

# Due Diligence Report

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## People's Republic of China: Proposed Multitranche Financing Facility and a Proposed Loan for Gansu Heihe Rural Hydropower Development Investment Program (Project 1: Erlongshan Hydropower Project)

Prepared by the Erlongshan Hydropower Company for the Asian Development Bank (ADB).

The Short Resettlement Plan is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

## CURRENCY EQUIVALENTS

(as of 01 January 2006)

Currency Unit	—	yuan (CNY)
CNY1.00	=	\$0.124
\$1.00	=	CNY8.083

## ABBREVIATIONS

AAOV	—	average annual output value
ADB	—	Asian Development Bank
EHC	—	Erlongshan Hydropower Company
EPB	—	environmental protection bureau
GEPRI	—	Gansu Environmental Protection Research Institute
ha	—	hectare
HPP	—	hydropower plant
km	—	kilometer
m	—	meter
MW	—	megawatt
PRC	—	People's Republic of China
SRP	—	short resettlement plan
QNNR	—	Qilianshan National Natural Reserve

## NOTE

In this report, "\$" refers to US dollars.

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### GANSU HEIHE HYDROPOWER DEVELOPMENT PROJECT Distribution of Construction Sites of Erlongshan Hydropower Project IN THE PEOPLE'S REPUBLIC OF CHINA

- Proposed Hydropower Project
- Future Hydropower Project
- Operational Hydropower Project
- Under Construction Hydropower Project
- Village
- Road
- - - Tunnel
- River/Creek



Note: Not to scale



## I. INTRODUCTION

1. This Short Resettlement Plan (SRP) and Due Diligence Report have been prepared to summarize the impact of involuntary resettlement issues relating to the Erlongshan Hydropower Project (Project 1), located on the Heihe River in Gansu Province in the People's Republic of China (PRC). The proposed Project 1 is the first of the two hydropower plants (HPPs) in the Gansu Heihe Rural Hydropower Development Investment Program (the Investment Program). The report was prepared in accordance with the Asian Development Bank's (ADB's) *Involuntary Resettlement Policy*. The Project 1 is classified as Category B in accordance with ADB involuntary resettlement classification criteria. The total cost for the Project 1 is \$44 million. ADB is considering providing finance of \$22 million and, \$22 million will be financed by the PRC Government. The construction period for the Project 1 is estimated as 3 years.

2. The Project 1 is located in Zhangye City, Gansu province, PRC, which has a relatively high poverty rate of 29.3%. Zhangye City has been facing chronic electricity shortages for several years due to low installed generation capacity in the city and large distances from the main power plants of Gansu province. Associated high transmission losses result in unreliable (frequent outages) and low quality service (low end voltage electricity). The frequent interruptions of electricity supply have been a major factor inhibiting the economic development of Zhangye City. The power shortages are anticipated to become more acute based on projected demand growth. The Project 1 is seen by the local and provincial governments as a vital infrastructure project to accelerate Zhangye City's economic development. The area is relatively rich in hydropower resources. ADB has previously supported development of the Gansu Clean Energy Development Project<sup>1</sup> on the Heihe River Cascade Development Scheme (the Scheme). It included construction of a 98 megawatt (MW) HPP on the Scheme at Xiaogushan, approximately 27 kilometers (km) downstream from site of the Project 1.

## II. DESCRIPTION OF THE PROJECT

3. The proposed Project 1 consists of a 50.5 MW 'run-of-the-river' hydropower facility (2x20 MW and 1x10.5 MW units). The Project 1 is located within Sunan County, in Zhangye City with altitude of 2,100 meters (m). The Project 1 location is presented in Map 1, Map 2, and Map 3. The Project 1 will provide base load electric power generation with an annual electricity generation of 174 gigawatt-hour. No dam/weir construction or impounded water reservoirs is associated with this Project. Instead, the Project 1 will re-divert the discharge from the Sandaowan HPP directly to the Project 1 intake structure. The Project 1 occupied 114.44 mu or 7.63 hectares (ha) of land, including 43.5 mu or 2.9 ha of permanently occupied land in January and December 2005 and 70.94 mu or 4.73 ha of temporarily occupied land since January 2005. The Project 1 will also include construction of the following:

- (i) Buildings: (a) temporary workers accommodation and permanent office; and (b) residential building.
- (ii) Power Station Structures: (a) open water intake canal (217 m), (b) front pool<sup>2</sup> (10–22 m wide and 45 m long), (c) water discharge canal (70 m), (d) underground 4.7 km water intake tunnel (6 m diameter) with maximum flow capacity 98 m<sup>3</sup>/s, and pressure regulation shaft (15 m in diameter), (f) power house and pressured water channel (303 m), and (g) 110 kilovolt substation.
- (iii) Borrow Pits: two waste rock areas and two borrow pits.

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<sup>1</sup> ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Gansu Clean Energy Development Project*. Manila (Loan 2032-PRC).

<sup>2</sup> Front pool locates between open water intake canal and underground water intake tunnel, and has a function to control the water flow to underground water intake tunnel. Excess water in front pool will be discharged to water discharge canal.

### III. DESCRIPTION OF PROJECT AFFECTED AREA

#### A. Physical and Environment

4. **Topography.** The Project 1 area consists of steep mountains. The Heihe River is located in a steep V-shaped river valley. The side slopes of the valley range from 60° to near vertical. There are five relatively large gullies connected to the Heihe River in the Project 1 area. The distance between the intake structure and the discharge structure is approximately 10.3 km. Along this section, the Heihe River is approximately 30–60 m wide, has an average grade decline of 8.6% and a vertical fall of 67.5 m. The intake water for the Project 1 is taken directly from the tailwater outlet of the Sandaowan HPP. The water is then passed through a 4.7 km tunnel to the Project 1, which is located approximately 10.3 km downstream in the bank of the Heihe River.

5. **Climate.** The Project 1 area has four seasons and a dry climate with low rainfall. Winter and spring are long and cold with a river icing period of 4 months, while summer and autumn are short and cool. The rainfall is higher in the South of Qilianshan Mountainous region, with an annual average of 300–500 millimeters. However, in the middle of Qilianshan mountainous region, the annual rainfall is only 100–200. In March and April, snowfall is frequent. Based on data from the Yingluoxia Hydrographic Station, the average temperature is 8.5 degrees centigrade (°C) with maximum at 32.4°C and minimum at -33°C.

6. **Water Resources and Quality.** The Heihe River originates from the Qilian and Datong mountains in Qinghai Province, and terminates at the Juyanhai Lake in Inner Mongolia, with no hydraulic connection to the sea. Surface runoff is fed primarily by rainfall and snowmelt from the Qilian Mountains. The runoff is not even throughout the year, with most runoff concentrated in the June–September rainfall season. The water quality of the Heihe River contains lightly mineralized calcium magnesium carbonate. There are no factories located upstream of the Project 1. The water quality monitoring results indicate that the water quality is the highest quality grade, designated for natural protection areas and drinking water reservoirs.<sup>3</sup>

7. **Noise.** The Project 1 is located in the Heihe River Valley and is surrounded by high mountains, which are seasonally used as pastureland. There are no permanent residents in the Heihe River Valley. The nearest residential area (direct distance) is Louzhuangzi Village, which is located approximately 20 km from the Project. Although there is no noise monitoring data for the proposed site, pre-construction noise monitoring was conducted in November 2002 at Xiaogushan HPP, located approximately 37 km from the Project. These monitoring results indicated conformance with Grade I of the Urban Environmental Noise Standard (GB3096-93), indicating low background noise levels.

#### B. Biological Environment

8. **Qilianshan National Natural Reserve.** The Project 1 is located in the experimental zone of the Qilianshan National Natural Reserve (QNNR). The QNNR was established in May 1988 through the State Council and covers parts of eight counties and cities. The location of the QNNR is indicated on Map 2. Currently, three regulations govern the QNNR: (i) the State Regulation for Natural Reserves, 1994, (ii) Gansu Provincial Regulation for Natural Reserves, 1999, and (iii) Regulation for Management of QNNR, 1997 (revised in 2002). The reserve is designed to conserve water resources and protect forest and grassland ecosystems. The QNNR administration is under the Gansu Provincial Forest Administration and consists of 21 management stations, 133 forest protection stations, and 10 check stations staffed by 968 people. There is one access road into the Project 1 site. There is one QNNR check station across the road to ensure logs are

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<sup>3</sup> People affected by the land acquisition do not have any custom to use the surface water from the river for drinking purpose. They use mountain spring for drinking purpose.

not removed from the area. Current human activities conducted in the QNNR experimental zone include hydropower generation, stock grazing, agricultural crops and fruit trees, tourism facilities and commercial activities carried out in numerous villages. There is no industrial activity in the QNNR experimental zone within the Project 1 area.

9. **Flora.** There is a small forested area (approximately 6.5 ha) located on a floodplain area adjacent to the Project 1 intake structure. The forested area has been planted by the QNNR Forest Station. The forested area includes two temporary accommodation buildings for QNNR staff managing protection of the broader QNNR. The Project 1 infrastructure construction will require destruction of a small number of trees. The Project 1 requires permanent acquisition of 2.9 ha and temporary acquisition of 4.73 ha. These areas will consist mainly of barren areas along the edge of the Heihe River. There is no agricultural land or permanent residents in the Heihe River Valley in the vicinity of the Project.

10. **Aquatic Life.** In June 2004, the Zhangye Environmental Monitoring Station conducted an aquatic survey of the section of the Heihe River impacted by the Project. The survey identified very limited numbers of 2 fish species,<sup>4</sup> (i) flat tooth fish, and (ii) Banghua fish. Both species were located in the slow moving sections of the Heihe River.

### C. Sociocultural Environment

11. **Local Population.** The Project 1 is located in an area within Xishui Tibetan Township, Sunan Yugur Autonomous Prefecture, Zhangye City. The Project 1 is located along a single dead-end road which was built in 2003 to connect the existing HPPs and proposed Project 1 of the Scheme. The nearest village by distance (approximately 20 km) is Louzhuangzhi Village, population 276 (2002), but it is located on the other side of a high mountain. The nearest village by road (approximately 37 km) is Bajiaowan Village, population 398 (2002). There are no permanent residents in the Heihe Valley in the vicinity of the Project 1 site. Total population of Yugur Autonomous Prefecture is 35,000, which is composed by 10 different ethnic groups, of which the main ones are Tibetan, Yugur, Han, Hui, and Mongol. Xishui Tibetan Town, which is direct Project 1 affected area, has 1,136 population or 296 households. Over 90% of the population of Xishui Tibetan Township is Tibetan origin. The Township has five villages under its administration. The 192 people have the non-agricultural household registration. Over 90% of the rural people are herdsmen. The Xishui Tibetan Township is predominately mountainous and there is very limited land suitable for irrigation, which is essential for cultivation. There is low and unreliable rainfall and the area experiences frequent severe droughts (it is classified as semi-desert area). In winter, the grasslands are buried in snow, and temperatures fall as low as -30°C, putting extreme pressure on livestock and people.

12. **Land Use and Economy.** The potentially impacted population lives in Louzhuangzhi Village and Bajiaowan Village, with a combined population of 674 (2002). The villagers depend on herding sheep and smaller numbers of other livestock (such as yak, horse, donkey, mule, and goats) in steep dry mountain grasslands. Less than 10% of the labor force has nonagricultural livelihoods. Surveys conducted for the Xiaogushan HPP development in 2002 indicated that a majority (67.8%) of households depended entirely on livestock and livestock products for direct consumption and sales incomes. In 2001, there were 15,800 livestock, of which 2,100 were large animals (yak, cow, horse, mule, and donkey) and 13,700 sheep and goats. There are two families from Louzhuangzhi Village who utilized the Project 1 construction area for sheep grazing during August and September each year. There is no other commercial use of the Project 1 site by the residential population of the area.

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<sup>4</sup> Affected community (Tibetan community) does not have any custom to catch a fish.

13. Only 45% of households had some terraced and irrigated cropland to supplement herding income in valleys low enough to grow annual crops such as grain. The area is a grain deficit area. Households must sell livestock, livestock products, and wood to buy grain and consumer products; pay for coal, electricity, kerosene, and diesel fuel for their tractors or wheel trucks and procure services including education and medical care. Cropland is located in valleys at altitudes of 1,500–2,500 m asl, where the 100–120 days frost-free periods permits a single annual crop. Food crops include wheat, highland barley, and beans; while oats and hay are dried and stored for livestock winter fodder. Herder families gather berries, mushrooms, and herbs in season from indigenous spruce forests in the mountains, which are dried for winter food. They plant several fruits (peach, apricot, plum, apples, and pears) in valley courtyards for home consumption. It is technically but not economically feasible to plant considerably more fruit trees. Based on the field survey, no cultural relics or historic structures or features are located in the Project 1 area. According to survey data for the Xiaogushan HPP in 2002, the average income for farmers and herders in the Project 1 area was CNY3,692 per person.<sup>5</sup> There are no factories located in either Louzhuangzhi Village or Bajiaowan Village. The income is mainly from agriculture and herding.

14. **Culture.** Tibetans in Xishui believe in Tibetan Buddhism, speaking Tibetan language, and thus they are self-identified and identified officially by the government and their neighbors as a distinctive cultural group. The fact that they are recognized as belonging to an autonomous township testifies this. Tibetans in Xishui has the Amdo dialect of Tibetan language with a written script shared by all the Tibetans in China. Nowadays, old people can still communicate in Tibetan and young people understand most of them. Tibetans in Xishui still maintain pastoralism, with grassland as their means of subsistence and with animals as their main resources of livelihood. The male and female enjoy equal rights and the all the people have a strong orientation for development. The ethnic relations in the area are harmonious. In fact, Xishui is located in the Sunan Yugur Autonomous County, and Tibetans and Yugur<sup>6</sup> have coexisted in this area for centuries. No sign of ethnic or gender discrimination within the community can be detected. All the residents worship mountains and waters together with the Tibetans.

#### IV. PROJECT 1 IMPACTS (AFFECTED INVENTORIES)

##### A. Permanent Land Acquisition

15. Total 43.5 mu or 2.9 ha of (non-irrigated) grassland was permanently acquired which affected two households or 12 people in Louzhuangzhi Village of Xishui Township. The breakdown by each component is shown in the Table 1.

##### B. Temporary Land Occupation

16. Total 70.94 mu or 4.73 ha of (non-irrigated) grassland has been temporally occupied for a maximum period of 3 years which affected 7 households or 42 people. The breakdown by each component is shown in the Table 1.

<sup>5</sup> The average rural income per capita in Gansu Province is CNY1,852 in 2004 and average GDP per capita in Zhangye City is CNY5,973 in 2002.

<sup>6</sup> The Yugur is unique to Gansu. Over 80% of them concentrated in Sunan County. There are 2 branches of the Yugur. The East branch speaks a language close to the Mongolian, while the West branch is close to Uyghur. Neither has writings but both are bilingual in the Han. They believe in Lamaism. They are herder with semi-agriculture.

**Table 1: Project 1 Impacts on Land**

Items	Permanent Land Acquisition (mu)	Temporary Land Occupation (mu)	Other Assets	Affected Households/People by Temporary Land Occupation	Affected Household/People by Permanent Land Acquisition
Buildings (Office, workers accommodation)	26.8	14.4	0	2 / 12	1/6
Power Station Structure (power house and canals)	16.7	32.54	1seasonal herding camp	1 / 6	1/6
Borrow Pits	0	24.01	0	4 / 24	0
<b>Total</b>	<b>43.5</b>	<b>70.94</b>	<b>1</b>	<b>7 / 42</b>	<b>2/12</b>

### C. Other Assets

17. The Project 1 was required to demolish a seasonal herding camp owned by one affected household. Erlognshan Hydropower Company (EHC) already helped to reconstruct the camp in another location based on the household's need and newly constructed camp is much better quality than before.

18. Construction activities will require removal of a small number of trees (<10). The QNNR Bureau has maintained a record of all trees in the proposed construction areas, all of which belong to the QNNR. The QNNR Bureau requires compensatory planting for any tree removed during construction and payment of a fine for every tree removed during construction.

19. There is 31 km of access road which used to be a trail. This road is shared facilities amongst the existing HPPs and proposed Project 1 along the Scheme. This road have already been upgraded to support preliminary site preparation works and to service the upstream Sandaowan HPP. The access road consists of a single dead-end road along the Heihe River to provide access the HPPs. No individuals were affected by the upgrading of access road.

### D. Affected People and Community

20. Two households or 12 people were affected by the permanent land acquisition and 7 households or 42 people were affected by the temporary land occupation. The Project 1 also required the removal of some trees and demolition of one seasonal herding camp. There is no agricultural land acquired by the Project 1 for temporary or permanent construction requirements. Access to grazing land will be restricted for two households from Louzhuangzi village, who historically utilized the Project 1 construction area for sheep grazing during 2 months (August and September) each year. These households have been compensated by a one-off lump sum payment for loss of access to grazing land. The Project 1 occupies less than 0.5 percentage of their grazing land on the surrounding slopes, so the loss is negligible. Actually, the sheep herders access to the area has been improved due to construction of access roads. The information on affected households is presented in Tables 2 to 5.

**Table 2: Social Data of Affected Households  
(as of April 2006)**

Affected HH	Number of Family	Occupation	Nationality	Education of Head of Household
1	6	Herder	Tibetan	Senior High School (12 years)
2	6	Herder	Tibetan	Primary High School (9 years)
Total	12			

HH = household.

Source: Household interview, April 2006.

**Table 3: Impact Assessment of Affected Households  
(as of April 2006)**

Affected HH	Cultivated Dry Land (mu)	1	2	3	Source of Income			5
					Original Grassland (mu)	Acquired Grass Land (mu)	% of Land Loss (2/1*100)	
1	12	4,800	17.84	0.37%	25,000	0	100%	92.5
2	12	6,800	25.67	0.38%	30,000	0	100%	114.0
Total	24	11,600	43.5					

CNY = yuan, HH = household.

Note: Acquired grass land is only used by affected households for 2 months in a year (August and September).

Note: Poverty line in the Project 1 area is CNY919/person/year. Affected household income per capita is CNY4,000 to 5,000 per year. Average rural income per capita in Gansu Province is CNY1,852 in 2004 and average GDP per capita in Zhangye City is CNY5,973 in 2002.

Source: Household interview, April 2006.

**Table 4: Comparison between Income Loss and Compensation**

Affected HH	Expected Income Loss (CNY/year)	Compensation (2*CNY600/mu)	Compensation Has Been Used for:
1	92.5	10,704	Building fences in grassland, education for children, purchasing feed for domestic animal
2	114.0	15,402	Building fences in grassland, education for children, purchasing feed for domestic animal

CNY = yuan, HH = household.

Source: Household interview, April 2006

**Table 5: Economic Data of Affected Households (As of April 2006)**

Affected HH	Household Savings in Cash (CNY)	Household Debt (CNY)	Electricity Cost per year (CNY)	Household Asset (Sheep) and Cash Equivalent (CNY)	Housing Condition	Other Assets
1	3,000	5,000 (for education and medical expense)	300	210/63,000	Single story brick made permanent structure, separate kitchen, 3 bed rooms, living room, separate toilet, separate storage, electrified, stove for cooking	TV with satellite dish, monocycle, three wheel tractor, land line telephone, mobile phone, refrigerator
2	5,000	0	300	350/105,000	Single story brick made permanent structure, separate kitchen, 3 bed rooms, living room, separate toilet, separate storage, electrified, stove for cooking	TV with satellite dish, monocycle, three wheel tractor, land line telephone, mobile phone, refrigerator

CNY = yuan, HH = household.

Note: One sheep can be sold around CNY300.

Source: Household interview, April 2006

21. Total 70.94 mu or 4.73 ha of (non-irrigated) grassland has been temporally occupied for a maximum period of 3 years which affected 7 households or 42 people. Total CNY42,564 was paid to affected households by the Project 1 through Sunan County Grassland Management Office. Generous compensation was made, which was based on 10 times of average annual output value (AAOV) of grassland. Average size of land occupation is about 10 mu, which is an insignificant size of land compared to their grass land holding size (5,000 mu). The occupied land is expected to be return in original condition to the affected households by the end of 2009.

22. **Benefit and Concern.** Affected households expressed that they have been benefiting because of the Project 1 access road. Before construction of access road, there is only a trail to get to the nearest camp for herding. They used to carry the tent and other goods by horse. It used to take 3 to 4 days but currently only half day by truck. One household was affected by demolition of their seasonal herding camp. The Project 1 helped in the construction of permanent herding camp for them, and they appreciated it. Both affected households benefited from the Project 1 since it made it possible to use a mobile phone during the herding season. Mobile signal tower was constructed by the telecommunication company since the Project 1 entered this area. Affected households expressed that there is no concern on the Project.

23. **Gender and Development.** Women have an equal right as the men enjoys in terms of land holding. In the Project 1 affected community, women are generally engaged in household matters and taking care of crop land, while men are absent from the house for 6 months for herding. Both wives of affected households attended the consultation meeting to be informed about the land acquisition and the Project. Women expressed that they appreciated the better road access to the city and the mountain brought by the Project. Both husband and wife mutually agreed to use the compensation fund for (i) building fences in grassland, (ii) education for children, and (iii) purchasing feed for domestic animals.

24. **Downstream Impact.** The main downstream water use for the Heihe River is irrigation, which accounts for 78% of water flow. As the Project 1 is a "run-of-the-river" HPP, and will not reduce the natural flows downstream of the Scheme, there is no significant impact to the downstream communities for their water use for irrigation purpose.

## V. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

### A. 1<sup>st</sup> Stakeholder Consultation

25. In July, 2004, during preparation of the environmental impact assessment report, the Gansu Environmental Protection Research Institute conducted a series of stakeholder consultation exercises for the Project. The stakeholder consultation exercises consisted of the following:

- (i) Disseminating Project 1 information to the public through print media;
- (ii) Holding consultation meetings with relevant government agencies, including QNNR Administration, Sunan EPB, Sunan Forest Bureau, Sunan Civil Affairs Bureau, Zhangye City EPB, Zhangye Ganzhou EPB, Heihe Hydropower Company, Gansu EPB, First Railway Design Institute, Atmosphere Branch of China Academy of Sciences, Lanzhou University, Gansu Hydropower Design Institute, and Lanzhou Dry Climate Research Institute;
- (iii) Randomly issuing 100 public consultation questionnaires in the Project 1 area.

26. The public consultation questionnaires were distributed in July 2004 by Gansu Environmental Protection Research Institute in the immediate Project 1 area, Sunan urban areas, as well as select government departments of Zhangye City. The multiple choice questionnaire was issued to 100 people with 100 valid responses. It is considered that the survey covered a sufficient number of respondents in the Project 1 area and covered a representative demographic cross section. A breakdown of the respondents is provided in Tables 6 and 7.

**Table 6: Summary of Survey Respondents**

Classification		Persons	Percentage (%)
Amount of persons surveyed	Male	83	83
	Female	17	17
	Total	100	100
Age distribution	<25	4	4
	25-45	28	28
	46-55	45	45
	>55	14	14
Education level	Junior high school of below	48	48
	Senior high school and technical secondary school	11	11
	Junior college or above	41	41
Occupation structure	Worker	25	25
	Farmer and herdsman	20	20
	Technical personnel	5	5
	Urban resident	10	10
	Teacher and student	20	20
	Representative of People's Congress and Political consultation member	7	7
	Environmental experts and other	3	3

Source: Erlongshan Environmental Impact Assessment, Gansu Provincial Environment Protection Research Institute, Oct 2004.

27. Based on the survey, 98% of the respondents had a positive attitude towards development of the Project 1, and 2% answered negatively.

**Table 7: Survey Results**

No.	Survey content		Persons	Percentage (%)
1	Do you think the Project 1 can promote local economic development?	Yes	95	95
		No impact	5	5
		Hinder economic development	0	0
2	What is your attitude of the Project 1?	Very necessary	54	54
		Necessary	44	44
		Unnecessary	2	2
3	How do you think the Project 1 will impact your living quality?	Increase	77	77
		Decrease	2	2
		No impact	18	18

Source: Erlongshan Environmental Impact Assessment, Gansu Provincial Environment Protection Research Institute, Oct 2004.

## B. 2<sup>nd</sup> Stakeholder Consultation

28. In March 2006, ADB project preparatory technical assistance consultants conducted a series of stakeholder consultation exercises for the Project. The stakeholder consultation exercises consisted of the following:

- (i) Individual interviews were conducted on 2 March 2006 with affected households from Louzhuangzi village;
- (ii) Questionnaires were conducted with 20 local residents from Louzhuangzi village. The main concerns of the stakeholders include the loss of grassland, ecological environment protection along the river section with reduced water flow, storage of waste rock and wastewater pollution of the Heihe River.

29. Separate discussions were held with two households who traditionally herded sheep in the vicinity of the Project 1 during August and September each year and will have access to pastureland reduced because of the Project.

30. The questionnaire results indicated that 100% of the people surveyed agree with the construction of Project 1. The main social concerns were that effective measures should be taken to control the activity of temporary construction workers should be strictly restricted. The results of the questionnaire are summarized in Tables 8 and 9.

**Table 8: Summary of 2<sup>nd</sup> Survey Respondents**

	Classification	Persons	Percentage (%)
Amount of persons surveyed	Male	16	80
	Female	4	20
	Total	20	100
Age distribution	<25	2	10
	25-45	10	50
	46-55	7	35
	>55	1	5
Education level	Junior high school of below	15	60
	Senior high school and technical secondary school	4	20
	Junior college or above	1	5
Occupation structure	Doctor	1	5
	Farmer and herdsman	19	95

Source: PPTA Consultants Survey, March 2006.

31. Many of respondents answered that job opportunities for herdsman families should be maximized. A summary of the survey results are presented in Table 9.

**Table 9: 2<sup>nd</sup> Survey Results**

No.	Survey content		Persons	Percentage (%)
1	Do you think the Project 1 can promote local economic development?	Yes	20	100
		No impact	0	0
		Hinder economic development	0	0
2	What is your attitude of the Project?	Very necessary	17	85
		Necessary	3	15
		Unnecessary	0	0
3	How do you think the Project 1 will impact your living quality?	Increase	20	100
		Decrease	0	0
		No impact	0	0

Source: PPTA Consultants Survey, March 2006

### C. Expectations

32. **Raising the Tax Revenue.** Once the Project 1 is completed, CNY2.6 million of tax will be received by the County Government and this will greatly enhance the governmental capacity to combat poverty and to increase development.

33. **Improving the Transport Condition.** In the past, the road from Xishui township to Zhangye City (74 km distance) was difficult to travel and local people suffer a lot in going to school, hospital, finding jobs and buying necessities. Improved road condition made this area more accessible and there is now daily bus service for people to commute to the city.

34. **Improving the Communication Facilities.** Before, the land line telephone was poor and there was no mobile coverage in this area. Since the presence of the Project 1 in this area, those communication facilities have been improved or made available.

35. **Affordable and Reliable Electricity Supply.** Electricity supply was not reliable in the past and not affordable (CNY0.9 per kilowatt -hour). Since the presence of the Project 1 in this area, the electricity supply has been more stable (maximum black out is not more than 1 hour) and electricity price has gone down by half (CNY0.47 per kilowatt-hour).

36. **Job Creation.** The local people expect to be hired as manual laborers for the Project 1 construction. They can earn CNY25 to 30 per day from this type of work.

### D. Concerns

37. **Public Safety.** Increased truck traffic in the Project 1 area has caused some livestock to be killed. Also some livestock are being stolen, which has never happened before the presence of the Project.

38. **Noise and Dust Pollution.** Local climate is often very dry and the construction road has not been well paved. Sometimes heavy trucks in high speed raise horrible dust that pollutes the grass, crops and certain section of the river water. This also presents a serious danger to the local herdsmen, their school children, and the herds. The noise of the trucks also affects school teaching sessions by the roadside.

## VI. GRIEVANCE REDRESS

39. The consultation with the affected persons was conducted in January and December 2005. The affected households attended to the land measurement survey for land acquisition and verified the land to be acquired and compensation standard was discussed. A copy of survey result was given to the affected households.

40. Complaints and grievance procedures for land acquisition in PRC are well established. Grievances will first be lodged with the village committee. If no settlement is reached within 2 weeks, the complainant has 1 month to elevate the grievances to Xishui Township Government of Sunan County. If it remains unresolved within two weeks, the case can be sent to and settled by negotiation at the EHC Project 1 Office.

41. As of April 2006, EHC did not receive any single complaint on land acquisition.

## VII. REHABILITATION, INCOME RESTORATION, AND MITIGATION MEASURES

42. In general, the impacts of the Project 1 are very minor. However, the Project 1 provides the following entitlements to the households to increase their livelihoods and safeguard their community life:

- (i) **Short Term Job Opportunity.** A peak of 1,564 workers will be required at the Project 1 site during construction. Where possible, local labor will be used during construction activities. However, due to low population density of the area, there will be a shortage of skilled personnel. In order to encourage development of local industries to support the growing hydropower developments of the Heihe River, locally based suppliers will be used, where possible.
- (ii) **Maintaining and Watering the Access Road.** Although in the future there will be no less than six enterprises to use the only road in the Xishui Township, the Project 1 agrees to take responsibility of road maintenance during construction period and watering the road twice every dry day.
- (iii) **Strengthening enforcement of Workers Behavior.** The Project 1 agrees to strengthen monitoring the construction work, especially the behavior of the transporting vehicles on the road. It has installed a monitoring telephone (0936-6390006) and has promised to reward the impeacher, punish the violator, and compensate the suffered.
- (iv) **Respect the Tibetan Ethnic Culture.** The Project 1 agrees to train its employees and construction teams with local ethnic cultural knowledge, at the expense of the Project. In the case when the construction has to disturb the local Gods, the Company will invite local Lamas to perform the appeasing ceremonies. Meanwhile, EHC agrees to help maintain the Dharma Wheel Monastery as a local religious center.
- (v) **Road Safety.** The Project 1 agrees to establish more traffic signs in both Han and Tibetan. Also to reduce the inconvenience created by the heavy traffic due to the construction of the Project 1 and to enhance the safety on the road, the Project 1 will also spread the knowledge of road safety and it will supervise the construction team to store up materials beforehand, so that the traffic load will be reduced in the season when local herds are shifting between the upland and lowland grazing areas.

## VIII. LEGAL FRAMEWORK

43. This Resettlement Plan is in accordance with the PRC Land Administration Law (1998), the Grassland Law (1985) and relevant local government regulations, which clarify land rights and provide a basic legal structure and policy framework for addressing all land acquisition and

resettlement issues. This Plan also includes measures to ensure compliance with the social safeguards of the ADB.<sup>7</sup>

44. The Standing Committee of the People's Congress of Gansu Province approved the Administrative Regulations of Grassland of Sunan Yugur Autonomous County on 15 December 1995. The General Regulations state on page 12, item 6:

*“For the confiscation of natural grassland for construction use by the state or collectivities, the grassland compensation should be calculated based on the annual production of grasses, and the fee should be ten times that and should be paid at one time. For occupying artificial grassland the total investment for the grass construction should be added to the compensation fee, and also the livelihoods of herders should be properly arranged and the resettlement subsidies of the herders should be paid. The resettlement fee is settled by negotiation between the occupier, the affected households and the township and village governments and based on the replacement cost of permanent structures such as houses, animal sheds, sheep folds, etc.”*

45. The Executing Details for the regulations state on page 6, item 4:

*“For occupation of natural grassland needed for construction by the State or collectives, the grassland compensation fee and the herders' resettlement subsidies should be paid at one time, before occupation of the grassland. For the confiscation of artificial grassland and fenced grassland, the total investment for the construction of the artificial grassland and fenced grassland should be added. The compensation fee should be used in the grassland construction projects that are done by the district and township governments and passed through the husbandry administrative departments. The herders' resettlement subsidies should be given to the affected households. The collecting standard of grassland compensation fee and the herders' resettlement subsidies is constituted by the autonomous county government.”*

46. **Lost Housing and Assets on the Land:** Compensation for demolished or affected housing, other buildings, irrigation canals, fences, trees and young crops belonging to enterprises, collectives or individuals must be paid directly to the owners.

## IX. ENTITLEMENTS

47. The affected households received entitlement in accordance to the type of impact, their eligibility and compensation standards set out in Table 10.

**Table 10: Entitlement Matrix**

Type of Loss	Entitled Persons	Compensation and rehabilitation measures	Implementation Issues
<b>I. LOSS OF LAND USE</b>			
Permanently acquired grassland	Households with land use rights	10 times the value of the annual grass productivity (kg/mu x Y/kg)	Land registration and transfer fees will be paid by the Project 1 to the land user. No further taxes will be owed.
Temporary acquired grassland	Households with land use rights	10 times the value of the annual grass productivity (kg/mu x Y/Kg) After the construction is completed, the land occupied by the Project 1 will be restored by the Project 1 contractors and returned to the affected persons.	Land registration and transfer fees will be paid by the Project 1 to the land user. No further taxes will be owed.

<sup>7</sup> ADB's *Involuntary Resettlement Policy* and *Policy on Indigenous Peoples*.

Type of Loss	Entitled Persons	Compensation and rehabilitation measures	Implementation Issues
<b>II. LOSS OF ANIMAL SHED</b>			
Affected Houses and Structures	Registered owner of property	Compensation in cash for affected houses and structures based on size and quality of construction and compensation standards.	Compensation is at full replacement cost for labor and materials, without deduction for depreciation or salvageable materials.
<b>III. LOSS OF TREES</b>			
Scattered Trees	Owner of trees	Owner will be compensated based on type and age of tree and current market value.	Paid directly to owner (QNNR).
<b>V. REHABILITATION MEASURES</b>			
Special assistance for vulnerable households	Households categorized as vulnerable (very poor, single parent, elderly, disabled, or national minorities)	Households will receive priority for construction jobs and permanent staff employment for one member each. Households will receive priority for other poverty reduction programs.	

kg = kilogram, QNNR = Qilianshan National Natural Reserve.

## X. COMPENSATION STANDARDS

48. Following the national laws and provincial regulations and ADB policy, this Resettlement Plan has established entitlements, minimum compensation rates and rehabilitation approaches to address anticipated types of Project 1 impacts.

### A. Land Compensation

49. For permanent land acquisition, land compensation and resettlement subsidies are calculated in accordance with local regulations and the AAOV in the past three years. The agreed minimum standards are as follows:

$$\text{Grassland} = (6 + 4) \text{ times AAOV (100kg/mu times RMB 0.60/kg)} = \text{RMB 600/mu}$$

50. For permanent land loss, all agreed compensation, including land compensation and resettlement subsidies, was paid by the Project 1 to Sunan Grassland Management Office. Then, the Office made direct payment to the affected household.

51. For temporary land occupation, the Project 1 will make payments directly to affected persons for the time of occupation, based on average annual yield of different types of cultivated lands or grasslands. The compensation fee is 10 times the AAOV for the number of production seasons between when the land is taken and when it is restored in productive condition. The Project 1 will restore the land to its original condition.

## B. Other Assets

52. For demolished animal shed, the affected household is entitled to full replacement value of lost structures (including labor cost and without depreciation or deduction of salvage materials). The following are the minimum compensation standards to be used;

Seasonal herding camp = 80 yuan per m<sup>2</sup>  
Timber Trees = 180 yuan per piece (ø <20 cm)

53. The above compensation was paid directly to the affected household/owner. The herding camp was rebuilt as a permanent structure by the Project.

## XI. INSTITUTIONAL ARRANGEMENTS

54. EHC is responsible for the implementation of this Resettlement Plan, in accordance with the provisions stated herein as well as the relevant local laws. EHC assigns one resettlement officer to deal with implementation of land acquisition and liaise with affected households and other relevant government offices. Local government (Sunan Grassland Management Office and Township Government) is responsible for carrying out the formal land compensation and transfer procedures. This is handled by Xishui Township under the supervision of the Sunan County Land and Resources Office and Sunan County Grassland Management Office. Both EHC and Xishui Township are responsible for maintaining records of Project 1 impacts, compensation and related documents. The village committees will provide support to the affected households to ensure proper implementation, including information dissemination, adequate consultation, effective grievance procedures, asset measurement and valuation, compensation payments, and rehabilitation measures, skills training and employment. The Sunan County Audit Office regularly checks that compensation funds are properly administered.

## XII. COST ESTIMATE AND FUND FLOW

55. The cost for land acquisition was CNY76,264, of which permanent land acquisition was CNY31,100 and temporarily land occupation was CNY42,564. The itemized cost breakdown is shown in the Table 11.

**Table 11: Compensation Standard and Cost**

Item	Rate	Unit	Subtotal	Recipient	
Compensation Rate for Permanent Land Acquisition (CNY)					
1	Land Compensation/mu	600	43.5	26,100	Affected land users
2	Management Fee	5,000	1	5,000	Sunan Grassland Management Office
3	Total for Permanent LA			31,100	
Compensation Rate for Temporary Land Occupation (CNY)					
4	Land Compensation/mu	600	70.94	42,564	Affected land users
Other Assets					
5	Trees	180	10	1,800	Affected Owner (Sunan Grassland Management Office)
6	Seasonal herding camp (shed) – m <sup>2</sup>	80	10	800	Affected Owner
7	Total for Other Assets			2,600	
8	Grand Total (3+4+7)			<b>76,264</b>	

CNY = yuan.

Source: Erlongshan HPP Land Acquisition contract paper.

56. The 100% of land compensation was paid by EHC to the affected household's bank accounts through Sunan County Grassland Administration Office and witnessed by local officials on 6 January and 5 December 2005. The detail is shown in Table 12.

**Table 12: Payment Made to Affected Households by Permanent Land Acquisition**

Household	Base (CNY/mu)	Acquired Land (mu)	Other Assets (CNY)	Total (CNY)
1	600	17.84	800 (Herding Shed)	11,504
2	600	25.66	0	15,396
<b>Total</b>		<b>43.5</b>		<b>26,900</b>

CNY = yuan.

Source: Erlongshan HPP Land Acquisition Contract Paper.

### XIII. IMPLEMENTATION SCHEDULE

57. The actual schedule of land acquisition is shown in Table 13 below.

**Table 13: Schedule of Land Acquisition  
(As of April 2006)**

Item	Schedule	Responsible Agency
1. Approval of FS	2004.Nov	Gansu Provincial Government
2. Conducted Land Measurement Survey and Publicizing survey result to affected people	2005.Jan.05	SCGAO, EHC, STLV, AP
3. 1 <sup>st</sup> Pay compensation for the land acquisition to affected individuals to their bank account	2005.Jan.06	SCGAO, EHC
4. Approval of PD	2005.Nov	Gansu Provincial Government
5. Conducted Land Measurement Survey and Publicizing survey result to affected people	2005.Dec.02	SCGAO, SCMPG, EHC
6. 2 <sup>nd</sup> Pay compensation for the land acquisition to affected individuals to their bank account	2005.Dec.02	SCGAO, EHC, STLV, AP
7. Commencement of civil work for initial site preparation	2006.Jan	EHC
a. Loan Fact Finding	2006.Jun	ADB
b. Management Review Meeting	2006.Aug	ADB
c. Appraisal / Staff Review Meeting	2006.Sep	ADB
d. Loan Negotiation	2006.Oct	ADB
e. Board Approval	2006.Nov	ADB
8. Installation of equipments	2007.Jan	EHC
9. Resettlement monitoring and evaluation	2005.Jan onwards	EHC

ADB = Asian Development Bank, AP = affected people, EHC=Erlongshan Hydropower Company, FS = feasibility study, PD = preliminary design, SCGAO =Sunan County Grassland Administration Office, SCMPG = Sunan County Mati Peoples Government, STLV = Shixui Township Louzhuangzi Village.

### XIV. MANAGEMENT AND MONITORING PLAN

58. Following the requirements of the ADB, during the resettlement implementation, there will be both internal and external resettlement monitoring and evaluation exercises to ensure that all affected persons or villages are compensated adequately and that their incomes, livelihoods and living standards are fully restored or improved after resettlement and rehabilitation.

59. The internal resettlement monitoring will be carried out by EHC and Xishui Township. During the land acquisition stage, EHC and Xishui Township will maintain records of land acquisition impacts, compensation payments, employment in the Project 1 of affected households and other Xishui Township residents and grievances. Monitoring result will be included in the section of quarterly progress report submitted to ADB.

60. The Sunan County Land and Resources Bureau will conduct regular audits of the compensation activities. EHC and Sunan County will make records and reports available to ADB supervision teams.

61. EHC will contract an independent local monitor (e.g., a sociologist) for 8 weeks over 4 years to assess socio-economic progress and to carry out independent monitoring and evaluation of land compensation activities. The method of resettlement monitoring and evaluation will be based on household surveys, community group discussion and rapid appraisal in the field. The independent monitor will assess whether: (i) Project 1 implementation is in compliance with the policies and entitlements set out in the Resettlement Plan; (ii) the livelihoods of affected people have been fully restored; and (iii) the affected people have directly benefited from the Project. The independent monitor should make recommendations to EHC about how to improve implementation. The independent monitor will carry out (i) resettlement monitoring and evaluation once every year and prepare an annual monitoring and evaluation report for submission to ADB and (ii) ex-post evaluation 1 year after completion of land acquisition and prepare the report for submission to ADB. Table 14 provides a list of indicators to be monitored.

**Table 14: Monitoring and Evaluation Indicators**

Type	Indicator	Examples of Variables
<b>PROCESS INDICATOR (before and during implementation)</b>	Staffing	<ul style="list-style-type: none"> <li>EHC designates one person for community liaison to address any social issues during construction</li> </ul>
	Consultation, Participation, and Grievances	<ul style="list-style-type: none"> <li>Grievances by type and how they were resolved</li> </ul>
	Procedures in Operation	<ul style="list-style-type: none"> <li>Coordination between implementing agencies</li> </ul>
<b>OUTPUT INDICATOR (results of implementation)</b>	Buildings (none identified yet)	<ul style="list-style-type: none"> <li>Number and type of animal houses and yards demolished</li> <li>Number of meters of stone wall and of wire fence demolished</li> <li>Number, type and size of public facilities demolished</li> </ul>
	Compensation	<ul style="list-style-type: none"> <li>Grievances and resolution</li> </ul>
	Rehabilitation Measures	<ul style="list-style-type: none"> <li>Number of Affected Persons employed in Project 1 construction</li> <li>Delivery of other entitlements (allowances, support, staff employment)</li> <li>Adequacy of entitlements to restore livelihoods and incomes</li> </ul>
<b>IMPACT INDICATOR (post evaluation)</b>	Status of Household Livelihood	<ul style="list-style-type: none"> <li>Employment status of affected household members</li> <li>Changes to agricultural land area and productivity</li> <li>Changes to income levels and sources (stability)</li> <li>Changes to expenditures and savings/debt</li> <li>Number of Xishui men and of women employed in Project 1 construction and daily wage rates</li> </ul>
	Status of Women	<ul style="list-style-type: none"> <li>Participation in Project 1 construction</li> <li>Participation in new commercial enterprises</li> </ul>
	Local services and others	<ul style="list-style-type: none"> <li>Changes in electricity tariff, cost of domestic water supply, return transport to Huazhai and to Zhangye downtown.</li> <li>Improvements in quality of services (roads, frequency of electricity interruptions, water, access to medical clinics, access to middle school)</li> <li>Number of cases that livestock killed by truck and resolution</li> <li>Number of complaints on construction workers behavior</li> <li>Number of traffic signs on access road</li> </ul>

EHC = Erlongshan Hydropower Company.