2451 m2 tourist reception center at east gate, parking system.
		A6-2: Landscaping	-
		A6-3: Tourism signage and information guide system	-

Component	Sub-component	Sub-project	Content
B. Improving the Water Environment of the Historic Town	B.1 Dredging the Moat and Lakes	B1-1:Sediment dredging moat and lakes within the historic towns	3,019,000 m3 dredging in the moat, fish ponds on both sides, Xihu Lake, pond in the northeast.
	B.2 Internal Drainage Network and Interceptor Sewer	B2-1:Sewage pipe networks	New sewer main outside the moat; improved in-city interceptor for the combined sewer; improved in-city collection sewer
	B.3 Wetland Creation along Moat and Lakes	B3-1:city moat and lakes wetland	Moat bank wetland; ecological embankment; pond wetland.
	B.4 Enhanced Interconnectivity of Water Bodies and Flow Augmentation	B4-1: Improvement of water resources connection and ecological construction of rivers and lakes	To connect the whole lines of the water network in the ancient town; water source improvement; and pump stations
C. Transportation Improvement in and around Historic Town	C.1 Urban Roads Improvement	C1-1:Reconstruction of inner ring road	upgrade parts of the motorized lanes and sidewalks
		C1-2: Improve intersections of inner ring road	Optimize intersection channeling design; increase pedestrian crossing and non-motorized vehicle lane, adopt joint control by signal light for intersections between Inner Ring Road and Yindu Road, Aimen Road, Renming Road, Tuotafang

Component	Sub-component	Sub-project	Content
			Road, Jinnan Road.
		C1-3: Improve key intersections within the historic town	Optimize the intersection channeling design, setting up more signal lights, introducing signal timing plan and pedestrian crossing facilities for intersections between Jinzhong Road/Yindu Road, JIngzhong Road/Quyuan Road; Jinzhong Road/Renming Road; Jinbei Road/Renming Road.
		C1-4: Improve key intersections of Jinzhou Avenue and Jinnan Road	Optimize the intersection channeling design, setting up more signal lights, introducing signal timing plan and pedestrian crossing facilities for intersections
		C1-5: East Gate Tourist Center Intersection	Channelize upgrade and signal control.
	C.2 Non-Motor Transport (NMT) Improvement	C2-1: Improvement of bike system	(1) colored asphalt bike lane for 1.5 + m wide lanes; (2) for one-way roads install isolated bike lanes; (3) in the parks install colored asphalt bike lane; (4) bike lane signages.
		C2-2: Improve	(1) increase isolation pillars for 6+ m

Component	Sub-component	Sub-project	Content
		pedestrian system	wide roads (Jingbei Road, Quyuan Road, Jingzhong Road, Jingdong Road) to prohibit motor vehicle traffic, clear up road-occupying parking; (2) upgrade of inner ring road sidewalk and crossing; (3) repair horse lanes.
		C2-3: Crossing facility	Upgrade 12 locations of zebra crossing; install yellow flash lights; adjust 4 location of signals.
	C.3 Public Transport Improvement	C3-1: Shuttle bus system upgrade	Line 1: 18 stops; **Line 2: 15 stops;**
		C3-2: In-city bus system upgrade	12 bay-type bus stops and 1 kiosk bus stop; 28 physical electric bus stop signs; 50 hybrid vehicles for Line 15, 18 an 103.
		C3-3: Ancient town to Xiongjiangzhong Bus	40 km bus route from East gate tourist center to Xiongjiazhong. 1.5 intervals; 2 stops. 10 hybrid bus.
	C.4 Transport Signage	Static Signage	Including traffic signs within and outside the historic town

Component	Sub-component	Sub-project	Content
		Variable Message Sign (VMS)	Including traffic information system of surrounding roads, three-level parking guidance information system and dynamic traffic guidance control center.
D. Assistance to Project Management and Capacity Building	D.1 Design Review, Project Management and Monitoring Evaluation		Project management, tendering, RP, safeguard external monitoring
	D.2 Office Equipment		Collaborative office management system; engineering project management system.
	D.3 Training		Overseas and domestic training; tourism service training; cultural sites protection training and management training;
	D.4 Studies		Hydraulic modeling; website development and planning

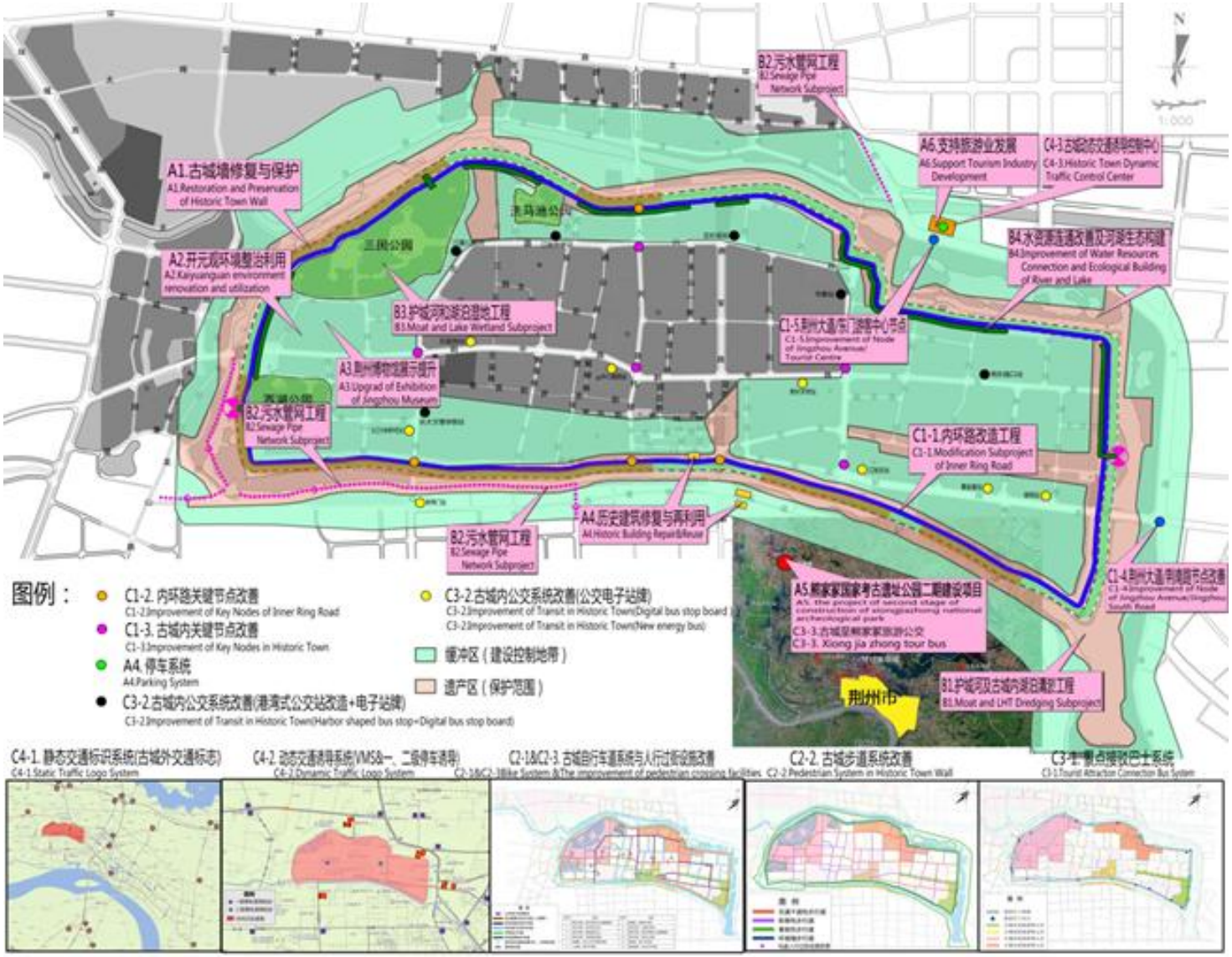


Figure 2 Location of sub-projects

3. REGULATORY AND LEGAL FRAMEWORK

The Environmental Impact Assessment (EIA) was conducted in accordance with Chinese EIA laws/regulations and the World Bank safeguards policies.

Chinese Laws and Regulations

The EIA is prepared fully in compliance with relevant China national laws, regulations, technical guidelines and standards. Compliance with a selective list of key Chinese regulations and EIA technical guidelines are summarized in **Table2**.

Table 2 Compliance with Key China Domestic Laws and Regulations

China Laws and Regulations	Project Compliance
Environmental Impact Assessment Law	• EIA prepared by licensed EIA consultant, reviewed and approved by local environmental protection agency.
Classified Directory for Environmental Management of Construction Project	• Individual EIAs have been prepared according to proper classification
Interim Measures for the Public Participation in Environmental Impact Assessment	• Two rounds of public participation conducted in surrounding communities, and info disclosure through website of Jingzhou Municipal Government.
Series of EIA Technical Guidelines on Atmospheric Environment, Surface Water Environment, Groundwater Environment, Noise Impact Assessment, Ecological Environment, and Regional Development Areas etc.	• Impact assessment follows the technical requirements of these guidelines
Series of National and local Regulations on Ambient Air, Lake Management, Soil Conservation, etc.	• Impact assessment follows the technical requirements of these guidelines

World Bank Safeguard Policy Requirements

Of the ten safeguards policies, the following are triggered: (1) OP4.01 Environmental Assessment; (2) OP4.12 Involuntary Resettlement; (3) OP4.11 Physical Cultural Resources; and (4) OP4.04 Natural Habitats. Relevant assessment and safeguards documents have been developed accordingly. In addition, the WB/IFC Environmental, Health and Safety General Guidelines is referred for the development of mitigation measures in the ESMPs.

Table 3 Compliance with World Bank Safeguards Policies

World Bank Policies	Project Compliance
Environmental Assessment (OP 4.01)	• Category A project. • Full EIA and ESMP have been prepared. • Consultation conducted as part of EIA process.
Physical Cultural Resources	• Cultural resources survey identified the city wall of the historic town, the Xiongjiazhong, the Jingzhou Museum, the relevant

World Bank Policies	Project Compliance
(OP4.11)	historic street, and the Kaiyuan Taoism Temples as physical cultural heritage in the project area. Precautious measures are developed in ESMP to avoid impact. • Chance-find procedure has been developed in ESMP.
Natural Habitats (OP4.04)	• The baseline survey investigated wild lives using the moat as habitats.
Involuntary Resettlement (OP4.12)	• Resettlement Action Plan has been developed.
Environmental, Health and Safety General Guidelines	• Mitigation measures for waste management, community health and safety and construction management equivalent to EHS guidelines requirements are developed in the ESMPs.

4. ENVIRONMENTAL AND SOCIAL BASELINES

The description of the prior-project environment (biophysical, ecological and socio-economic) establishes (i) the environmental setting within which the project will be implemented, and therefore needs to be designed to suit, and (ii) the environmental values which will be changed (either negatively or positively) by the project.

4.1 Natural Environment

Landform: The project area is located in the Jingzhou Municipality, which between the mountainous area in the west with maximum elevation of 815 m and the plain area in the east with elevation below 50 m. The landform mainly features with mountains and hills in the west and north and low-lying ground in the east. The mountainous area accounts for 1840 km2, or 13.1% of total area in the municipality. The plain area accounts for 12219 km2, or 86.9% of total area in the municipality.

Climate: The Jingzhou Municipality has a subtropical monsoon climate that favors agricultural production. The yearly average temperature varies in the range from 15.9 ^{o}C to 16.6 ^{o}C. The annual precipitation is in the range from 1100 mm to 1300 mm.

River system: The Jingzhou Municipality has many river and lakes with total area more than 80,000 ha. In the Historic Town the river system is composed of the moat and a series of inner lakes and ponds including the Xihu Lake, the Beihu Lake (also called Sanguo Park), the Ximachi Pond, and other ponds. The total water area is 0.88 km2 including the moat (0.61 km2) and the lakes and ponds (0.27 km2).

Ecological environment: The project areas are mainly in the urban area. The ecological systems feature mainly the urban ecological system, with some small forest, grassland or wetland ecological systems that are heavily affected by human activities. On the old town wall, there are many kinds of vegetations including trees, shrubs, and grasses, which, together with the animals dwelled in them, form an ecological corridor surrounding the entire town. This corridor has significance of biodiversity in the local ecological system. The project also involves the water networks including the moat and several ponds. The wetlands near these waters are also main protection targets of this project.

4.2 Socio-economic Context

The Jingzhou Municipality is located in the west of Hubei Province, with an area of 14067 km2 and a population of 6.4 million. The Jingzhou Municipality recorded a GDP of 133.49 billion CNY in 2013, a 10.4 % increase from the previous year. Under the municipality's jurisdiction, there are 3 county level cities, 3 counties, and 2 districts. The proposed project is located in the Jingzhou District. The income level in Jingzhou Municipality are summarized in the Table below.

Table 4 Income level in the Historic Town

Indicator	2013	2012
Per capita income (RMB)	20047.15	18027.58
Per capita disposable income (RMB)	18705.9	17010.34
Per capita expense (RMB)	17564.97	16143.57
Per capita consumer spending (RMB)	12760.69	11881.35
Per capita housing (m2)	-	37.72

The Historic Town is under the Jingzhou District. The town is 3.75 km long in east-to-west direction and 1.2 km wide in south-to-north direction. The total area is 4.5 km2. Within the town there are 106,240 registered residents. Among these people, approximately 1700 belongs to minority ethnic groups including Tujia, Manchu, Hui, Monglian, Hmong, Zhuang, Uygur, Dong, Zhang and Buyi, Li, Yi and Yao. However, these minorities are blended in the Han groups with no clustered concentrated minority residential areas. In the Historic Town, there are 2494 poverty household (or 5196 people) receiving poverty subsidy.

4.3 Special Environmental and Social Sensitive Sites/Areas

The Component A is focusing on the conservation of the cultural heritage sites and the development of tourism facilities. The sensitive sites are mainly the cultural heritage sites and the residents in proximity to these works. The Component B is focusing on the upgrade of the water networks. Therefore the sensitive sites are mainly the water bodies and residents in proximity to the works. The Component C is focusing on the upgrade of the facilities for the transportation system. The sensitive sites are mainly the residents in proximity to these facilities.

Physical Cultural Resources

Jingzhou is a famous city with historic significance. The municipality is rich in tourism resource especially due to its historic cultural resources. Within its jurisdiction, there are 595 cultural heritage sites among which 15 are national level protection units, 52 are provincial level protection units and 527 are municipal level protection units. The historic cultural resources in the project area are summarized in the Table below.

Table 5 Cultural Heritage Sites in Project Area

No.	Name	Location	Category
1	City Wall of Historic Town	Historic Town	National Level (Batch 4 in 1996)
2	Xiongjiazhong: Tomb of Chu Dynasty	45 km to the north of Jingzhou City	Provincial Level (Batch 2 in 1981)
3	Jingzhou Museum	Jingzhou Road (north side)	4A Scenery Area (2000)

No.	Name	Location	Category
4	Historic Buildings	Along Dongdi Street and Nanmen Street, 13 places	No. 18 and No. 10 Dongdi Street, and No. 46 Nanmen Street are provincial level cultural protection units. Others are cultural resource sites and traditional residential houses.
5	Kaiyuan Taoism Temple	To the west of Jingzhou Museum	National Level (Batch 6, 2006)
6	Bingyanglou Building	Near East Gate	National Level (Batch 4, 1996)

Communities

- For Component A, the sensitive receptors are the current residents (35 households, 100 people) on the proposed site for the tourist center.
- For Component B, the sensitive receptors are the residents along the streets (1730 households, 4320 people), 1 recovery center for disables and 2 schools.
- For Component C, the sensitive receptors are the residents along the inner ring road (220 households, 600 people).

The summary of communities are summarized in the table below

Table 6 Sensitive receptors in the Project Area

Component	Name	Location	No. of Households	No. of People
Component A	Residents on future tourist center site	Intersection of Xiaobeimen Bridge and Taihugang Road	35	100
Component B	Residents along Dongdi Street	To the south of old South Gate	960	2100
	Resdients along Xidi Street	To the south of old South Gate	450	1200
	Residents along Siji Road	To the south of new South Gate	150	450
	Residents along Fanrong Street	To the west of West Gate	120	420
	Residents along Shuixiexiangdi Street	To the west of West Gate	50	150
	Jingzhou Recovery Center for Disables	North of Nanmen Street		170
	Jingzhou Vocational Technology School	East of Historic Town		300
	Jingzhou Science and	East of Historic Town		500

	Technology School			
Component C	Residents along inner ring road	Along inner ring road	220	600

Water Bodies

- The moat around the Historic Town;
- The Xihu Lake in the town;
- The Ponds in the northeastern area of the town.

Table 6 Water Bodies in the Project Area

No.	Name	Location	Function
1	Moat	Outside the city wall	Landscaping
2	Xihu Lake	West side of the town	Landscaping
3	Ponds	Northeast site of the town	Landscaping

5. IMPACTS ASSESSMENT AND MITIGATION MEASURES

The proposed project aims at assisting Jingzhou Municipality in conserving its cultural heritage, promoting tourism development and enhancing the quality of life of residents in the perimeters around the Historic City, it can bring in multi-folder positive benefits. The positive benefits include (1) improvement of ecological environment and water quality in the river networks; (2) improvement in employment opportunity and income level through the tourism development; (3) improvement in living conditions through better accessibility; and (4) improvement in cultural heritage protection and conservation.

Meanwhile, there are also potential adverse environmental and social impacts envisaged during the project construction and operation stages. These potential impacts are mostly temporary impacts related to construction activities. Based on the environmental impacts assessment reports and social safeguards documents, the manageable adverse impacts are primarily related to:(i) impacts on ecological environment; (ii) impacts on river systems; (iii) impacts on physical cultural resources, (iv) community impacts such as resettlement in urban and rural areas, noise, dust, odour, solid waste, community disturbance and safety etc, and (v) social impacts.

These impacts are carefully assessed in EIA and SA, and measures have been developed in ESMP and RAP. In summary, the project will not have significant adverse environmental and social impacts, will not result in significant degradation or conversion of ecological environment, and will not have significant impact on physical cultural resources. The mitigation measures in the ESMP would effectively avoid, minimize, mitigate and/or compensate the impacts to acceptable levels. The key findings of potential impacts and mitigation measures are summarized as follows:

5.1 Impacts on Ecological Environment

Vegetation. The project is located mostly in urban areas that have been disturbed by intensive human activities. According to the field investigation conducted by the EIA consultant, there is

only vegetation along the old city walls in the project area. Other areas are developed with minimal vegetation. The project will permanently acquire 17.94 mu of state owned construction land. The occupation of these lands will cause permanent vegetation loss in the area. However the field investigation also confirmed that these areas are current developed with housing buildings. Therefore the vegetation loss is not significant, especially as there will be post-construction landscaping to offset any potential vegetation loss.

It is noticed that there are some cypress trees in the project area. Special care is needed during construction to avoid damage to these trees. Necessary protection measures have been identified and included in the ESMP.

Aquatic system. The project will temporarily acquire 566.5 mu land for storage and treatment of sediments from Component B. The lands to be used are currently polluted fish ponds. The sedimentation storage will have adverse impacts on the aquatic ecological environment. However these ponds are used as fish farm with artificially control ecological system instead of primeval aqua-ecological system. When the construction is completed, the fish ponds will be restored. To address these temporary potential impacts, necessary mitigation measures have been incorporated into the ESMP.

The dredging will have adverse impacts on the aquatic system in the moat and lakes. The EIA suggested segmenting the dredging activities to minimize impacts on the aquatic system. When the dredging is completed, the river functions will be restored immediately. Given that the moat and lakes are not specific spawning sites or migrating routes for fishes, and wild lives species are common in the region, these dredging activities will not cause detrimental impacts on the aquatic ecological systems. Strict mitigation measures and monitoring schedules have been developed and included in the ESMP.

5.2 Impacts on River system

There are 3 major water bodies subject to the wastewater impacts and dredging impact during construction and operation stages. The wastewaters during construction are mainly construction wastewater, domestic wastewater and sediment filtrate. The construction wastewater is mainly from the cleansing water of vehicles and equipments that contains high SS and oil content. The domestic wastewater is mainly from the construction worker and has high content of COD, BOD and SS. Among these wastewaters, the sediments filtrate will have the highest volume, reaching up to 1400 m3/day. The sediment filtrate contains high SS, COD, TN, and TP. To address these impacts, adequate mitigation measures have been developed in the EIA and in the ESMP, such as collecting and treating the construction wastewater through oil-separation and sedimentation, and recycling the wastewater after treatment; maximizing the use the local facility to reduce domestic wastewater; add coagulants to sediment filtrate as pre-treatment to Standard IA before discharging into the moat; and proper management of material storage and construction site drainage.

The dredging can cause re-suspension of sediments and release of pollutants contained in the sediments. The EIA strongly suggested using environment-friendly dredging technologies to minimize the environmental impact. With application of advance technologies and equipments, the impact area of dredging can be reduced to less than 5 meters.

During operation the wastewaters are mainly the domestic wastewater from the tourists brought by the improved tourism facilities. The wastewater will be conveyed to the Caoshi Wastewater Treatment Plant for treatment. Therefore it will not impact the river system in the town. During

operation, the flow augments by improved connectivity and pumping houses will cause increased flow rate. Discrete monitoring and control can reduce the sediments re-suspended and pollutant release if the flow rates do not exceed certain range. In addition, mitigation measures have been developed to mitigate accidents-induced impacts by enforcing speed limit when crossing sensitive water bodies. All these measures have been included in the EIA and ESMP.

5.3 Physical Cultural Resource

There are six physical cultural resources in the project area, among them 5 are direct target of protection in Component A. Currently most of the cultural heritage sites, especially the city wall, are in poor condition. This project will improve the physical conditions of the cultural heritage sites. At the same time, this project will support the capacity development in cultural heritage protection and management to achieve sustainable cultural heritage conservation.
Component A is specifically designed to conserve the physical cultural heritage in the Historic Town. The interventions include: (1) use reversible technology to repair the main body of the cultural heritage; (2) reinforce the carrier of the cultural heritage; (3) monitor and prevent natural disaster; and (4) Strengthen cultural heritage management. These inventions will not adversely impact the main body of the heritage, but will improve the social value of the cultural heritage. Therefore the project will have significant positive impacts on the physical cultural resource.

During the construction stage, improper protection plans or improper construction conduct will cause potential adverse impact to the cultural heritage. Therefore the EIA requires that all the protection plans must be prepared by professionals and must achieve permit from local authorities prior to implementation. In addition, trainings need to be provided to the construction workers to improve the awareness of the cultural heritage protection to avoid potential impact from misconduct. During operation, the cultural heritages are subject to natural weathering and pollutant from increased tourists. Therefore, routine monitoring and management are required. Both of the measures and requirements in construction stage and operation stages have been included in the ESMP. With these measures properly implemented, the potential adverse impacts on these physical cultural resources can be effectively mitigated.

Other than the cultural heritage sites mentioned, chance-find relics are possible during project implementation. The reporting and protection procedures have also been developed and included in the EIA and ESMP.

5.4 Community Impacts

(1)Land Acquisition and Resettlement

The community development in the proposed project will have social impacts related to the need for land acquisition and demolition of a number of structures. There will be a total of 17.94 mu of State owned lands to be permanently acquired which are mostly construction land. The acquisition of this land will affect 38 household (125 people) and 2 institutes. A total of 8180 m2 GFA (gross floor area) of buildings will be demolished on this land, among which 3980 m2 are household buildings and 4200 m2 are shops and office buildings owned by the 2 institutes.
In addition there will be 566.5 mu of collective owned land to be temporarily acquired during construction, in which 317 mu belongs to the city gardening bureau and the other 249.5 mu belongs to the Jingcheng Village.

To address the community impacts of land acquisition and resettlement, a Resettlement Action Plan (RAP) has been prepared in line with relevant Chinese laws and regulations, and World

Bank OP 4.12. The RAP has adequately addressed the impact, compensation standards, institutional arrangement, public participation with consideration of gender issues, budget arrangement and grievance redress mechanism.

(1) Noise and Dust

There are a total of 1985 households and 3 institutes as sensitive receptors subject to noise and dust impacts during construction and noise impact during operation. The noise sources during construction mainly come from construction machines/equipment and material hauling vehicles. Along with noise, earth excavation, backfilling and pavement can cause secondary dust impacts on nearby communities. Such noise and dust impact is of temporary nature, but can be a major nuisance to the local communities.

To address such nuisance, adequate mitigation measures have been developed in the EIA and in the ESMP, e.g. ban of night-time construction near communities; proper arrangement of construction schedule to avoid impacts on schools; enforcement of speed and horning control; utilization of low noise techniques and maintenance of machinery/vehicles; application of frequent water-spraying to quench dust; enforcement of truck cover for material transportation; enforcement of proper management of material storage; timely removal of spoil waste etc. With effective implementation of the mitigation measures, the nuisance of noise and dust from construction can be adequately mitigated.

During operation stage, the traffic on the project roads will have potential impacts of vehicle noise on the nearby communities. Traffic noise mitigation measures for those communities subject to noise exceeding applicable standard have been developed and budgeted in the ESMP, including vehicle control and speed limit/no-horning signage.

During operation stage, the operation of the project facilities, i.e. venting and air conditioning system of parking lot, and pumping system in pumping houses, will also have potential impacts of equipment noise on the nearby communities. Mitigation measures such as adoption of low-noise equipments and sound attenuation walls are proposed in the EIA and included in the ESMP.

During operation stage, the tourism facilities will receive larger volume of tourist which will bring in social noises. However, the noise prediction results suggested that the noise level in the tourist centers will not exceed standard value limits.

(2) Exhaust gas and odor

There are a total of 1985 households and 3 institutes as sensitive receptors subject to exhaust gas impacts during construction and exhaust gas and odour impact during operation. The exhaust gas sources during construction mainly come from construction machines/equipment and material hauling vehicles. Such impact is of temporary nature, and will not be a major nuisance to the local communities.

During operation the exhaust gas sources mainly come from vehicles on the project roads. The odour source mainly come from the WTPs, toilets and garbage collection and transfer stations. With effective implementation mitigation measures, the nuisance of exhaust gas and odour can be adequately mitigated. These measures are also included in the ESMP, such as timely cleanup and transfer of garbage, routinely spray of odour quenching materials, etc.

(3) Solid waste

There are a total of 1985 households and 3 institutes as sensitive receptors subject to solid waste impacts during construction and operation. The solid wastes during construction are mainly the construction waste, the demolishing waste and the domestic waste from construction workers. Mitigating measures have been developed according to the national regulation, i.e. the Standards for Construction Site Environmental Management, and included in the ESMP, such as reusing the spoil for filling and landscaping, enhance construction site management, and timely collect and transport offsite, etc.

The solid wastes during operation are mainly the domestic garbage, sewage treatment sludge, and medical wastes. Mitigating measures have been developed and included in the ESMP, such as enhance community garbage management by timely collecting and transferring, sludge beneficiary use for farm land application etc. The medical waste will be deemed as hazardous waste and be stored with specific container and handled by qualified contractors.

(4) Traffic Disturbance and Safety

Construction activities will inevitably cause disturbance on traffic, including blocking or narrowing existing road surface, traffic congestion, increase of material hauling vehicles through communities etc. These will adversely impact the daily life of nearby communities and villages, and cause potential increase of traffic accidents. To address these impacts, mitigation measures have been developed in the Social Management Plan (ESMP), e.g. safety fences and signs; traffic diversion plan and staff; information disclosure and prior notice; community safety education; community participatory monitoring; ongoing public consultation plan during construction etc.

5.5 Social Impacts

Component A. The city wall upgrade will significant improve the attraction of to the tourists and can have significant economic benefits due to increased tourist volume. However it will also have potential adverse impacts as the construction will disturb the normal business of the markets and shops. In addition, the current traffic bottleneck lies in the gates of the city walls, the construction of these gates will further increase the traffic pressure.

Component B. Currently the poor water quality in the moat has become a social problem. The rehabilitation of the moat can significantly improve the water quality. In addition, the post-project moat will become another attraction in the town and bring in extra economic benefits.

Component C. The upgrade of the transportation system can alleviate the traffic pressure in the town.

The overall needs of land acquisition and resettlement are summarized in the Table below.

Table 7 Needs of Land acquisition and resettlement

Subprojects	State owned land, mu	Temporary land acquisition, mu	Demolished GFA, m2	Affected institutions	Affected shops	Affected households and people
East Gate Tourist	17.94	0	8180	2	13	38/125

Center						
Dredging and wetland	0	566.50	0	0	0	0
Total	**17.94**	**566.50**	**8180**	**2**	**13**	**38/125**

The compensation standards have been studied and implementation arrangements have been prepared. For the permanent and temporary land acquisition, relevant provincial compensation regulations will be followed to assess the appropriate compensation standards. For the buildings to be demolished on these acquired lands, the entities can either choose for monetary compensation or property swap. Independent property evaluation agencies will be used determine the compensation standards. For the shops on these acquired lands, compensation will be provided both for relocation and for business disturbance. Compensation and livelihood restoration will be provided to 38 resettled households. Vulnerable groups will be giver special care in the resettlement process. The households can choose at their will monetary resettlement or property swap resettlement. Current they are planned to be resettled in the Binhu Community which is approximately 500 m from their current locations. Detailed compensation standards and implementation arrangements are summarized in the RP.

In the project affected areas, there are no clustered ethnic minority groups identified and the project implementation will not cause special impact to ethnic minority people.

5.6 Induced Impacts

After the project is completed, it is estimated the tourist visit will increase. The increased volume of tourists will produce approximately 36 m3/day of wastewater and 0.61 tons/day of garbage.

The sewer service in the historic town area is covered by the Chennan Wastewater Treatment Plant (WWTP) and the Caoshi WWTP. The Chennan WWTP has a design capacity of 140,000 m3/day and is currently operating at 47,400 m3/day (average). The Caoshi WWTP has a design capacity of 120,000 m3/day and is currently operating at 26,900 m3/day (average). Therefore the WWTPs have sufficient treatment capacity to address the increased domestic wastewater from tourists.

The garbage treatment service is covered by Jimei Waste-to-Energy Plant in Jinan Township to the south of the Jingzhou City. The plant is approximately 7 km away from the Historic Town. The Plant has a design capacity of 1000 tons/day which is sufficient to address the increased garbage production from tourists.

6. ANALYSIS OF ALTERNATIVES

6.1 With/Without Project

The proposed project has many advantages as it can help (1) protect the physical cultural heritage in the project area; (2) improve the living condition and promote the sustainable tourism development; (3) facilitate the overall tourism development in Jingzhou Municipality; (4) create a basis for economic re-structuring; (5) facilitate the development of new urban area.

While the proposed project will bring in significant environmental and social benefits, it will also bring in some adverse social and environmental impacts during implementation including the

construction and operation phases. The construction phase impacts mainly include some social and environmental disturbance such as traffic congestion, noise, wastewater, solid waste and vegetation damage. However, most of the impacts are temporary in nature and can be avoided or mitigated through proper measures. The operation phase impacts mainly include the waste (air, water, and solid waste) produced by the increased volume of tourists and the cultural interference brought by the tourists. Fortunately most of these impacts can also be mitigated through proper measures. The mitigation measures have been summarized in the safeguard documents including the EIA and the ESMP.

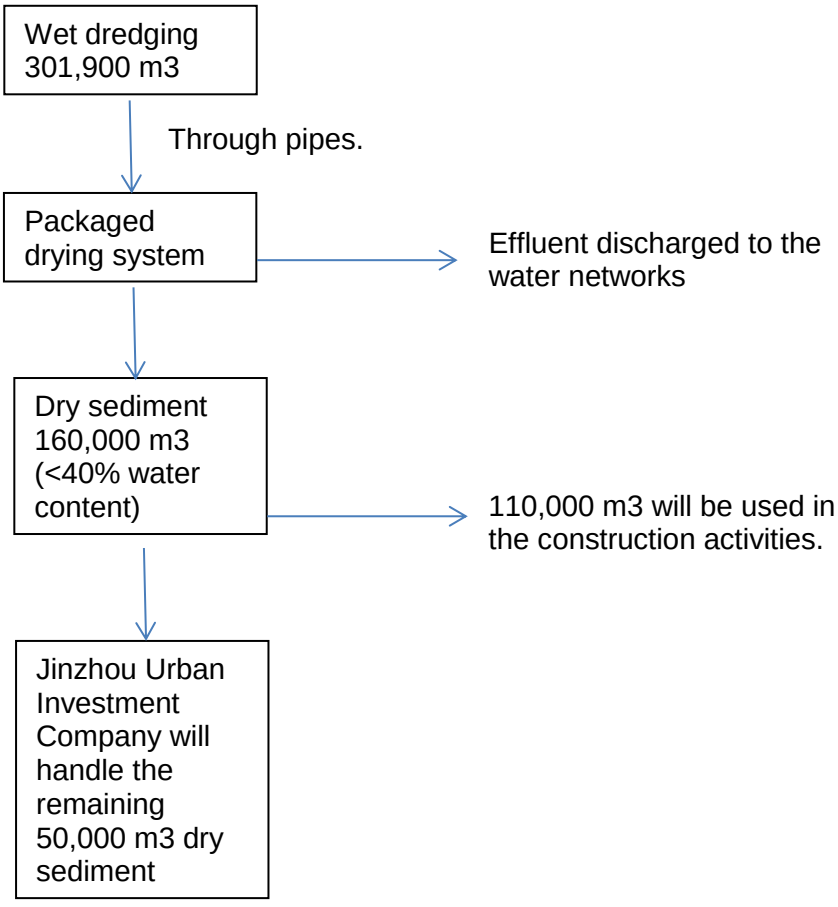
6.2 Dredging

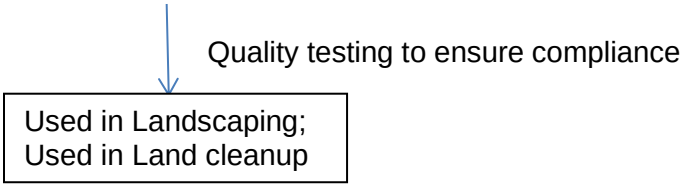
The EIA compared dry dredging (use cofferdam to form a dry area and use excavator to remove the sediment) and wet dredging (use dredging boat to cut and suck the sediment out). The dry dredging methods have the advantage of lower cost, however the drying of sediments will occupy large area of land and can lead to secondary pollution. The wet dredging methods, on the other hand, have insignificant impacts on the environment. In addition there are more choices of disposal methods for the sediments from wet dredging methods. Therefore it creates opportunity of beneficial utilization of the sediments. Therefore the wet dredging method is recommended.

6.3 Sediments disposal

For sediments disposal, the EIA compared sanitary landfill, incineration and land application methods. The land application method has the minimal impact on water environment, on ecological system, on social and landscaping effects. Therefore the land application method is recommended.

The complete sediments flow diagram is illustrated in the Figure below:





7. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Public consultation and information disclosure have been conducted following the national laws and regulations, as well as World Bank *OP4.01 Environmental Assessment*. The first round of public disclosure was on September 26, 2014 by publicizing the EIA outline on the official website of HAES and at project sites. The second round of public disclosure was conducted on March 24, 2015 by publicizing the full EIA report on the official website of HAES and project sites. In addition, the EIA report was also published on March 26, 2015 on the local press and the official website of the Jingzhou Municipality.

Table 8 Summary of Information Disclosure

	Date	Methods	Content
1st round	September 26, 2014	Poster at project sites; HAES website: http://www.hbepb.gov.cn/wsbs/gsgg/hpgs/hpdwhp/201409/t20140926_72710.html	Project title and construction content; the employer's contact; appointed EIA agent and EIA agent's contact; main tasks of EIA; method for submitting public opinion
2nd round	March 24, 2015	Poster at project sites; HAES website: http://www.hbepb.gov.cn/wsbs/gsgg/hpgs/hpdwhp/201503/t20150324_76021.html	Project title and construction content; summary of potential environmental impact with construction project; key points of EIA put forth in environmental impact assessment report; particular method for consulting public opinion
Additional	March 26, 2015	Local press: Jingzhou Daily Poster on site; The official website of Jingzhou Municipal People's Government: (http://www.jingzhou.gov.cn/article/zxgg/138612.html	Revised draft of Project EIA report and environmental & social management plan

The first round of consultation was carried out during November 2014 through a combination of public meetings, field interview, and questionnaire survey in project affected communities.

In total over 70 project affected people were consulted in project areas. The project received a broad support from the public consulted who expressed strong wishes to speed up the project implementation. The key environmental and social concerns from the public are mainly related to dust and noise impact, and traffic disturbance during operation stage. These concerns have

been adequately taken account into the mitigation measures in the ESMP and RAP, and will be closely supervised during construction period.

The EIA and ESMP have been locally disclosed with reports available in local communities and web linkage in the websites of local governments.

Table 9 Summary of Public Consultation

	Time	Place	Participants
1st for Resettlement	September to October 2014	Jingzhou historic town	Project management office, FSR consultant, Land Expropriation Compensation Office of Jingzhou District, Xicheng Street Office for resettlement of affected residents, affected enterprises and institutions, affected village cooperatives, affected population, Wuhan University
First EIA Consultation	November 10 to November 28, 2014	Affected people; relevant agencies	Individuals: Affected residents in project area; Groups: Jingzhou Environmental Protection Bureau; Jingzhou Cultural Tourism Bureau, Jingzhou Bureau of Land and Resources; Jingzhou Water Conservancy Bureau; Jingzhou Water Conservancy Bureau and etc
Second EIA Consultation	March 21 to March 27, 2015	Affected people; relevant agencies	The public in affected area of project construction, officials from local government and authorities

Between March and October of 2014, a public survey was conducted to collection public opinion on the project's potential social impacts. 447 questionnaires were distributed and retrieved. The feedbacks were collected and analyzed. The findings were reflected in the process of preparing resettlement plan.

Between September 2014 and March 2015, there have also been 6 rounds of public consultation to disclose and discuss the project social impacts, land acquisition and demolishing, resettlement methods and local intentions, housing resettlement policy, compensation policy, and restoration of shops and enterprises.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

A stand-alone Environmental and Social Management Plan (ESMP) has been developed, which specify environmental management and supervision roles and responsibilities, mitigation measures, environmental monitoring plans, capacity training and budget estimates.

8.1 Roles and Responsibilities

The implementation of ESMP requires the involvement of multi stakeholders, each fulfilling a different but vital role to ensure effective environmental management for the project. The main responsibilities of various stakeholders are summarized in the following table.

Table 10Key Environmental Management Responsibilities

Organization	Stakeholder	Responsibility
Environmental management	Jingzhou Municipal PMO	• Establish environmental and resettlement department with dedicated staff; • Ensure incorporation of ESMP measures into bidding document and civil work contracts; • Supervise the implementation of ESMP; • Organize and coordinate safeguards trainings; • Provide semi-annual environmental and social safeguards progress reports to the World Bank; • Entrust external environment expert to monitor the project; • Receive and resolve public complaints and provide resolution results to the public; • Ensure proper archive of project documents.
Social management	Jingzhou Municipal PMO	• Apply for land use plan and land use permit • Prepare relevant policies for the RP • Coordinate the implementation of RP and project construction • Coordinate other stakeholder's involvement • Provide training to other stakeholders • Report to WB on RP implementation progress • Review the RP funding plan and secure fundings • Guide and supervise the RP implementation • Manage RP filing • In charge of internal monitoring • Receive and handle complaints.
Environmental supervision	Jingzhou Municipal EPB	• Review and approve EIA • Supervise the environmental compliance of construction and operation.
ESMP measures implementation	Contractor	• Implement mitigation measures as per bidding documents, contract and ESMP; • Establish environmental management system with dedicated staff; • Receive supervision and guidance from project owner, environmental supervision engineers and local governments; • Provide regular environmental reports to PMO
RP implementation	Jinzhou Municipality Resettlement Office	• Conduct RP survey • Implement the RP • Prepare the funding use plan and report • Manage the compensation distribution • Handle complaints and claims • Cooperate with the external monitoring agency • Maintain documentation of the RP implementation • Submit to PMO relevant documents.
Consultant	Design institute	• Prepare FSR and project designs • Incorporate ESMP requirements into design documents
	Environmental	• Supervise the implementation of ESMP measures

Organization	Stakeholder	Responsibility
	Supervision Engineer	by contractors as per contract requirements; • Provide regular supervision reports to PMOs.
	EIA consultant	• Prepare EIA and ESMP
	Environmental monitoring institute	• Licensed institute to conduct monitoring plan of ESMP for both construction and operation stages • Provide monitoring reports to PMOs

8.2 Mitigation Measures

Mitigation measures have been developed in the ESMP. The development of mitigation measures follows the national laws/regulations, technical guidelines and construction norms, with references to previous similar project experiences and World Bank safeguards policies and *Environmental, Health, and Safety General Guidelines.*

8.3 Environmental Supervision

During construction, environmental supervision shall be carried out by qualified supervision unit reporting to the PMOs. Each supervision engineer company will be required by contract to assign dedicated Environmental Supervision Engineers to supervise the daily implementation of environmental protection measures by contractors. The key responsibilities of the environmental supervision engineers include:

- Develop environmental supervision plan prior to commencement of construction;
- Review preliminary design and detailed design to ensure that environmental mitigation measures in ESMPs are incorporated into project design;
- Assist PMOs to organize and implement environmental training for contractors and management staff;
- Review environmental specifications of the construction contracts;
- Review construction organization plan, technical plans and construction schedule to ensure proper handling of environmental safeguards issues;
- Review environmental compliance of construction equipment and machines;
- Conduct daily supervision on ecological protection, water, air and noise impact, and supervise the implementation of environmental mitigation measures, and accept and sign off the completion based on environmental compliance;
- Identify problems of ESMP implementation and enforce correction by contractors;
- Provide regular reports on ESMP implementation status to PMOs.

8.4 Environmental Monitoring Plan

Comprehensive environmental monitoring programs have been designed for construction and operation phases for the community infrastructure facilities and public service facilities. Monitoring includes water quality, noise, and ambient air quality. The PMOs will entrust licensed environmental monitoring institutes to carry out these plans. (Please refer to the ESMPs for detailed monitoring plans)

8.5 Capacity Training

To ensure effective implementation of environmental management plan, environmental training program has been developed. Environmental training will be conducted prior to the

commencement of construction, with target groups of relevant staff of all PMOs, contractors and supervision engineers. Training contents will include relevant national environmental laws/regulations; World Bank safeguards policies, environmental management plans, environmental supervision and monitoring techniques and procedures, Environmental Code of Practices (ECOPs), if any, and reporting requirements etc. A total budget of RMB 700,000 has been planned for the environmental training plans in the ESMP.

8.6 ESMP Budget Estimates

All mitigation measures have been budgeted and fully incorporated in project costs including monitoring and supervision. The total ESMP budget includes the environmental protection cost estimate and resettlement cost estimate. The environmental protection budget for the project is RMB 7,880,000, of which RMB 1,370,000 is included in the engineering cost and 6,510,000 is additionally required by the EA. The resettlement budget is RMB 98,682,048.

Table 11 Cost Estimate for Environmental Protection measures

	Environmental protection measures			Quantity	Investment (1,000RMB)	Remark
	Part I. Environmental monitoring					
	Environmental monitoring during construction period			RMB100,000/year for 5 years	500	Additional
	Environmental protection acceptance and monitoring upon completion			-	700	Additional
	Part Ⅱ environmental protection measures					
Construction period	Wastewater	Basic washing wastewater	Reuse after sedimentation	13 sets	80	Additional
		washing wastewater	Reuse after oil separation and sedimentation	9	80	Additional
		Foundation pit wastewater	Reuse after treatment via secondary sedimentation tank	17	80	Additional
		Spoil ground residual water	Discharge after coagulation-sedimentation	2 spoil grounds	1,500	Additional
	Exhaust gas	Fugitive dust	Equip with small tank car to sprinkle road and working face to effectively suppress dust pollution	Self-made	100	Engineering cost
	Noise	Construction noise	Set up noise reduction facility such as temporary sound insulation baffle at the location near residential area	10	160	Engineering cost
	solid waste	Construction scraps and demolition waste	Reuse in civil work	5,550 t	140	Engineering cost
		Domestic waste	Rely on existing municipal sanitation system	375t	50	Engineering cost

	Environmental protection measures			Quantity	Investment (1,000RMB)	Remark
		Dredged sediment	Reuse in wetland and revetment construction after dewatering and solidification	300,000m3	320	Engineering cost
	Ecological protection	Restore temporary land, water & soil conservation, soil restoration			1,870	Additional
	Social	Public	Media and public notice; billboard at construction site	30 locations	40	Engineering cost
Operation period	Wastewater	Sewage	Standard Grade-2 handover by Caoshi Wastewater Treatment Plant after sedimentation in the cesspool, then discharged to secondary Caoshi Wastewater Treatment Plant for further treatment	1	40	Engineering cost
		Connection channel	Sludge cleaning	9 locations	50	Engineering cost
	exhaust gas	Exhaust gas	Forced exhaust fan system	1 set	150	Engineering cost
	Noise	Protection at acoustic sensitive point	Sound insulation and noise reduction at pump station	2	120	Engineering cost
	Solid waste	domestic waste Common waste	Set up sorted trash bin, timely cleaning and pick-up		200	Engineering cost
	Part III environmental management					
	Training of environmental management participants during construction period				700	Additional

	Environmental protection measures	Quantity	Investment (1,000RMB)	Remark
	Cost for external monitoring		1,000	Additional
	Total environmental protection investment		7,880	

*Costs marked “Additional” are induced by measures required in the EA. Costs marked “Engineering cost” are costs included in the engineering cost.

Table 13 Resettlement Cost Estimate

No.	Item	Amount
1	Basic Cost	82891263.08
1.1	Land acquisition	33901663.08
1.2	Demolishment	48989600.00
2	Other Cost	3357096.15
3	Administration cost	4144563.15
4	Contigency	8289126.31
	Total	98682048.70