

Guangxi Rural Poverty Alleviation Pilot Project

Environmental and Social Management Framework

Guangxi Foreign Capital Poverty Reduction Project Management Center

October 2016

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Foreword

The World Bank Loan Guangxi Rural Poverty Alleviation Pilot Project is a large integrated poverty reduction cooperation between the Chinese government and the World Bank, which has been included in October 2014 in the National Development and Reform Commission (NDRC) and Ministry of Finance (MoF)'s 2015-2017 World Bank candidate projects.

The proposed Project covers 10 counties in Baise and Hechi Cities. They are : Tiandong, Tianlin, Leye, Donglan, Bama, Fengshan, Dahua, Du'an, and Pingguo County, and Yizhou City. All of the selected counties/city are characterized by a particular high level of poverty combined with poor natural resource conditions, difficulties in water management, limited availability of farm land, low levels of technology and a high percentage of ethnic minorities. The objective of the Project is to increase income opportunities for rural households in selected poverty counties of Guangxi. This would be achieved by piloting innovative organizational arrangements. The total proposed investment is RMB117273 0000 Yuan among which US \$10000 0000 will be loaned from the World Bank. The Project includes four components: Improvement of Pro-Poor Value Chains; Enhancing Investments in Poor Areas; Increasing Investment in Poor Areas; and Project Management and M& E.

Implementation of the proposed Project is in line with China's and Guangxi's relevant policies. Since December 2011 when the Central Government promulgated and commenced China Rural Poverty Reduction and Development Program 2011-2020, the number of poor people of rural areas has largely decreased and infrastructure and services in poor areas have been improving, and as well economic development and farmers' income has been improving. By the end of 2014 China has still 14 special poor areas and 592 counties prioritized for the national poverty reduction program. At the same time, the number of poor villages was 128000; the number of poor households was 29485000 and the number of poor population was 70170000. The target for poverty reduction is: by 2020 economic development continues to increase and at the same time, under the current standards (average net income per capita is 2300 yuan according to constant price of 2010), the poor people in the rural areas are lift out of poverty, which means there are no more poor counties and food and clothing, as well as education, health care and housing for these people are secured; increase in disposable income per capita is higher than national average level and the indicator of public services is closed to national level.

The No.1 document of the Central Government in the 2016 declares that poverty must be terminated and to achieve this target, poverty reduction efforts must be accurate. For accurate poverty reduction, it is necessary to have different policies for different targeted groups. For 50000000 poor people actions such as industrialization, migration and resettlement shall be taken, and the other 20000000 poor people who are not able to work shall all be taken into the Low-Income security system, ie. implement social security policies to make sure all people are above the poverty line. A restrict poverty reduction responsibility and accountability system must be implemented at all government levels so that policies are sufficient, departmental cooperation is strengthened, and resources are allocated and social involvement is mobilized.

In 2015, the six session of the tenth plenary of the CPC committee of Guangxi Zhuang Autonomous Region issued *the decision on to win the 13th Five Year Poverty Reduction battle to carry out the major poverty reduction and development policies from the central government*, in which poverty reduction target is specified as: by 2020, the 5380000 people

under the current standards, the 54 poor counties(included the windows counties and policy treatment enjoyable counties) and the 5000 poor villages are all lift out of poverty. More specifically, in the first 3 years 1200000 people are lift out of poverty, the 4th year another 930000 people and in the 5th year the achievements of poverty reduction efforts shall be consolidated and all poor people are lift out of poverty.

It is needed to accurately identify poor households: set up a poor household dynamic adjusting mechanism and develop an accurate identifying indicator system which comprises comprehensive elements and priorities in line with the situation of the poor areas. The purpose is to accurately identify poverty in a bottom-to-top manner using such a system. Identifying poverty includes several steps and processes: visiting poor households, assessment, calculating, publicizing, reviewing and checking to make sure identification is open and transparent.

It is needed to accurately identify poor villages: Accurate poverty reduction takes sub villages as basic units. All 5000 poor villages are required to be accurately identified to find out the causes for poverty and what sort of efforts are needed to reduce poverty. As the causes for poverty of each household are different, support and efforts for poverty reduction should be differentiated. For villages with extremely fragile ecology and poor resources, infrastructure and public services, it is needed to develop resettlement plans. Accurate identification of poor households adopted strict processes, including twice household interviews, assessments, publicizations and reviews and one announcement as well as strict supervision on these processes, to make sure openness, transparency and fairness are involved in all processes.

It is important and necessary to set up mechanisms to identify villages and households who have got rid of poverty and how they should quit from the system, as well as standards, processes and follow-up policies. Accurate identification of villages and households who have got rid of poverty must be done each year at both government and household levels to make sure they are forced to be out of poverty.

Following *Guangxi's Main Function Zoning Plan*, Le Ye, Feng Shan, Dong Lan, Ba Ma, Du An and Da Hua Counties which have been selected as Project Counties, belong to the Major Ecological Areas, namely fragile but important ecological areas with limited environmental capabilities. These areas do not have the conditions for intensive and large-scaled industrialization and urbanization activities. Therefore, increasing productivity of ecological product should be prioritized and any intensive and large-scaled industrialization and urbanization activities must be limited. Tian Dong, Tian Lin and Yi Zhou Counties belong to the Agricultural Product Areas, namely with larger cultivated land area for agricultural development. These areas have conditions for intensive and large-scaled industrialization and urbanization activities. However, to achieve sustainability, it is recommended that increasing agricultural productivity should be considered as the major task and large intensive industrialization and urbanization activities shall be limited. The proposed project activities are in line with *Guangxi's Main Function Zoning Plan*.

1. Purpose and Scope of the Environmental and Social Management

Framework

Specific plans and scales of the Sub Projects have not been finally confirmed and the location and the detailed information are not known until the Project is commenced. However, according to the requirements of Environmental Impact Assessment (EIA) in World Bank's Security Policy OP4.01, it is possible to manage the environmental impact from the Project by the *Environmental and Social Management Framework* to make sure it is in line with China's laws and World Bank's policies.

The purpose of the *Environmental and Social Management Framework* is to provide guide to implementing agencies in Guangxi and the proposers of the Sub Projects in conducting environmental and social screening and follow-up evaluation of Sub-Projects, including detailed Sub Project Plans following World Bank Policies and China's laws and regulations.

The scope of the Framework includes environmental and social screening to identify the categories of the Sub Projects and the potential environmental and social problems and specified plans for the Sub Projects. As well, it should include a Generic Environmental Management Plan, a Resettlement Policy Framework, a Pest Management Plan and a Ethnic Minority Development Framework which shall be the main body or attachments of the Framework.

- The Generic Environmental Management Plan applies to sub projects which would have impact on the environment during the implementing and operational periods, including implementers, supervisors and monitoring agencies. It is needed to have extra measures to meet environmental protection requirements if the Generic Environmental Management Plan does not fulfill requirements of Sub Projects.
- The Resettlement Policy Framework applies to Sub Projects which create resettlement, including the whole process of resettlement, will used by the implementers, supervisors and monitoring agencies.
- The Pest Management Plan applies to agricultural production subprojects, including how pests are prevented and controlled during the process of planting, will used by the implementers, supervisors and monitoring agencies.
- The Ethnic Minority Development Framework applies to minority groups involved in the Project. The purpose is to make sure minority groups are fully involved in activities such as planning and decision making.

2. Project Description and Sub-project Eligibility

The Project Development Objective (PDO) is to increase income generation opportunities through demonstration of value chain development models in selected poverty counties of Guangxi involving 10 Counties, ie. Ping Guo, Tian Dong, Tian Lin, Le Ye Counties in Bai Se City and Dong Lan, Ba Ma, Feng Shan, Da Hua, Du An and Yi Zhou (county-level city) Counties in He Chi City, including 54 Townships and 117 Administrative Villages.

The Project consists four Components: *Improvement of Pro-Poor Value Chains; Improvement of Public Infrastructure and Services; Increasing Investment in Poor Areas; and Project Management, Monitoring and Learning.*

2.1 Description of the Project

The Project comprises four components. Sub projects involved in environmental impact are activities under Component 1a Cooperative Development Fund (CDF) and Component 2a Rural Infrastructure.

The **Component 1a** CDF aims to strengthen the weak parts such as breeding, processing and marketing of agricultural production to enhance the establishment and development of cooperatives. Involved plants and livestock include Dragon Fruit, Mulberry, Mango, Bamboo, Camellia Oil, Kiwi Fruit, Tea Leaves, Walnut, Mulberry and Silkcoon, Wild Grape, Orange and Mandarin, Mushroom, Black Chicken, Yao Chicken, Bama Fragrant Pig and Goat. CDF will also support development of the tourism cooperative and small-scaled infrastructure managed at cooperative level.

The **Component 2a** will support small-scaled road upgrading, water supply and irrigation facilities. These small-scaled infrastructure will be managed by County and Township government investment.

The Business Incubation Centers under **Component 3** will not involve new infrastructure. Instead, it will use the existing offices and facilities.

Specific project description are described in below. The project would be implemented over a period of six years.

Component 1: Improvement of Pro-Poor Value Chains This component aims to address market failures in the development of agricultural and non-agricultural rural value chains and key industries with a particular focus on increasing the value of economic activities of targeted farmer cooperatives. Component 1 comprises the following two sub-components:

- a) *Cooperative Development Fund (CDF) (US\$57.91 million, of which IBRD US\$28.96 million), would provide grant financing to new or existing cooperatives (about 10 per county and 120 over the project implementation). The CDF would be managed by the selected farmer and non-farmer cooperatives who will implement their investment plans for value chain development. These investment plans would be initiated by cooperatives and formulated jointly with the help of technical experts, agro-enterprises, and county governments. Cooperatives would need to provide a beneficiary contribution at levels reflecting the financial capacity of the individual cooperatives. Investment proposals would be subject to appraisal and approval by the county and Regional PMOs. Funds could be used by the cooperatives to invest primarily in the fixed value adding production and processing equipment and facilities, nurseries, advanced breeding stations, equipment for improved seed*

production, storage facilities for agricultural produce, and other small-scale cooperative level infrastructure, goods, and related capacity building and technical assistance services. Depending on the actual needs of cooperatives, these investments may be associated with agricultural production (such as herbs, dragon fruit, kiwi, oil tea, etc), livestock (goats, pigs, chicken, etc), rural tourism, and related processing and marketing equipment and equipment, infrastructure and services. The component would also pay significant attention on strengthening of the institutional and management structures of the cooperatives. The project will allocate a proportion of the CDF fund for capacity building and training of cooperatives which would be mandatory before investments to economic activities will be made available. The cooperative training activities supported through the project would cover management and technical topics, and quality of the training activities delivered would be a special area of focus in the training plans. Specific measures would be taken to ensure participation of women in cooperatives both as individual members and in management boards. Furthermore, the governance structures of the beneficiary cooperatives must be aligned with the provisions of the cooperative law, and the CDF review and approval process will pay close attention to the proposed ownership structures to ensure equitable sharing of benefits. The project will monitor the institutional development aspects of farmer cooperatives by using the Management Effectiveness Tracking Tool (METT).

- b) *Matching Grant for Enterprises (MG) (US\$32.31 million, of which IBRD US\$32.31 million)* would provide matching grants to finance enterprise investments, which demonstrate linkages and benefit sharing arrangements with targeted cooperatives of poor farmers. It is expected that some 20-30 grants could be awarded to eligible enterprises individually or in partnership with farmer cooperatives. These grants will be identified during the project implementation. Numbers of poor farmers participating in value adding income generation activities and fair benefit sharing arrangements would be key selection criteria for such matching grants. The grants would be provided based on the application process which includes transparent evaluation and competitive selection process (the details will be defined in the Operational Manual). To ensure ownership and to demonstrate commitment, the selected enterprises would need to match the grant amount with their own funds at negotiated level of cost-sharing requirement which would need to come from the enterprises own resources and/or from commercial lending. The project will provide matching grants up to 30 percent from total investment cost. The matching grants aim to leverage private investments with strong public good characteristics, such as income-generating activities for poor farmers, and would focus on investment in the following key areas: storage and logistics systems; processing; marketing (branding, certification, etc.) and product quality (including food safety improvement). The management and implementation of this subcomponent would be done at the Regional level.

Component 2: Improving Public Infrastructure and Services. This component would support the establishment and strengthening of public infrastructure and service systems in support of value chain/key industry development under Component 1 and would include two subcomponents:

- a) Rural Infrastructure, which would be identified, to the extent possible, to complement the CDF investments under the Component 1. The component would support: (i) rehabilitation and construction of production road infrastructure, such as off-grade

access roads to village/cooperative production areas or processing and marketing facilities, and rehabilitation and construction of tractor roads, field tracks, and foot paths; (ii) rehabilitation and construction of small-scale irrigation and drainage infrastructure and construction of small water storage facilities; (iii) establishment of IT and telecommunication infrastructure and procurement of information infrastructure and equipment; and (iv) rehabilitation or construction of public market facilities, electricity supply and other infrastructure and procurement of related equipment.

- b) *Risk management (US\$9.21 million, of which IBRD US\$9.21 million)*, which would support the development of value chain or industry-level comprehensive risk assessment and risk mitigation plans for a clusters of counties. The plans would consider: (i) production risks (e.g. natural disaster, outbreaks of diseases, etc.), (ii) marketing risks including potential risk of food safety and food quality violation and the impact on consumer trust by the project beneficiaries or outside fellow producers/suppliers, and (iii) financial risk such as cash flow constraints and working capital requirements. The risk management and mitigation plans would identify responsibilities of public and private stakeholders (and main audience of these plans), such as producers, processors, food safety testing and quality institutions, insurance companies, etc. and identify gaps and bottlenecks, which will be addressed under the project. The project investment would follow priorities identified in the risk mitigation plans and could include, *inter alia*, investments in food safety testing and control (tests according to a testing regime or if necessary additional training and equipment for the related public sector testing/controlling institutions, such as FDA offices), initial subsidies for crop and livestock insurance schemes etc. as part of the risk management plan implementation. Marketing risks mitigation support could include developing and registration and protection of local/regional brands, geographical indication as well as strategic product marketing and promotion. The component would finance mainly TA and consultant services, equipment and crop and livestock insurance subsidies.

Component 3: Enhancing Investments in Poor Areas. This component would improve and facilitate investments in poor areas by existing and new micro-entrepreneurs and business entities, such as Small and Medium Enterprises (SMEs), migrant returnees, or cooperatives and would include two activities:

- a) *Business Incubation (US\$8.55 million, of which IBRD US\$8.55 million)*, which would support the setting up and operation of Business Incubation Centers (BICs) in each county, which will provide support for existing and start-up businesses. The BICs would support development of marketing skills and enable market linkages by reducing information asymmetries, building trust, and creating shared value between value chain actors. They would also provide training for financial management skills and help enterprises with access to appropriate financing products by facilitating linkages with partnering financial institutions. In addition, BICs will offer business development services such as training (business management, business planning), and provide assistance with navigating regulatory requirements, standards, and compliance. Other services could include promotion of business networks and fairs and media events to promote the products of participating enterprises. Finally, the BICs would offer to their clients office facilities and meeting rooms with reliable internet connection to enable sales, procurement, and management functions to operate in a professional environment. The component would provide seed funding in the form of grant but the BICs are expected to become financially sustainable over

time through generation of its own revenue to reach a point where it can cover its on-going operating expenses through earned revenues. The component will finance equipment, TA and related consultancy services, necessary office equipment and operating costs associated with running of business incubation centers (e.g. 100% during year 1-2 and 50% from year 3 onward).

- b) *Improved Access to Financing* will support, in cooperation with local finance institutions, the scaling-up of the government program of a comprehensive household credit rating piloted in Tiandong county and the validation of rural assets, which would help individual households and cooperatives accessing loans from local finance institutions. Credit rating will be done on a biannual basis (twice under the project) for all households in the project villages. The validation of assets, which can be used as collateral, will help cooperatives to access loans including loans for working capital. The project support of the credit rating would be output based with a prior agreed payment per each rated household for the rating teams. For the rural asset validation the project would engage and support professional service providers such as asset validation firms or accounting companies.

Component 4: Project Management, M&E and Learning. This component would aim to strengthen and develop the administrative and technical capacity of staff of the Project Management Offices at the county, prefecture and regional level to manage the project effectively. The component would in particular aim to establish a monitoring and evaluation and impact evaluation system in order to enable the learning from the pilot nature of the project with an external professional monitoring agency to be engaged under the project. The component would also support regular supervision, progress monitoring, acceptance checks, and safeguards implementation supervision and monitoring.

2.2 Project Eligibility

Considering the poverty reduction nature, the type and scale of proposed activities, and the social and environmental features of project area, the project was assigned category B during the World Bank concept stage safeguard review. Namely, sub projects adopted into the Project should not be Category A in accordance with World Bank's safeguard policy OP4.01, Environmental Assessment, should not have any major potential impact on the environment. Annex 1 provides principles and examples for screening of environmental assessment classifications, which will be used for screening sub projects in the future. Below is a description.

- World Bank safeguard policies which apply to the Project include the *Environmental Assessment* in OP4.01, *Nature Habitats* in OP4.04, *Pest Management* in OP4.09, *Indigenous People* in OP4.10 and *Involuntary Resettlement* in OP4.12. Sub projects which are found to involve other environmental and social safeguards policies to be applied to the Project in the screening process, will not be supported by the Project;

- The Project is classified as B project. Its reverse environmental and social impact should be limited, partial, temporary and not beyond the implementation locations. As well, it should not have impact on the critical natural habitats and cause change or degradation. During the environmental and social screening process, if any sub project does not meet the above conditions it should not be included into the support of the Project;

- In addition to above-mentioned safeguard policy requirements. China's Environmental Assessment Law and applicable regulations provide of limitation of scale and

the definitions environmentally sensitive areas that should be considered in screening subprojects. These regulations include *Management Directory of Environmental Impact Assessment (EIA) Categories for Construction Projects 2015* which can be used to identify the depth and the breadth of environmental assessment, and the *Directory of Construction Projects not Included in Review and Approval of Environmental Impact Assessment* issued by the Environmental Protection Department of Guangxi. Details of the above Directories are indicated in Table 2.2-1:

Table 2.2- 1 Sub Projects not in compliance with Project Eligibility Conditions (Domestic requirements for type, scale and sensitivity)

Project Category	Scale	Meaning of environmentally sensitive areas in this column
Agricultural production	5000 Mu and above; in environmentally sensitive area	Nature reserve, Scenic spots, the World Cultural and Natural Heritage, the drinking water source protection areas; basic grassland, important wetlands, water resource area, Erosion control, and Eutrophic waters
Farm product bases	All	Nature reserve, Scenic spots, the World Cultural and Natural Heritage, the drinking water source protection areas; basic grassland, important wetlands, water resource area, Erosion control, and Eutrophic waters
Livestock and poultry farms, farming community	Annual number of pigs: 500 (other livestock equivalent number of pigs)	Nature reserve, Scenic spots, the World Cultural and Natural Heritage, the drinking water source protection areas, Eutrophic waters; residential areas with facilities for health care, education, culture, studies, administration and office; Cultural relics protection units, protected areas with special historical, cultural, scientific and ethnic significance.
Food and feed processing	Annual processing 250,000 tons and above; with fermentation process	NA
Plant oil processing	Annual oil producing 300000 tone and above; Annual plant oil fine processing 100000 tone and above	NA
Slaughter	Annual slaughter 100000 heads (or 1000000 poultry) and above.	NA
Production of vegetable and fruit juice and other soft drink	Production of original juice	NA
Roads	New road construction or upgrading; 1km or above independent tunnels in environmental sensitive areas, 1km or above independent bridges in environmental sensitive areas (not including road maintenance)	Nature reserve, Scenic spots, the World Cultural and Natural Heritage, the drinking water source protection areas; basic farmland and grassland, forest parks, geoparks, important wetlands, water resource area, and Eutrophic waters ; Natural forests, rare and endangered wild animals and plants naturally concentrated area, the natural spawning grounds of important aquatic organisms, feeding grounds, winter grounds and migration routes, natural fisheries, water resource area, Erosion control, and land desertification protected areas, closed and semi-enclosed seas, eutrophication of waters; residential areas with facilities for health care, education, culture, studies, administration and office; Cultural relics protection units, protected areas with special historical, cultural, scientific and ethnic significance.
Warehouses (excluding oil tanks, gas storage, coal storage)	Toxic, hazardous and dangerous goods warehousing, logistics and distribution projects	NA

Tourism	Cable car, ropeway construction; marine entertainment and sports, landscape development project	NA
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3 Legal, Policy Framework and Gap Analysis

3.1 Applicable Country Laws and Regulations

Domestic legislation and regulations applicable to the Project:

- (1) Environmental Protection Law of China (2015);
- (2) Environmental Impact Assessment Law of China (2002);
- (3) Water Law of China (2002);
- (4) Agriculture Law of China;
- (5) Animal Husbandry Law of China;
- (7) Water Pollution Control Law of China (2008);
- (7) Forest Law of China (1998)
- (8) Solid Waste Pollution Control Law of China (2005);
- (9) Noise Pollution Control Law of China (1996);
- (10) Atmospheric Pollution Control Law of China (2000);
- (11) Water and Soil Conservation Law of China (2010);
- (12) Wild Animal Protection Law (1988);
- (13) Cultural Relics Protection Law of China (2002);
- (14) Land Management Law of China (revised in 1998);
- (15) Mineral resources of China (revised in 1996);
- (16) Cleaner Production Promotion Law of China (2002);
- (17) Nature Reserve Regulations of China (1994);
- (18) Implementation Regulations for Water and Soil Conservation Law of China (1993);
- (19) Wild Plant Protection Regulations of China (1996);
- (20) Implementation Regulations for Aquatic Wildlife Protection of China (1993);
- (21) List of National Key Protected Wildlife (1989);
- (22) Regulations for Safety of Place of Origin for Farm Products;
- (23) Animal Plague Control Law of China;
- (24) Regulations for Pollution from Large-Scaled Animal Husbandry;
- (25) Regulations for Feed and Feed Additive Management;
- (26) Regulations for Emergency Animal Diseases;

3.2 World Bank safeguard policies and environmental health and safety guidelines

Compliance with the World Bank safeguard policies are summarized in Table 3.2-1.

Table 3.2-1 Analysis on Compliance of the Project with World Bank Policies

No.	Policy	Applicable	Note
1	OP 4.01 Environmental Assessment	Yes	Category B, <i>Environmental and Social Management Framework</i> prepared, Information disclosure and public participation undertaken, according to OP4.01
2	OP 4.04 Natural	Yes	The policy is triggered because of the location and nature of the proposed project activities. Agricultural production and

	Habitats		small scale infrastructure related activities are likely to have limited impacts on natural habitats. Sub-project screening criteria includes the requirement on avoidance of critical natural habitats or potential significant impacts on natural habitats. The generic EMP includes measures to mitigate impacts on natural habitats. The project will not involve significant degradation or conversion of any critical natural habitats.
3	OP 4.09 Pest Management	Yes	While the project does not finance directly pesticides and agrochemicals, increased level of agricultural production activities may lead for farmers to use pesticides using their own funds. The pesticides uses for this project would be limited for the following considerations: 1) agriculture products to be involved in the project are all perennial plants that are diverse and are adapted to local ecological environment. Compared to annual crop production, pesticide uses are anticipated limited; 2) the project is to promote advanced agricultural technologies to improve quality and good practices (organic and green food) to bring value-added. The pesticide use will be limited to several agricultural product such as orange and most species do not need the use of pesticide. The PMP is to minimize and guide the use of pesticide where necessary.
4	OP 4.11 Physical Cultural Resources	No	The project doesn't involve any physical cultural resources. Sub-project screening criteria includes the requirement on avoidance or potential significant impacts on PCRs. Chance-finds procedures are included in the EMP.
5	OP 4.36 Forest	No	The project will support agricultural production and involved plants are diverse. Only several are fruit trees (such as mango and orange); others include shrubs (e.g. oil tee) and veins (e.g. dragon fruit and grape). Even for former, the scale will be limited and the locations to be identified during implementation. The project will not support massive plantation either. Hence the policy is not triggered.
6	OP 4.37 Safety of Dams	No	The project will not involve any dams. Water tanks to be supported by the project are those small storage facilities with a capacity range from several to dozens of cubic meters that will store rain water. Channels will be built to direct the water for household and/or irrigation use. In the karstic part of the project area, precipitation is adequate but due to porous karstic geology it is difficult to keep surface water system, hence these kind of water tanks are proved useful and are common in the project area.
7	OP 4.12 Involuntary Resettlement	Yes	Resettlement Policy Framework is prepared
8	OP 4.10 Indigenous Peoples	Yes	Minority Group Development Plan is prepared
9	OP 7.50 Projects on International Waterways	No	No international waterway is involved
10	OP 7.60 Projects in Disputed Areas	No	No disputed area is involved

The World Bank Group's Environmental, Health and Safety Guideline covers a range

of agriculture-related guidelines. It is needed to note that the agricultural products involved in the Project, e.g. Dragon Fruit, Kiwi Fruit, Camellia Oil, are all perennial plants. These activities are scattered and of small scale. The project is to increase production and quality by agricultural techniques such as grafting and transplantation, which will not involve large-scaled land preparation. Farm product processing will not involve brewing or juice processing except for primary squeezing process of camellia oil. Chicken and pig farms are household based rather than large scaled farms. Slaughter and meat processing are not involved. Therefore, some of the measures in the *Environmental, Health and Safety Guidelines for Perennial Crop Production*, the *Environmental, Health and Safety Guidelines for Mammalian Livestock* and the *Environmental, Health and Safety Guidelines for production of plant oil*, are applicable for the Project. The following provides an analysis on the compliance of the Project with the Bank's policies.

The EHS Guidelines applicable to the Project and Project compliance are summarized in below table:

Table 3.2-2 Analysis on Compliance of the Project with WBG EHS Guidelines

Project Activities	Measures required by EHS Guidelines	Measures of the Project
Agricultural Production	<p><i>Environmental, Health and Safety Guidelines for Perennial Crop Production:</i> A series of best environmental management approaches and measures are proposed for erosion control, soil quality protection, plant waste disposal, irrigation management, pest management and the use of pesticides, fertilizers, biodiversity protection, energy use, air quality, greenhouse gases and other occupational safety.</p> <p><i>Environmental, Health and Safety Guidelines for production of plant oil:</i> A series of best environmental management approaches and measures are proposed for solid waste control and by-products processing, water consumption, energy control, emissions, greenhouse gas emissions and hazardous waste.</p>	<ol style="list-style-type: none"> 1. Soil and water conservation measures include avoiding large-scale excavation, especially in karst areas, effective use of existing topography for agricultural production, try not to convert land use; 2. Protection of soil quality and use of fertilizer: promotion of the use of farmyard manure and organic fertilizer, and increase of the proportion of organic fertilizer and green manure. It is prohibited to apply fertilizer on soil surface. Fertilizer must be applied in inside of ditches and holes. Cover fertilizer with soil and straws immediately after it is applied 3. Reduce pesticide use. When it is needed, use efficient low-residue pesticides. It is prohibited to use highly toxic and long residual pesticides. Pesticide use should give priority to pollution-free pesticides, see Pest Management Plan 4. Water pollution control: avoid application of fertilizer and pesticide in raining season to reduce pollutant running into surface water. 5. Waste management approach: Waste plastic bags, fertilizer bags, pesticide bottles, plastic film from planting activities are prohibited to be left in the field. They must be collected and disposed collectively. 6. Use of energy and mitigation of green gas: 以 activities are based on man power with low energy intensity. Calculation shows significant results in mitigating green house gas emission 7. Biodiversity: little impact on biodiversity as the Project supports the existing species in project areas. 8. Milling of camellia oil is small-scaled and scattered on household basis. The main residue can be used for compost.
Animal Husbandry	<p><i>Environmental, Health and Safety Guidelines for Mammalian Livestock Environmental, Health and Safety Guidelines for Poultry Production</i></p> <p>A series of best environmental management approaches and measures are proposed for waste management, wastewater treatment, emissions,</p>	<ol style="list-style-type: none"> 1. Solid waste disposal measures include using biogas tanks to produce biogas and residue which will return to the field. Shelters will be set up for rain and not to scatter. Animal bodies will be collected and disposed by specialized agencies. If there is no such agency, the bodies will be buried. .

	use of antibiotics and fungicides, ecological impact, animal diseases and occupational safety	<p>2.Waste water. Waste water from livestock or poultry farms is prohibited to enter surface water. It should go into biogas tanks or treatment facilities and then into the field</p> <p>Stalls, waste tanks, biogas tanks, sewers and disposal facilities must be lined to avoid leaking and polluting groundwater.</p> <p>3.Waste gas. Waste gas in production areas must be cleaned in a timely manner to reduce the time manure and rotten feed expose. Regular cleaning must be undertaken in stalls before odor is created; dry up stalls as soon as possible and spray deodorant regularly.</p> <p>4.Veterinary. Choose popular, efficient and low-toxicity medicine for sterilization.</p> <p>5.To protect the ecological environment of the degraded karst areas, it is prohibited to build stalls, digging, quarry and deforestation. Grazing on mountains is banned. Pasture development is encouraged to reduce stock capability on natural grassland.</p> <p>6.Disease prevention and control. Set up a regular sterilization system; an immunization program for avian flu and foot an mouth disease; keep records of immunization; monitor results of immunization; kill livestock with avian flu and foot and mounth disease, no treatment shall be given to disease livestock.</p>
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3.3 Gap Analysis

The proposed project is a World Bank loan project. It is needed to follow not only the Bank's safeguard policies, but also the host country China's laws and regulations. It is intended to review the gap analysis between the relevant Bank's policies and China's laws and regulations and their requirements. During the project preparation, desk review and discussions with the Guangxi Regional Environmental Protection Department were conducted. It is noted that in terms of the development of environmental assessment, there is no significant gap between domestic and the World Bank safeguard policy requirements.

On the depth and document type. The difference are the following,

Statement in Chinese EIA Law,

Project owners must prepare EIA reports, tables or registration forms (EIA documents hereafter) in accordance with the following mandates):

- (1) If a project has potential major environmental impact, it is required to prepare an EIA report, providing comprehensive assessment on the potential impact;*
- (2) If a project has potential mild environmental impact, it is required to prepare an EIA table, providing assessment or special assessment on the potential impact;*
- (3) If a project has a little potential environmental impact, it is required to fulfill an EIA registration form instead of preparing an EIA report.*

While the OP4.01 assigns A,B,C and FI to projects according to the scale and scope of potential environmental and social impacts. Category A refers to project likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may

affect an area broader than the sites or facilities subject to physical works. Category B refers to project potential impacts on human population or environmentally important areas are less adverse than those of Category A projects. Category C is likely to have minimal or no adverse impacts.

On the EA documents, OP4.01 stipulates more forms. EIA and EMP are common forms, and the World Bank projects particularly put emphasis on EMP implementation. For projects of which the location and scale are not determined during preparation, an environmental and social management framework can be prepared. For some simple B projects, EMP can be adequate.

On public consultation and information disclosure, domestic requirement converges with OP4.01 in recent years. Broad consultation and full document disclosure are required.

Other domestic regulations correspond to safeguard policies applicable to the project as well. For example, corresponding to OP4.09 Pest Management, Regulations on Pesticide Administration and Regulations on Administration of Pesticides have been promulgated by the State Council, Standard for Safety Application of Pesticides by Ministry of Agriculture to encourage the high-effective use of pesticides with low toxicity and residue. All producers of pesticides must abide by the regulations, rules and standards as above during production. These documents clearly stated:

——Strict limits on application of pesticides for preventing animal diseases and plant pests during agricultural production (It is prohibited to use highly dangerous and toxic pesticides, such as quinalphos, monocrotophos, phorate);

——Agricultural products with excessive residues of the pesticides are prohibited to sell out;

——Methods on safe application of pesticides include: forms of pesticides, safety and appropriate using methods, normal and maximum doses, extreme application frequency in one year, and time period from last application to harvest.

Overall, there is no significant gap between China domestic regulations and World Bank safeguards requirements. More attention should be given to supervision, enforcement and capacity building during implementation.

4 Environmental and Social Background

4.1 Summary of Natural Environment

4.1.1 Location

The Project covers 10 Counties in Baise and Hechi Cities which are in the Northwest part of Guangxi, including Tiandong, Tianlin, Leye, Donglan, Bama, Fengshan, Dahua, Du'an, Pingguo Counties and Yizhou City (Locations are in Figure 1), with a total land area of 32672.5 square kilometers and a population of 4.0124 million. The Project Area is located in the joining area of karst mountains and flat land in Yunnan-Guangxi-Guizhou Karst Mountain area. The Project Area convers a mixed landscap of Karst mountains and soil hills. Survey shows that Karst landscapes take up 63% and 45% respectively of the two Cities.



Figure 1 Location of Project Area (Ten Counties in northwestern Guangxi)

4.1.2 Environmentally Sensitive Areas

Several sensitive areas are covered in the 10 Project Counties. Nature Reserves include: Chenwang Laoshan Nature Reserve in Langping Township Tianlin County; Orchidaceae Nature Reserve in Yachang Township Leye County. Scenic spots include Crystal Cave, Bai Niao Yuan and Panyang River in Bama County; Da Shi Wei natural pits in Leye County; Jin Lang Wan in Yizhou City; Liangfeng Cave in Donglan County; Qi Bai Nong in Dahua County. Geoparks include Leye-Fengshan World Geopark. However, sub projects of the proposed Project involves none of the above sensitive areas. Distribution of nature reserves is in Figure 2.

4.1.3 Surface Water System

Rivers running through Baise City: Youjiang River, Leli River, Xiyang River, Tuoniang River, Buliu River and Longxu River. Rivers running through Hechi: Longjiang River, Diao River, Red River, Panyang River, Baidong River and Ling Qi River. Surface water system of Project Area is in Figure 3. All Project Counties have domestic water protection areas. Therefore, sub project locations involve no domestic water protection areas. Details are in Figure 4-5.

广西壮族自治区 自然保护区分布示意图 Nature reserve distribution diagram of Guangxi Zhuang Autonomous Region



Figure 2 Distribution of Nature Reserves in the Project Areas

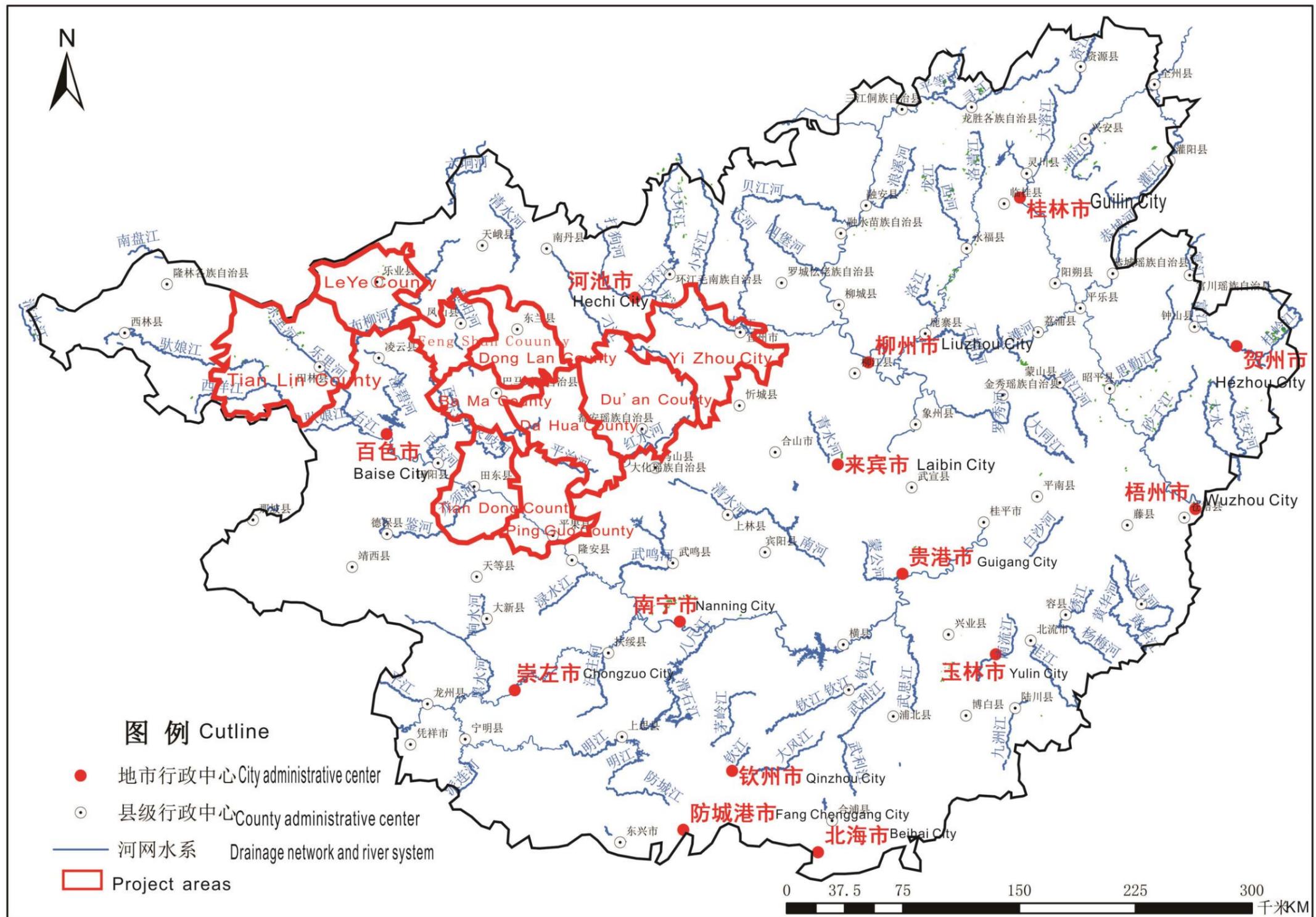


Figure 3 Map of Surface Water Systems in Project Area

河池市县级以上集中式饮用水水源保护区

地理位置 LOCATION Centralized drinking water sources reserve at or above the county level in Hechi City

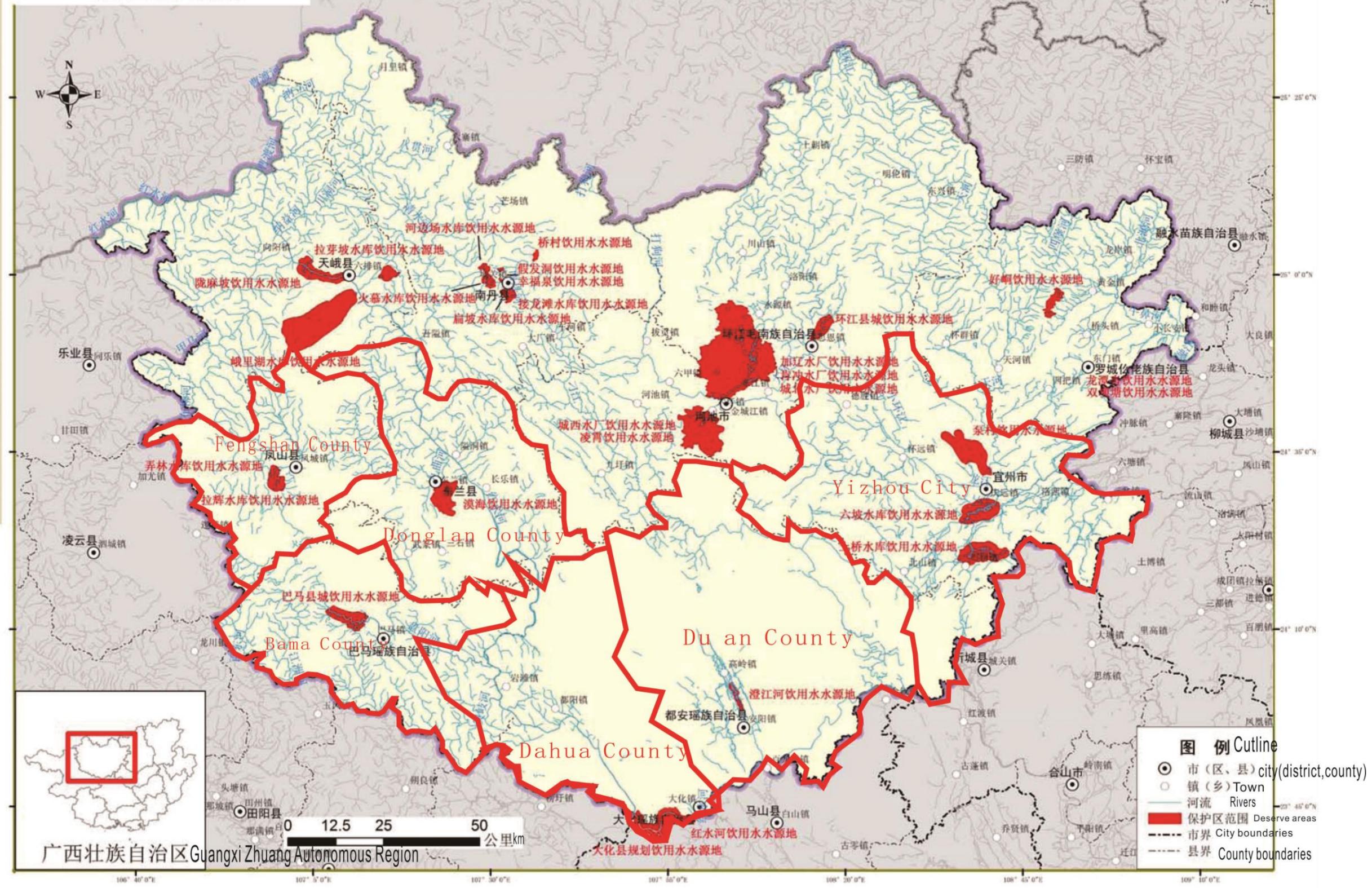


Figure 4 Distribution of Domestic Water Source Protection Zones in Hechi City

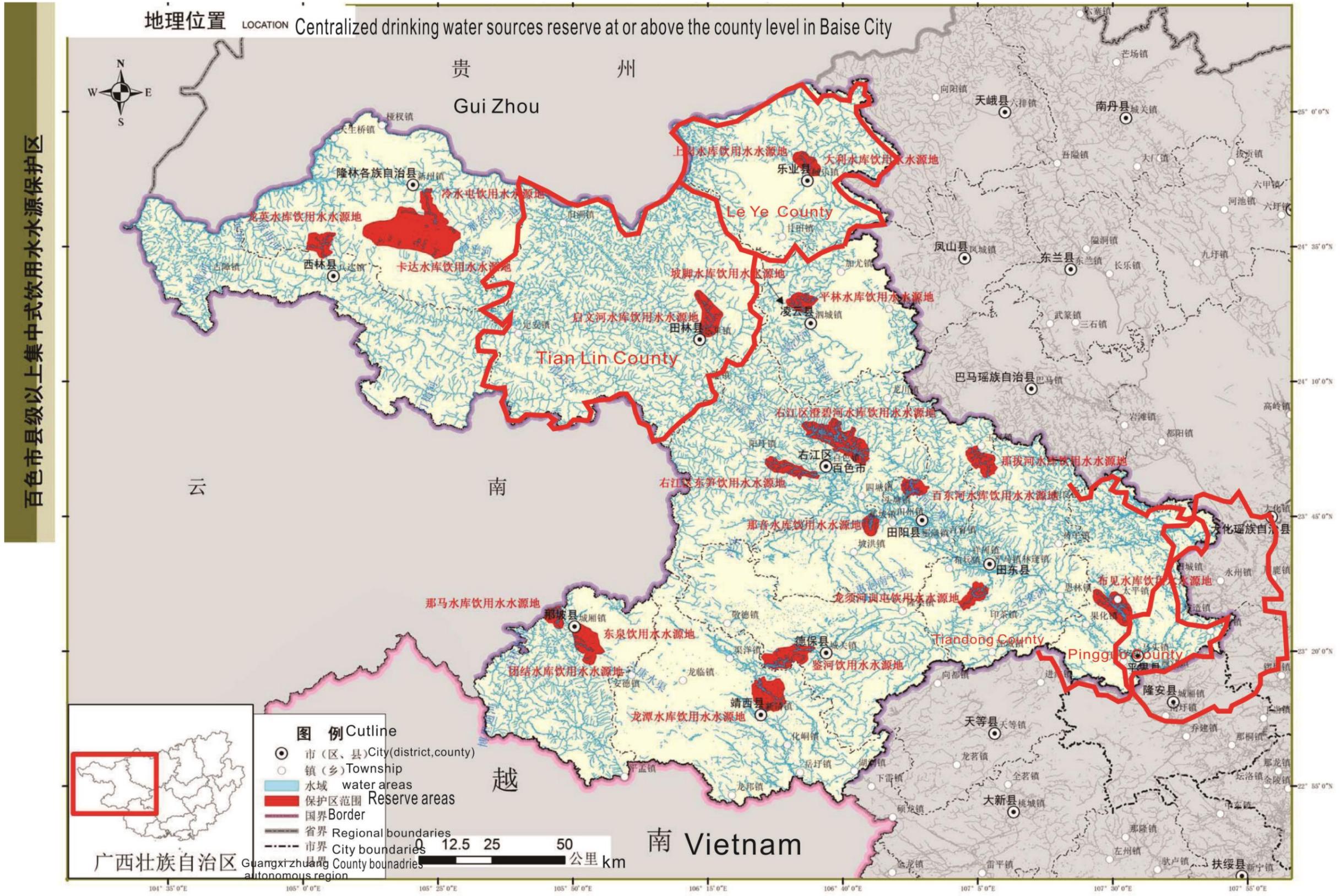


Figure 5 Distribution of Domestic Water Source Protection Zones in Baise City

4.1.4 Biodiversity

(1) The City of Baise is in sub-tropical area. It is warm all year round, with plenty of heat and rain. Most of the plants are evergreen and can grow through the year. Forest covers 2700 tree species. Cash trees include Fir, Pine, Oak and Bamboo as well as fast growing species, nearly 100 fast growing species including youtung, camelia, anise, tea and cinnamon. Rare and specious species include: Clams wood, gold plum, rosewood, dyke tree, cedar, Douglas fir, cedar iron Kennedy, plum, and leaf clams. Fruit species include banana, mango, almond, orange, pear, longan, plum, walnut, chestnut, persimmon, plum, litchi, hawthorn, pineapple, fruit safflower. Crops include rice, corn, soybeans. Cash crops include sugar cane, tea, tobacco, coffee. Herbs include 110 species: Tianqi, honeysuckle, Ganoderma lucidum, basil, Poria, Amomum, Radix, Huang Jing, ring grass and aspartame . Mushrooms include different fungus. Starch crops includemore than 20 varieties. Oil plants include 19 varieties such as sesame, peanuts, tea, tung oil, cubeba, canola and tallow tree. Fiber plants include 19 varieties. Chemical plants include more than 100 varieties such as niu ganzi, bayberry, mountain locust, Jacaranda trees, valonea. Aromatic plants include Magnolia, Osmanthus maudiae, rose, and vanilla. Pasture includes 93 varieties

The City of Baise has over 100 wildlife, including over 20 rare and protected species: loris, langurs, bears monkeys, rhesus macaques, clouded leopard, serow, forest musk deer, black deer, tufted deer, sambar, golden cat, civet, small Indian civet, pangolin, otter, south snakes, spot hornbill, silver pheasant, golden pheasant, copper chicken, duck, giant salamander (giant salamander), distributed in Jinxi, Xilin, Lingyun, Napo, Tiandong, Tianyang and Youjiang. Rare beasts such as Tiger, leopard, bear and spotted deer could be found in Tianlin and Leye Counties.

(2) The City of Hechi is located on the edge of the south sub tropic area, the transition area area between hilly area in Northwest Guangxi and the Yunnan-Guizhou Plateau. Forest vegetation comprises broad-leaf evergreens. Plants include 203 families, 697 genera and 1850 kinds and tree species include 84 families, 250 genera and 532 kinds, such as Camphor, Dutch, birch, alder, mangrove tree, neem, camphor, jujube, acuminate., among which 143 kinds are evergreen, 98 are deciduous trees , 60 are rare and protected species: White bean fir, Taxus, Amentotaxus clams, dyke tree, lobular red beans, gold Li, Ma Gua, Namu, incense trees, silver magpie, paliurus, Rhoiptele. Herbs include 162 species. Oil plants 16 species, feed plant 20 species, pasture 240 species and fiber plant 14 species.

Animal species in Hechi include over 60 species, among which 10 are national 1st class protected species, 23 are 2nd class and 11 are 3rd class protected species. Two are rare species and others 16 economic species.



Typical Natural Ecosystem in Baise



Typical Natural Ecosystem in Baise



Typical Artificial Ecosystem in Baise



Typical Natural Ecosystem in Hechi



Typical Natural Ecosystem in Hechi



Typical Artificial Ecosystem in Hechi

4.2 Socio-economic overview

4.2.1 Population and Distribution

The Project involves 10 Counties in Hechi and Baise Cities, covering 54 townships, 117 administrative villages (95 are prioritized for 13th FYP poverty reduction program) with a total population of 4.0124 million, among which 757000 are poor population, taking up 18.87% of the total population.

4.2.2 Minority Groups

In the 10 Project Counties, the population of minority groups is 3.4984 million, taking up 87.19% of the total population. Population of Han Chinese is 514000 , taking up 12.7% of the total population. The main minority groups are the Zhung and Yao Groups. The population of the Zhuang people is 2995600, taking up 74.66% of the total population, while the Yao has 457000 people, taking up 11.39% of the population. Other minority groups include Dong, Gelao, Shui and Maonan with a population of 45800, taking up 1.14% of the total population

4.2.3 Income Levels

In 2014, net income per capita of the rural population in the 10 Project Counties was 6020 yuan, 1545 yuan (or 20.42%) less than provincial level which was 7565 yuan . Household income comes mainly from household business and salary of (off-farm work), which takes up over 85% (average 91.9%).

4.3 Environmental and Social Background of Project Counties

4.3.1 An Overview of Du An County

4.3.1.1 Natural Conditions

Du An Yao Autonomic County is located in the center of Guangxi, on the slope area where the Yunnan-Guizhou Plateau is extending into the basin in Guangxi. Between Longitude 107 ° 29'-108 ° 41 ' , and latitude 23 ° 42'-24 ° 35' . Hong Shui River (the Red River) runs through the west and south part of the county. Its neighbor counties include Xincheng in the east, Mashan and Pingguo in the south, Bama and Donglan counties in the west and Yishan and Hechi in the North

Du An, which is 121 km from east to west and 99 km from north to south, covers a land area of 6468.5 square kilometers, takes up of 2.74% of Guangxi's total land area or 19.99% of Hechi's total land area.

As the slope area where Yunnan-Guizhou Plateau extends into the basin of Guangxi, the North and West parts of the county are higher than the South and East parts. The main water system, the Red River with its two branches (Cheng River and Diao River) , runs throughout the county from northwest to southeast. Rocky karst mountains which dominate the landscape, covers 5452.44 square kilometers or 84.29% of the total land area of the County. Therefore, it is also called a Kingdom of Karst Mountains. Other landscapes include hilly land area 561.14 square kilometers or 8.67% of the total land area and basin (or flat) land for 397.42 square kilometer or 6.14% of the total land area. The summit elevation which is in Bansheng-Qi Bai Nong Area, is 900-1100 meters, while the valley floor elevation is 600-800 meters. The lowest part which has a summit elevation of 400-600 meters, is the

valley in the downstream of the Red River in the south, while the valley floor elevation is 130-200 meters. The lowest valley is only 112 meters. The total topographic gradient is 8 %.

The surface water system in the County is not well developed. The river density is 0.0889 per square meter. There are nearly 100 rivers but most of them are seasonal streams. Only 17 of these streams have over 20 square kilometers of catchment area. The total catchment area is 3363.7 square kilometers. The total average annual flow is 131.9 cubic meters per second. The maximum total flow in the flood period is 4447.4 cubic meters per second, while in the dry season, the minimum total flow is 5.5 cubic meters per second. Rivers with over 50 square kilometers of catchment area, which means they are worth developing, include the Red River, Diao River, Chengjiang, Fulong River, Mianshan River, Banling River, Yema River and Tonggeng River. The normal flow of the Red River, Diao River and Cheng River is over 25 cubic meter per second.

Severe mountain desertification area is 1610.53 km², medium level 116.49 km² and light level 31.76 km². Details of degradation is in the following table 4.3-1.

Table 4.3-1 Mountain Degradation in Project Areas in Du An County

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Du An	Yongji Village Yongán Township	Degraded land	Severe degradation
		Liuli Village Chengjiang Township	Non-degradation land	No degradation
		Yuanli Village Bao An Township	Potential degradation land	No degradation
		Wudong Village Gaoling Township	Potential degradation land	No degradation
		Yijiang Village Gaoling Township	Degraded land	Mild degradation
		Jiacha Village Gaoling Township	Potential degradation land	No degradation
		Nongming Village Gaoling Township	Degraded land	Extremely severe degradation
		Fuxing Village Gaoling Township	Potential degradation land	Medium degradation
		Jiating Village Gaoling Township	Degraded land	Severe degradation
		Jiaquan Village Gaoling Township	Potential degradation land	Mild degradation

4.3.1.2 Social Profiles of Du An County

Du An has the largest Yao Ethnic Group in China. Aside from Yao, there are other 12 ethnic groups including Zhuang, Han, Miao, Mulao, Maonan and Shui. The total population is 702100, among which 167700 are poor people (23.89%) and 666500 (94.9%) are from minority groups. Net income per capita of rural residents in 2014 was 5089 Yuan.

4.3.2 An Overview of Dahua County

4.3.2.1 Natural Conditions

Dahua Yao Autonomous County is in the northwest part of Guangxi, covering the middle stream of the Red River. It is an area where the edges of Hechi Prefecture, Du An County, Bama County and Nanning Prefecture join, 130 kilometers from Nanning, the capital city of Guangxi, Dahua covers a land area of 2716 square kilometers. Its water ways come from Guizhou and run down to Guangzhou.

Dahua is located on the end part of Yun-Gui Plateau. Duyang mountains run throughout the County from north to south. The sea level of the north part is between 500-800 meters. The highest mountains are the Bansheng-Qi Bai Nong mountain areas whose sea level is between 900-1000 meters. The highest peak, Nong Er Mountain which is 1108-meter-high, is Qi Bai Nong Township. The sea level in the south is between 150-300 meters. The County is dominated by Karst mountains, erosion hills and valleys. Karst landscape covers the largest area. The typical karst landscape is mainly made up of peaks and valleys. The County has thousands of peaks and valleys. Qi Bai Nong Township itself has 1300 valleys and only 324 of them have inhabitants.

Total length of surface waterway is 474 kilometers. River density is 0.16 km/km². The main river is the Red River which runs through the County for 160 kilometers with 9 branches for 117.2 kilometers. It has been confirmed that there are 14 ground rivers with a total length of 1242 kilometers and the average flow is 0.89 m³/s

Severe mountain desertification area is 634.83 km², medium level 116.49 km² and mild level 31.76 km². Details of degradation is in the following table 4.3-2.

Table 4.3-2 Mountain Degradation in Project Areas in Dahua County

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Dahua	Renliang Village Dahua Township	Degraded land	Severe degradation
		Longma Village Dahua Township	Non-degradation land	No degradation
		Jiacheng Village Duyang Township	Non-degradation land	No degradation
		Jiasi Village Liuye Township	Degraded land	Medium degradation
		Longkou Village Dahua Township	Non-degradation land	No degradation
		Dunsu Village Dahua Township	Non-degradation land	Mild degradation
		Duyang Village Duyang Township	Degraded land	Medium degradation
		Zhongwu Village Duyang Township	Non-degradation land	No degradation
		Wucheng Village Duyang Township	Non-degradation land	No degradation
		Huashan Village Liuye Township	Non-degradation land	No degradation

4.3.2.2 Social Profiles

There are 11 ethnic groups including Zhuang, Han, Miao, Mulao, Maonan, Man, and Shui ethnic groups. The total population is 460500, among which 80800 are poor people (17.55%) and 434400 (94.33%) are from minority groups. Net income per capita of rural residents in 2014 was 5140 Yuan.

4.3.3 An Overview of Donglan County

4.3.3.1 Natural Conditions

Donglan is located in the northwest of Guangxi, between east longitude 107 ° 5'-107 ° 43 ' and latitude 24 ° 13'-24 ° 51'. Its neighbor counties include Hechi City in the east, Fengshan County in the west, Bama and Du An Counties in the South, and Tiané and Nandan Counties in the north. Donglan is 308 km from the regional capital of Nanning. The length from north to south is 68 km and the width from east to west is 65 kilometers. The total area is 2415 square kilometers.

Donglan is located in the southern edge of the Yunnan-Guizhou Plateau, northwestern part of Guangxi. Tilt from northwest to southeast, the north part of the County is higher than the south part. Rivers run from north to south into the Red River. The dominant landscapes include steep slopes, karst hills, karst valleys, peaks and valleys.

Rivers in the County belong to the Red River system. All run from northwest into the Red River except that Dongping River runs into Panyang River in Bama County. The Red River runs through and exits the County from Dayong in Datong Township. Aside from the Red River, there 250 rivers running through the County. Each of the nine rivers including Baying River, Banlong River, Pola River, Lanyang River, Jiuqu River, Banlao River, Pohao River, Sanjia River and Dongping River, covers a catchment area of over 40 km². Except for Baying River which originates from Fengshan County, all rivers originate from Donglan itself. The total length of all rivers is 340.7 kilometers (not including the Red River) and the total catchment area is 2415 km². The average annual runoff is 1.607 billion cubic meters. The maximum flow is 1232.6 cubic meters per second and the flow rate is 0.5767 cubic meters per second in the dry season. Geographical distribution of rivers is uneven. There are more rivers in the soil hilly areas while there are no surface rivers in the rocky mountainous areas. Rivers are deep and are recharged by rain. There is large difference in river flow in wet and dry seasons due to the monsoon climate and the topography and the density of vegetation. The change of flow before and after rainfalls impacts irrigation.

Severe mountain desertification area is 177.33km², medium level 542.54 km² and mild level 185.71 km². Details of degradation is in the following table 4.3-3.

Table 4.3-3 Mountain Degradation in Project Areas in Donglan County

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Donglan	Jiangdong Village Donglan Township	Non-degradation land	No degradation
		Banlie Village QieXue Township	Non-degradation land	No degradation
		Banlong Village Changjiang Township	Degraded land	Mild degradation
		Antao Village Bashou Township	Non-degradation land	No degradation
		Weirong Village Donglan Township	Non-degradation land	No degradation
		Banlao Village Aidong Township	Non-degradation land	No degradation
		Liutong Village Aidong Township	Non-degradation land	No degradation
		Qixue Village Qixue Township	Degraded land	Medium degradation
		Gengle Village Changle Township	Potential degradation land	Mild degradation
		Renhe Village Sanshi Township	Degraded land	Medium degradation
		Dongli Village Wuzhuan Township	Non-degradation land	No degradation

4.3.3.2 Social Profiles

There are 8 ethnic groups including Zhuang, Han and Yao ethnic groups. Zhuang is the majority, followed by Han and Yao. The total population is 307900, among which 95300 are poor people (30.95%) and 282300 (991.1%) are from minority groups. Net income per capita of rural residents in 2014 was 4790Yuan.

4.3.4 An Overview of Bama County

4.3.4.1 Natural Conditions

Known as the world's longevity, Chinese Holy Land, Bama Yao Autonomous County is in the Northwestern of Guangxi and is a part of Hechi City, .between the east longitude 106 ° 51'-107 ° 23 ' , and latitude 23 ° 51'-24 ° 23' . Its neighbor counties include Baise, Tianyang, Tiandong, Pingguo, Dahua, Donglan, Fengshan and Lingyun Counties. The County covers a total land area of 1971 km².

Bama is located on the hilly area where Yunnan-Guizhou Plateau extends into the flat land in the center of Guangxi. Its western part is higher than its eastern part. The sea level is between 500-800 meters. Rocky (karst) mountains take up 30%, soil hills take up 69% and waters take up 1% of the land area.As the land is dominated by thousands of hills, Bama is called ten thousand hills. In the west there are more high karst mountains, while in the other parts there are more slopes. Hills, karst mountains and valleys are the main landscapes.

All rivers in Bama belong to the Pearl River system. The Red River runs on the border between Bama and Du An and is the border between two counties. Other large rivers include Panyang River which originates in Qiaoyin Fengshan County, Lingqu River which originates in the mountains in the west part of the County and Baidong River and Ceba River which run in the mountains and join in Youjiang River in Tianyang County. The total surface water runoff is 1.1 billion cubic meters.

Severe mountain desertification area is 337.48 km², medium level 120.34 km² and mild level 29.25 km². Details of degradation is in the following table 4.3-4.

Table 4.3-4 Mountain Degradation in Project Areas in Bama County

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Bama	Dena Village Fenghuang Township	Potential degradation land	Mild degradation
		Changhe Village Fenghuang Township	Degraded land	Medium degradation
		Bana Village Xishan Township	Potential degradation land	Mild degradation
		Hele Village Xishan Township	Potential degradation land	Mild degradation
		Poteng Village Bama Township	Non-degradation land	No degradation
		Banyang Village Bama Township	Non-degradation land	No degradation
		Donglie Village Nashe Township	Non-degradation land	No degradation
		Yanting Village Yandong Township	Non-degradation land	No degradation
		Pingliu Village Suolue Township	Non-degradation land	No degradation
		Langyin Village	Non-degradation land	No degradation

	Suolue Township	
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4.3.4.2 Social Profiles

There are 13 ethnic groups including Yao, Zhuang, Han and Maonan ethnic groups. The total population is 292100, among which 60100 are poor people (20.58%) and 228700 (78.30%) are from minority groups. Net income per capita of rural residents in 2014 was 4819 Yuan.

4.3.5 An Overview of Fengshan County

4.3.5.1 Natural Conditions

Fengshan County is on the south edge of the Yunnan-Guizhou Plateau in the Northwest of Guangxi and is a part of Hechi City. The western point of the County is the east longitude 106°40'50" and latitude 24°36'10", the eastern point 107°16'57 and 24°32'15", the southern point 106°55'20" and 24°15'30" and its northern point 107°1'34" and 24°49'34", covering 60.9 km from east to west and 63.9 km from north to south. The County Town is located in the center of County. The total land area is 1738 km², dominated by karst mountains with small arable land area.

Panyang River, Baying River and Poxin River are the three major rivers running through the central, eastern and southern parts of the County. The total length of the three rivers is 116.3 kilometers. Their branches include 129 rivers and streams with a total length of 767.81 kilometers. The river net density is 0.44 km/km². The catchment area is 1737.97 km². The total annual flow is 1.19 billion m³.

Severe mountain desertification area is 155.22 km², medium level 312.24 km² and mild level 127.83 km². Details of degradation is in the following table 4.3-5.

Table 4.3-5 Mountain Degradation in Project Areas in Fengshan County

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Fengshan	Changzhou Village Changzhou Township	Non-degradation land	No degradation
		Nale Village Changzhou Township	Non-degradation land	No degradation
		Na Ai Village Changzhou Township	Non-degradation land	No degradation
		Banren Village Changzhou Township	Non-degradation land	No degradation
		Banlun Village Changzhou Township	Non-degradation land	No degradation
		Langli Village Changzhou Township	Non-degradation land	No degradation
		Nalao Village Changzhou Township	Non-degradation land	No degradation
		Heyun Village Qiaoyin Township	Non-degradation land	No degradation

	Nawang Village Qiaoyin Township	Non-degradation land	No degradation
	Shanglin Village Qiaoyin Township	Non-degradation land	No degradation
	Tongle Village Qiaoyin Township	Non-degradation land	No degradation
	Wenli Village Qiaoyin Township	Non-degradation land	No degradation
	Pocha Village Jinya Township	Degraded land	Medium degradation
	Gengsha Village Jinya Township	Degraded land	Medium degradation
	Longwang Village Jinya Township	Degraded land	Medium degradation

4.3.5.2 Social Profiles

There are Zhuang and Han ethnic groups. The total population is 215400, among which 59400 are poor people (27.58%) and 138100 (64.11%) are from minority groups. Net income per capita of rural residents in 2014 was 4715Yuan.

4.3.6 An Overview of Yizhou County

4.3.6.1 Natural Conditions

Yizhou City (county-level) is in the North Central part of Guangxi and is a part of Hechi City. The western point of the City is on the east longitude 106°40'50" and latitude 24°36'10", the eastern point 107°16'57" and 24°32'15", the southern point 106°55'20" and 24°15'30" and its northern point 107°1'34" and 24°49'34", covering 60.9 km from east to west and 63.9 km from north to south. The County Town is located in the center of City. The total land area is 1738 km², dominated by karst mountains with small arable land area. Its neighbor counties include Liucheng and Liujiang in the east, Xincheng and Du An in the south, Hechi in the west and Huanjiang and Luocheng in the north.

Located between east longitude 108 ° 4'11 " ~ 109 ° 2'44" north latitude and 24 ° 0'10 " ~ 24 ° 52'5" and with Longjiang River, Guizhou-Guangxi Railway and national road 323 running through, Yizhou is the hub connecting Northwest and Southeast of Guangxi, as well as Guizhou and Human Provinces. The total land area is 3869 km². Karst slopes, hills and valleys are the dominant landscapes. °

The rivers running through Yizhou belong the Xijiang River system of the Pearl River Basin. Longjiang is the major river which has two branches: Linjiang River (or Jianhe) and Zhongzhou River (or Xiao Huanjiang). Yizhou has totally 295 rivers and streams, among which 211 are seasonal rivers. Duliang River runs into Diaojiang River and Yongding River runs into the Red River. All others are branches of Longjiang. Linjiang and Zhongzhou are two major branches, each of which has a catchment area of over 1000 km². Luoshou River, Wugong River, Yongdai River and Da An River each covers a catchment area of 100-1000 km², and Deqiao River, Siliu River and Zhonghe River each covers a catchment area of 50-100 km². The total river basin area is 16216 km², among which 3420.3 km² is within Yizhou. The average annual flow is 393.8 m³/second. Annual runoff is 12.45 billion cubic meters. Runoff happens in April-September, taking up 77.5% of the annual runoff. Some rivers flood in the flood season, but dry up in the dry season. The maximum flow is 10,755 cubic meters per second, nearly 293 times of the low flow which is 36.68 cubic meters per second. The total annual runoff of the City is 2.425 billion cubic meters.

Severe mountain desertification area is 338.09 km², medium level 371.06 km² and mild level 89.97 km². Details of degradation is in the following table 4.3-6.

Table 4.3-6 Mountain Degradation in Project Areas in Yizhou City

City	County	Village	Degradation Land Type	Status quo of Degradation
Hechi	Yizhou	Yantian Village Liu San Jie Township	Potential Degradation Land	No degradation
		Gudong Village Liu San Jie Township	Potential Degradation Land	No degradation
		Guwen Village Xiangbei Township	Non-degradation land	No degradation
		Latuo Village Xiangbei Township	Non-degradation land	No degradation
		Baitun Village Anma Township	Degraded land	Severe degradation
		Xiao Ai Village Anma Township	Degraded land	Severe degradation
		Latan Village Anma Township	Non-degradation land	No degradation
		Kenba Village Anma Township	Non-degradation land	No degradation
		Guyu Village Anma Township	Non-degradation land	No degradation
		Baiwei Village Xiangbei Township	Potential Degradation Land	No degradation
		Gudong Village Liu San Jie Township	Potential Degradation Land	No degradation
		Yantian Village Liu San Jie Township	Potential Degradation Land	No degradation
		Baitun Village Anma Township	Degraded land	Severe degradation
		Guwen Village Xiangbei Townshi	Non-degradation land	No degradation
		Latuo Village Xiangbei Townshi	Non-degradation land	No degradation
		Yantian Village Liu San Jie Township	Potential Degradation Land	No degradation

4.3.6.2 Social Profiles

There are Zhuang, Han, Yao, Miao, Mulao, Maonan, Dong and Hui ethnic groups in Yizhou. The total population is 655000, among which 71800 are poor people (10.96%) and 589000 (83.6%) are from minority groups. Net income per capita of rural residents in 2014 was 7630Yuan.

4.3.7 An Overview of Tiandong County

4.3.7.1 Natural Conditions

Tiandong County is located in the west central part of Guangxi, covering from north latitude 23 °

16 'to 24 ° 01' and longitude 106 ° 53 'to 107 ° 26. Its neighbor counties include Pingguo in the east, Debao and Tiandong in the south, Tianyang in the west and Bama in the north. The easternmost villages are Jinhua in Daowu Township. The southernmost village is Danuo in Jiangcheng Township. The westernmost village is Tuoxian in Bubing Township and the northernmost village is Shimu in Yixu Township. The total land area is 2816 km²

In topography, Tiandong is a basin with mountains in south and north parts and Youjiang River running through the center of the basin. South to the basin are low rocky and soil hills. North to the basin are soil hills and mountains with higher sea level. Among hills and mountains are valleys, rivers, or streams or small basins.

Rivers in Tiandong belong to the Xijiang water system of the Pearl River Basin. Youjiang, Xiangshui, Longxu, Gurong and Lingzhi are the major rivers. Longxu, Gurong and Xiangshui are branches of Youjiang River, while Lingzhi is a branch of the Red River. The total river basin area is 2816 km². The total length is 277 kilometers. The river density is 0.098 km/km². Average annual flow is 371 m³/second. Natural drop is 583.8 meters. These five rivers have only 34 branches (each covers a catchment area of over 10 km²) which cover a total length of 368.05 kilometers.

Severe mountain desertification area is 266.32 km², medium level 3.13 km² and mild level 0.04 km². Degradation in Tiandong is medium, Details of degradation is in the following table 4.3-7.

Table 4.3-7 Mountain Degradation in Project Areas in Tiandong County

City	County	Village	Degradation Land Type	Status quo of Degradation
Baise	Tiandong	Lianhe Village Xiangzhou Township	Non-degradation land	No degradation
		Dingyang Village Xiangzhou Township	Non-degradation land	No degradation
		Daban Village Zuodeng Township	Non-degradation land	No degradation
		Xin An Village Zuodeng Township	Non-degradation land	No degradation
		Fuxing Village Naba Township	Non-degradation land	No degradation
		Minzu Village Liinfeng Townshi	Non-degradation land	No degradation
		Liangyu Village Silin Township	Non-degradation land	No degradation
		NabanVillageYinc ha Township	Non-degradation land	No degradation
		LixinVillageYinch Township	Degraded land	Extreme degradation
		Liuzhou Village Naba Township	Non-degradation land	No degradation

4.3.7.2 Social Profiles

There are 8 ethnic groups including Zhuang, Han, Yao, Miao, Hui, Meng, Man, and Shui ethnic groups. The total population is 433500, among which 52100 are poor people (12.02%) and 393600 (90.80%) are from minority groups. Net income per capita of rural residents in 2014 was 8357 Yuan.

4.3.8 An Overview of Pingguo County

4.3.8.1 Natural Conditions

Pingguo County is located in the west central part of Guangxi, ie. East part of Baise City. Its geographic coordinates are Longitude 107°21'~107°51' and North latitude 23°12'~23°51'. Matou Township is the central point of the Baise-Nanning Highway, which is 136 km from the Nanning, the Capital City of Guangxi, and 129 km from Baise City. The middle stream of Youjiang River runs through four townships. The total land area is 2485 km².

The topography is that the middle part of the County is higher than the north and south parts., ie. inclined from the northwest to the east. Youjiang River runs through the southwest part and the sea level of the river banks is 110 meters. Some branches of the Red River run through the north part and their elevation is 200-230 meters. The middle part of the County which is 280-450 meters above sea level, is dominated by karst mountains. The highest point which is 934.6-meter-high, is the peak of Guitou Mountain in Haicheng Township. The lowest part which is 106 meters above sea level which is in Chengguan Township. Two river systems run through Pingguo County: the Red River and Youjiang River systems. The total length of rivers is 456.2 kilometers. The river density is 0.18 km/km². Liming River, Dahong River, and Dasai River run through the northeast part of the County and join into one: the Pingzhi River with a catchment area of 2029.6 km² in Keshang Renshi village Fengwu Township. In the southeast part there are Laijiang, Longma, Xinxu, Dagan and Dale rivers which run into Youjiang. The catchment area of these rivers is 1199 km². There are 26 streams among which 9 are useful. The total annual runoff is 1.42 86 billion cubic meters. There is a large difference in the flow in wet and dry seasons, except for Youjiang River, due to climate, vegetation and other reasons.

Severe mountain desertification area is 801.44 km², medium level 29.6 km² and mild level 2.64 km². Details of degradation is in the following table 4.3-8.

Table 4.3-8 Mountain Degradation in Project Areas in Pingguo County

City	County	Village	Degradation Land Type	Status quo of Degradation
Baise	Pingguo	Ponan Village Xin An Township	Degraded land	Medium degradation
		Balong Village Guohua Township	Potential degradation land	Mild degradation
		Chami Village Taiping Township	Potential degradation land	No degradation
		Yangiang Village Taiping Township	Degraded land	Severe degradation
		Jilin Village Taiping Township	Degraded land	Severe degradation
		Xinmin Village Haicheng Township	Degraded land	Severe degradation
		Dingdi Village Haicheng Township	Degraded land	Severe degradation
		Gaole Village Haicheng Township	Degraded land	Medium degradation
		Liu An Village Jiucheng Township	Non-degradation land	No degradation

	Linlin Village Taiping Township	Potential degradation land	No degradation
	Chami Village Taiping Township	Potential degradation land	No degradation
	Longban Village Pozao Township	Non-degradation land	No degradation
	Xingeng Village Jiucheng Township	Degraded land	Medium degradation
	Yongqi Village Haicheng Township	Degraded land	Severe degradation
	Longpai Village Fengwu Township	Degraded land	Medium degradation
	Yongwang Village Bangxu Township	Degraded land	Severe degradation

4.3.8.2 Social Profiles

There are Zhuang, Han, Yao, Miao, Tujia and Maonan ethnic groups. The total population is 512100, among which 51700 are poor people (10.10%) and 483300 (94.38%) are from minority groups. Net income per capita of rural residents I 2014 was 6963Yuan.

4.3.9 An Overview of Tianlin County

4.3.9.1 Natural Conditions

Tianlin County is in the northwest part of Guangxi, longitude 105.27°~106.15° and north latitude 23.58°~24.41°, north of the Tropic of Cancer. Its neighbor counties include Baise, Lingyun and Leye counties (city) in the east, Funing County of Yunnan Province in the south, Xilin and Longlin counties in the west and Ceheng County of Guizhou Province on the other side of Nanpan River. Tianlin is the largest county in Guangxi. The County Town Leli is 270 km from Nanning. The total land area of Tianlin is 5577 km².

Tianlin is on the transition area, the edge of the Yunnan-Guizhou Plateau. Qinglong, Jinzhong, Liushao Mountains stand in northeast, northwest and the south parts. The County is dominated by mountains, karst and soil mountains. Langping, Pingshan, Longche, Pingtang and Gaolong Townships are dominated by karst mountains, covering 28873.33 Ha. (5.2% of the total area of the county). Most of the karst mountains are over 800 meters above sea level. The highest peak is 1900 meters high and the relative height is 500-900 meters. Among thousands of peaks are valleys and caves. Soil mountains are found all over the County, covering 528826.67 Ha., 94.8% of the total land area. Mountains are high and among mountains are deep valleys. The relative height is between 200 and 1000 meters. Three types of mountains, medium, low and high mountains make the main landscapes.

The Youjiang River system and the Nanpan River system are the main water systems. Youjiang River system comprises Tuoniang River, Leli River and Bagui River, covering 4506.5 km² basin area, or 80.81% of the total land area. While Nanpan River system which includes Banjian River, Jiuzhou River and Baile River which cover 882.8km² or 15.83% of the total land area. The other small rivers make up 184 kilometers and 187.7 km², taking up 3.30% of the total land area. Years' average flow is 0.20 m³/second. Average runoff is 197.1 million cubic meters and the drop that can be useful is 950 meters.

Severe mountain desertification area is 77.24 km², medium level 26.36 km² and mild level 3.46 km². Details of degradation is in the following table 4.3-9.

Table 4.3-9 Mountain Degradation in Project Areas in Tianlin County

City	County	Village	Degradation Land Type	Status quo of Degradation
Baise	Tianlin	Yinbiao Village Baile Township	Non-degradation land	No degradation
		Bangan Village Baile Township	Non-degradation land	No degradation
		Boé Village Badu Township	Non-degradation land	No degradation
		Zhetang Village Badu Township	Non-degradation land	No degradation
		Nongguang Village Lucheng Township	Non-degradation land	No degradation
		Sanyao Village Lucheng Township	Non-degradation land	No degradation
		Wenhua Village Leli Township	Non-degradation land	No degradation
		Baxin Village Anding Township	Non-degradation land	No degradation
		Zhenian Village Jiuzhou Township	Non-degradation land	No degradation
		Pinglin Village Jiuzhou Township	Non-degradation land	No degradation
		Guanglong Village Jiuzhou Township	Non-degradation land	No degradation
		Genbiao Village Baile Township	Non-degradation land	No degradation
		Bangan Village Baile Township	Non-degradation land	No degradation
		Boé Village Badu Township	Non-degradation land	No degradation
		Zhetang Genbiao Village Baile Township	Non-degradation land	No degradation
		Nongguang Village Lucheng Township	Non-degradation land	No degradation
		Sanyao Village Lucheng Township	Non-degradation land	No degradation
		Bazhong Village Zhemiao Township	Non-degradation land	No degradation
		Baheng Village Zhemiao Township	Non-degradation land	No degradation
		Pinggu Village Lizhou Township	Non-degradation land	No degradation
		Wenhua Village Leli Township	Non-degradation land	No degradation
		Balai Village Anding Township	Non-degradation land	No degradation
		Changjing Village Anding Township	Non-degradation land	No degradation
		Baxin Village Anding Township	Non-degradation land	No degradation
		Zhenian Village Jiuzhou Township	Non-degradation land	No degradation
		Pinglin Village	Non-degradation land	No degradation

		Jiuzhou Township		
		Guanglong Village Jiuzhou Township	Non-degradation land	No degradation

4.3.9.2 Social Profiles

There are Zhuang, Han, Yao, Miao and Hui ethnic groups. The total population is 260000, among which 68600 are poor people (26.38%) and 192700 (74.12%) are from minority groups. Net income per capita of rural residents in 2014 was 5648 Yuan.

4.3.10 An Overview of Leye County

4.3.10.1 Natural Conditions

Leye County is located in the Northwest part of Guangxi or the southeast part of the Yunnan-Guizhou Plateau, covering from longitude 106°10' to 106°51' and latitude 24°30' to 25°03' . Nanpan River and Beipan River join in the north and become the Red River. The neighbor counties include Tiané and Fengshan in the east, Lingyun County in the south, Tianlin County in southeast, Ceheng County of Guizhou Province on the other side of Nanpan in the west and Wangmo and Luodian Counties of Guizhou Province on the other side of the Red River in the north. The County Town Tongle is 460 kilometers from Nanning. The total land area is 2617 km².

The dominant landscape is karst mountains, peaks and valleys.

Nanpan River and the Red River are the two main rivers. Nanpanjiang (Nanpan River) originates in Qujing in Yunnan Province. Running from west to east, it goes through Xilin County and then become the border between Guangxi and Guizhou Provinces. On the left side of river are Xingyi, Anlong, Ceheng and Mowang Counties of Guizhou Province and on the other side are Xilin, Longlin, Tianlin and Leye Counties of Guangxi. It runs from Badong Village in Tianlin County into Leye County and becomes the border between Leye and Wangmo Counties. In Weigou, Yachang Township in the north of the County, the River joins in Beipanjiang (Beipan River) and from here the joint river is called the Red River which continues running north, through Tiané, Nandan, Donglan, Bama, Duán, Xincheng and Laibin Counties. In Sanjiangkou, Shilong Township in Xiangzhou County, it is met with Liujiang River and from here it is called Qianjiang. Nanpanjiang runs 23 km through Leye County. The width reaches 120 meters. The entry height is 315 meters. The height at joint point is 301 meters. The drop of the River is 14 meters. The total length of the Red River which star

ts in Leye and runs down to where it meets Liujiang, is 659 km long, with 138000 km² catchment area, The Red River in Leye is 51 kilometers long and the width is 150 meters. The drop is 31 meters and the slope is 0.61‰. Although both Rivers are deep, there not conditions for irrigation or to generate power, it can be used for seasonal navigation.

Severe mountain desertification area is 151.56 km², medium level 142.69 km² and mild level 19.93 km². Details of degradation is in the following table 4.3-10.

Table 4.3-10 Mountain Degradation in Project Areas in Leye County

City	County	Village	Degradation Land Type	Status quo of Degradation
Baise	Leye	Dacun Village Tongle Township	Non-degradation land	No degradation
		Liuwei Village Tongle Township	Non-degradation land	No degradation
		Dadao Village Gantian Township	Degraded land	Severe degradation

	Banhong Village Gantian Township	Non-degradation land	No degradation
	Huaping Village Huaping Township	Potential degradation land	No degradation
	Bamu Village Huaping Township	Degraded land	Severe degradation
	Tangying Village Luosha Township	Non-degradation land	No degradation
	Leweng Village Xinhua Township	Non-degradation land	No degradation
	Linli Village Xinhua Township	Non-degradation land	No degradation
	Nawei Village Xinhua Township	Non-degradation land	No degradation

4.3.10.2 Social Profiles

There are Zhuang, Han, Yao, Miao, Yi, Mulao and Hui ethnic groups. The total population is 173900, among which 49500 are poor people (28.5%) and 89800 (51.6%) are from minority groups. Net income per capita of rural residents in 2014 was 4926 Yuan.

石灰岩地区石漠化程度分布图 Rocky Desertification Degree Distribution of Limestone Region

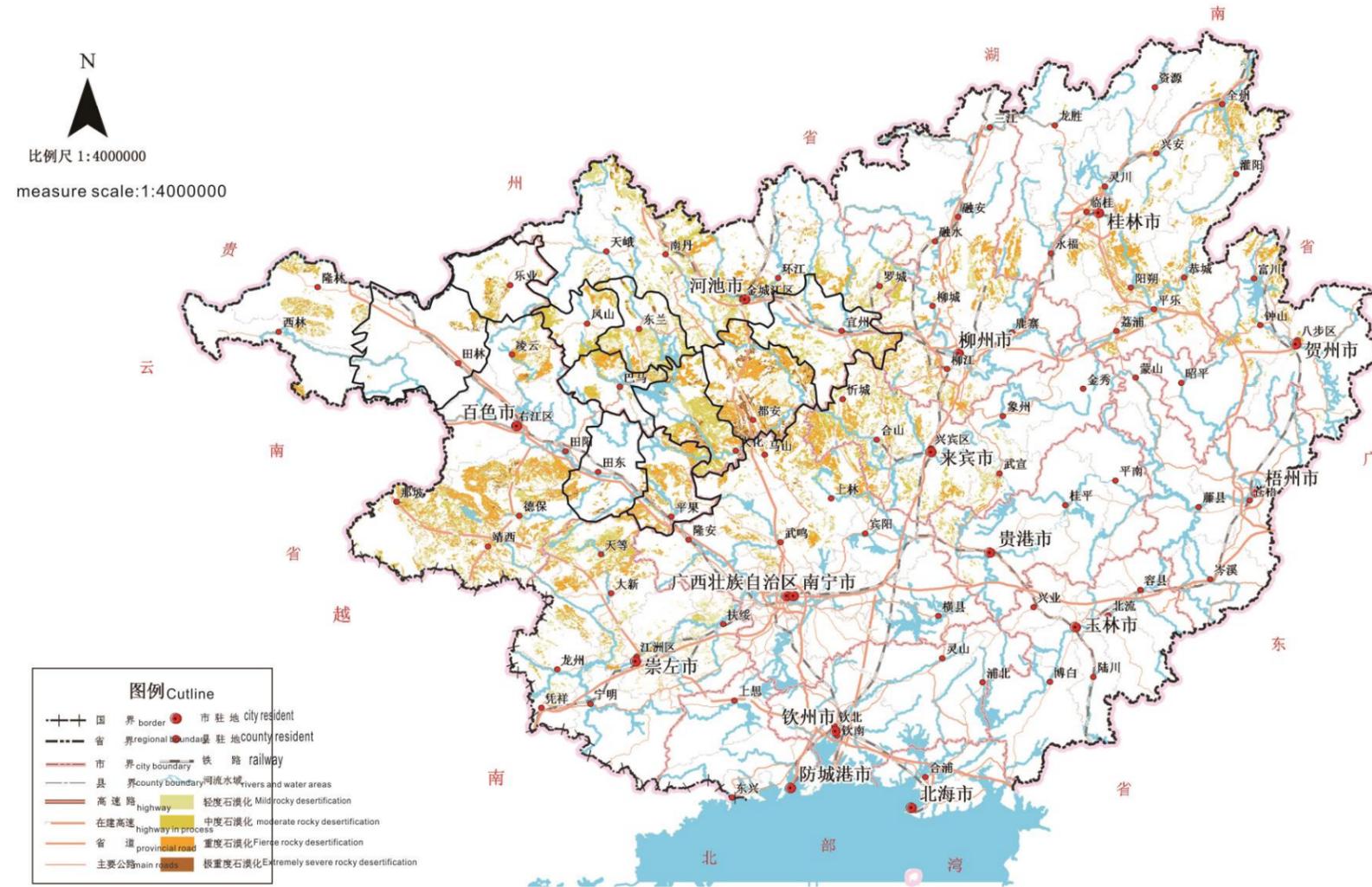


Figure 6 Status Quo of Degradation in Project Area

4.4 Key Environmental and Ecological Issues

4.4.1 Regional environmental quality

To learn about the status of the quality of the environment, we took the conclusion of the Environment Quality Bulletin 2015 as reference. The Project areas are not in urban established areas and the environmental quality is better as there is no industrial pollution source.

In 2015, the environmental monitoring station of Hechi City carried out ambient air quality monitoring. Three monitoring points were established and equipped with monitoring systems which monitor 24 hours automatically. Monitored items include SO₂, NO₂, PM₁₀, CO, O₃ and PM_{2.5}. The results show that in 2015 the annual average concentration of the sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and respirable particulate matter (PM₁₀) reached the secondary standard of the "Ambient Air Quality Standard" (GB3095-2012); 24-hour average concentration of nitric oxide (CO) and the daily maximum 8 hours mean concentration of ozone (O₃) reached the secondary standard of the "ambient air quality standard" (GB3095-2012); the annual average concentration of fine particulate matter (PM_{2.5}) exceed the secondary standard of the " ambient air quality standard "(GB3095-2012).

Monitoring was undertaken on surface water quality by the seven sections of the four major rivers in Hechi City and special monitoring was carried out for heavy metals in surface water. The results show that in 2015 the average quality of seven sections of the monitored surface water meets or exceed III standards of the "Surface Water Environmental Quality Standard" (GB3838-2002). Among them, the compliance rate of the quality of the sections of the Red River in Liupai and Dahua, the quality of the sections of Longjiang in Liujia, Sanjiangkou and Yangmin and the quality of the section of Diaojiang is 100%; and that of Dongjiang Da Huanjiang is 91.7%.

Air Composite Index (AQI) of Baise City in 2015 was at a good level. The number of the good days reaches 323 days. The annual average density of PM₁₀ is 67 micrograms / cubic meter, better than the secondary standard which is 70 micrograms / cubic meter, of the "Ambient Air Quality Standard", decreased by 9.5% compared with 2014. The compliance rate of water quality control at national, provincial and city levels for 14 rivers, lakes and reservoirs in Base City is 100%. The compliance rate of two centralized domestic water sources at city level and 12 at county level is 100%.

4.4.2 Main characteristics of the Karst Landscape and Mountain Desertification

4.4.2.1 Main characteristics of the Karst Landscape

Karst landscape is the dominant landscape in Hechi and Baise. Karst mountains are steep with a thin layer of soil on the surface, which is easily eroded. The main physical basis of the Karst mountains is carbonate. Underground is a large number of caves due to erosion by groundwater. Although there is plenty of rainfall and rich groundwater, surface water is hardly conserved due to the large number of holes. Drought and floods occur frequently, which has impact on the livelihood of the local community.

4.4.2.2 Causes of Karst Mountain Desertification

Degradation is caused by natural processes and human factors. Unsustainable development of Humans is the major cause.

The two Project Cities, Baise and Hechi, are located in the subtropical monsoon climate with abundant rainfall . When it rains heavily and continuously for several days, the land which has lost forest cover, loses protection and severe soil erosion happens, and sometimes landslides happen,

leading to desertification. In addition, soil forming in the karst areas is very slow, only 10.4—26t/km² under good humidity and heat. It normally takes 600 to 1,500 years to dissolve a 30-centimeter-thick rock and accumulate 1cm of soil parent material. Soil loss due to lack of vegetation cover has greatly exceeded the speed of soil forming, 6.5 to 17 times. Irreversible soil negative growth is one of the causes of rocky desertification.

On the other hand, there is a large population in Project Area. In the past, the conflict between resource and fuel need gets more intensive. The people in these karst areas rely heavily on the resource for food and fuel, ie. deforestation for land reclamation, excessive firewood collection, excessive grazing and mining all of which ruin the vegetation and cause soil erosion. The mountains lose the protection from vegetation and eventually become bare rocky mountains. This is the typical mountain degradation in the karst areas.

The current status of rock desertification in the project area is shown in Figure 6.

4.4.2.3 Main measures for desertification control

Official statistics for 2005 indicates that the desertification area in Guangxi was 2.38 million ha. (29% of the karst area). Desertification in Hechi and Baise is the most severe. Largely, desertification is the main cause for poverty in the area. Guangxi has made large efforts for desertification management, which has actually been combined with poverty alleviation. Mountain Closure, Afforestation, Biogas Tanks (to reduce fuel wood collection) and land conversion for afforestation. All measures have good results. The latest survey shows desertification area in Guangxi has reduced by 45 thousand ha (19% of desertification area). Compared with year 2005.

(1) Artificial afforestation and mountain closure

Starting from late 1980's, Guangxi commenced a programme including Mountain Closure, Afforestation and Fuel Efficient Actions. At the same time, artificial afforestation was encouraged and trees (bamboo, Rendou and Xiangchun) were replanted among rocks. Vegetation cover in some karst mountains increases and fuel wood is addressed through continuous mountain closure and afforestation efforts, which has been helpful for income generation and poverty reduction.

(2) Rural Ecological EnergyProgram

In 1997, the government of Guangxi held a field workshop in Gongcheng County to promote the Livestock-Biogas-Plantation model. Since then, Guangxi's rural energy development entered a rapid development period. In 1998, the Government of Guangxi started a Rural Energy Development Project covering 100 villages, 50 townships and 20 counties. In 2001, another biogas tank program which was funded by the Ministry of Agriculture was commenced in Guangxi. This program focused on biogas tanks and supported upgrading of kitchens, toilets, livestock stalls, water supply, roads and housing. It was expected to accelerate rural energy development and reduce the use of forest resource, as well as improvement of rural living conditions through such programs.

(3) Soil and Water Conservation Projects

Soil and water conservation projects were commenced, including farmland protection activities and small catchment management pilot activities, water and soil conservation pilot projects (supported by Central level) in the South and North Panjiang Catchment, the upper streams of the Pearl River (Zhujiang), All of these efforts have greatly improved the erosion and degradation management and management methods and experience.

(4) Resettlement Projects

Since 1993, the Government of Guangxi has been implemented resettlement in minority groups.

Those who have harsh natural environment, arable land area per capita less than 0.02 hm² and problems in food and clothing, are relocated. The resettlement program enables targeted groups to start a new life with better conditions. In one way, it is great support to social and economic development in Guangxi.

(5) Rain Collection Tanks (Water Tanks)

In the karst mountain areas, water supply is always a big problem. In 1997, a domestic water project was commenced and with water tanks established, 1.5 million rural residents' problem in domestic water was addressed. Building on this project experience, in 1998, a rain collection tank for irrigation activity was implemented. Villagers were supported to set up water tanks at home and in the field to improve irrigation.

(6) Soil Improving Project

Since 1984, Guangxi has been regularly monitoring the soil fertility through 43 monitoring points distributed all over the Province and providing accurate data to improve the quality of farmland. At the same time, new fertilizer development centers and soil experimental bases were established at both provincial and prefecture levels to improve soil fertility and prevent soil from degradation.

(7) Cultivated Land Improvement Project

In responding to the new Land Management Law, Guangxi started a cultivated land improvement project to improve soil, irrigation, roads, woods and shelter belts in all over Guangxi including the karst areas. As a result, farming facilities and the ecological environment are largely improved to enable productivity to be largely increased.

(8) Animal Husbandry and Pasture Pilot Project

Since 1998, pasture development and protection has been integrated into animal husbandry development and viewed as an important approach to improve animal husbandry. 1. Development of pasture increases pasture supply so it is possible to increase the number of livestock without increasing pressure on natural pasture; 2. it is possible to implement stall feeding, changing the traditional livestock feeding into a more sustainable model; 3. Improving studies and demonstration on pasture development in degraded karst areas.

(9) The Green for Grain Project (Land Conversion)

The Green for Grain Project was piloted in Donglan and Leye Counties in 2001. In 2002, the Project was fully commenced all over the Province and achievement was notable. Most activities of the Project were implemented in the degraded karst areas. Through the Project, slope vegetation is restored, erosion is mitigated and farmers' income improves. The Project plays an important role in restructuring rural industries.

(10) Desertification Management Pilot Project

In 2001, Guangxi commenced a Desertification Pilot Project in 13 Counties which were prioritized for national poverty alleviation, including Pingguo County. The Project was successfully implemented and provides demonstration for degradation management.

(11) Forest Ecological Compensation Project

In 2001, the government started pilot sites for forest ecological compensation. In 2004, the forest ecological compensation system was implemented and Guangxi was given compensation for public forest and the scale was the same as pilot sites. Implementation of the public forest compensation system largely increases forest managers' enthusiasm and protection awareness. It is very helpful in

enhancing vegetation protection and development and plays an important role in holding back the trend of degradation.

Some of the villages involved in this Project are located in the degraded karst areas. They have limited water resource and arable land area, which is the main cause for their poverty. Through discussion with villagers, it is accepted the main approaches for management are: afforestation, mountain closure, ecological energy activities, water tanks, improving soil fertility, the Green for Grain Project (land conversion) and forest ecological compensation project. The proposed Project will support agricultural production. The crop species (walnut, dragon fruit) selected are suitable for local conditions.

4.4.3 Other Environmental Issues

Project areas are in poor karst areas which are far away from established urban areas. There is no industrial pollution and the ecological environment is good. Due to poor infrastructure in the rural areas, domestic water is not treated and solid waste is processed in the small incinerators. Compared with randomly thrown everywhere, incineration is a much more acceptable approach but it produces air pollution issue.

Villages which proposed tourism will face a large amount of waste and polluted water when the number of tourists increases dramatically. How to address such problems and make sure tourists have good feelings and experience must be taken into consideration by tourism proposers. For example, the buried micro biological wastewater treatment facilities or make use of the waste disposing systems in the near county town or township to increase disposability should be considered. Crop management in Project villages is still extensive management. Apply of fertilizer is not standard and directed. Livestock or poultry is extensive. Stall sanitation is not well managed and animal waste exposes in the open air. Only some biogas tanks use animal waste to produce biogas. Surface water and sanitation are impacted due to uncontrolled waste water. When the proposed Project is commenced, establishment of cooperatives will increase the number of livestock, which means animal waste will increase. Therefore, waste management and environmental capability need to be increased.

There are still no standard design and development for tourism such as homestay or guesthouse. No analysis has been done on the environmental capability. Tourism proposals need to work out protection measures and avoid impact on the environment by good estimate of tourist flow, and avoid too much influence from human activities.

5 Environmental and Social Impact and Mitigating Measures

5.1 Summary

The design of the Project adopts a form of a Framework. Sub projects are not specifically designed in the preparation period. Their locations will be selected by screening after the Project is commenced. According to the PDO and the components of the Project, it is confirmed that environmental impact will mainly created by CDF sub projects under Component 1 and rural infrastructure activities under Component 2.

The CDF under Component 1 will support the weakness in agricultural production (e.g breeding, processing and marketing) to enhance the establishment and development of cooperatives. Crops and livestock or poultry to be involved include Gragon Fruit, Mulberry, Mango, Bamboo, Camellia Oil, Kiwi Fruit, Tea, Walnut, Mulberry and Silkcoon, Wild Grape, Orange and Madarin, Mushroom, Sanwu Chicken, Yao Hometown Chicken, Bama Frangrant Pig and Goat.

The CDF will support 100-120 cooperatives during the Project life. These cooperatives are village based and distributed in the 10 Project Counties in Hechi and Baise. The target is to support development of local specialty product. Among the proposed specises, Mango and Walnut are arbors; Dragon Fruit, Mulberry, Bamboo, Camellia, Tea and Orange are shrubs; Wild Grape and Kiwi Fruit are vines, all of which are perennial plants. Therefore, there will be no frequent tillage or large-scaled land preparation. Production and quality are to be increased by agricultural techniques such as grafting and transplantation. Green and bio agriculture are the industries to be supported. Pest control will take physical methods or low-toxicity pesticides which will be strictly controlled. For livestock or poultry, stall feeding will be adopted for pigs and goats; and chicken will be mainly kept in orchards on household basis and will not involve large farms.

The CDF will also support tourist cooperatives and small-scaled infrastructure ad equipment for operation of cooperatives. These small-scaled activities will be invested and managed by cooperatives.

Small-scaled infrastructure under Component 2 includes small roads, water supply and irrigation facilities, which will be invested and supported by township government. Road construction include new roads and road upgrading in the village and the field to improve production conditions, as well as roads to processing places and market places. As roads are low-graded roads (3~3.5m road surface), construction scale will be small. Small-scaled irrigation facilities are irrigation ditches and water tanks (100~200m3 to collection rain) and will not involve establishment of dams or reservoirs.

Business Incubation Center under Component 3 will not involve new construction. Instead it will build on the existing offices. Therefore, there is not potential environmental and social impact.

	
<p style="text-align: center;">Walnut</p>	<p style="text-align: center;">Dragon Fruit</p>

	
<p style="text-align: center;">Goats</p>	<p style="text-align: center;">Local Pigs</p>
	
<p style="text-align: center;">Chicken in orchard</p>	<p style="text-align: center;">Water tank</p>

5.2 Environmental Benefit of the Project

5.2.1 Positive Environmental Benefit

Implementation of components and sub projects of the proposed Project will follow strictly regulations for environmental protection. Prevention and control measures will be implemented to minimize the impact from project implementation. Establishment of Bamboo, Camellia, Walnut and Grape will improve water and soil conservation, increase soil fertility, protect water resource, fix sand and mitigate karst degradation. It will be useful in absorbing waste gas, reduce noise, purify air and improve the ecological environment. Development of livestock or poultry will provide organic fertilizer, reduce pollution and improve soil fertility. Development of tourism will increase ecological tourist awareness, the environment of the Project Area will be secured and improved by promoting organic fertilizer, efficient chemicals and chemical free pest control approaches by the Project. As well, improved farmers' competences and environmental awareness will secure the environment improvement of the Project Area.

5.2.2 Negative Environmental Impact and Mitigating Measures

5.2.2.1 Potential Impact from Agricultural Production

(1) Environmental Impact During Implementation Period

Two types of waste water in project implementation: 1. Ground or soil preparation at the beginning of implementation can cause surface exposure; fertilizer can be washed away and run into rivers, canals and drainage so the suspended substance in the water could increase and affect the near waters; 2. Implementers produce waste water which would produce organic pollutant and impact the near waters.

During implementation period, there will be waste gas: ground maintenance, road maintenance and grading, construction of nurseries, burning of tree branches and straws, dust from transportation. The main pollutants include: TSP and PM10. Waste gas from machines and trucks include mainly Nox; waste gas from implementers burning coal or gas includes SO₂. Dust has a greater impact on the environment. NO₂, SO₂, but they have little impact as the projects are normally in the open air and dust is blown away quickly.

The noise during implementation period would come from transportation, ie. vehicles. But the construction area is wide and relatively decentralized and the number of vehicles is small, therefore, both urban and rural residents will be less affected.

Topsoil and vegetation will be the solid waste generated from construction of nurseries, sidewalk maintenance and woodland flattening and clearing. However, topsoil can return to the field and vegetation can be used as green manure

There will not be many workers at construction site as they are local residents who would go home after work. There will not be centralized implementation areas. Garbage generated from implementation will be in the village. The New Rural Development Program involves waste disposal, which means waste will be well managed and there will be little impact on the environment.

During the course of land preparing, planting and fostering, there will be damages to the vegetation, which will cause erosion. The number of some species would be decreased in some period.

If camellia, tea trees, mango, mandarin, mulberry and kiwi are established on slopes or flat land, the soil to be used is a thick layer. In preparing the land (soil), vegetation will be cleared but will cause little soil erosion. When the crops grow to a certain extent, the vegetation will be restored.

If dragon fruit, walnut, grape and bamboo are to be established in degraded karst mountain areas, erosion will happen as slopes are steep, with a thin soil layer and little vegetation. Once the vegetation is damaged, the soil will be washed away and the crops will not survive, and natural disasters could happen. Therefore, it is needed to be careful when preparing land for cropping on karst slopes. Land selection should consider the slope (not so steep), wind, sunshine and drainage (good drainage). And land preparing should be arranged in autumn and winter when there is little rain. Vegetation should be protected instead of being cleared. Damage to vegetation should be as little as possible. In addition to the main crops, it is recommended to grow bamboo, rendou, xiangchun and honeysuckle among rocks, which would enhance restore of vegetation.

(2) Environmental Impact in Operational Period

Application of pesticides and fertilizer will impact surface water and content of N and P will increase. Pesticide will be used for pest control. However, the pesticide to be used will be biological pesticide which has little poison and residue. Therefore, environmental impact is minimized. Pesticide is used only when there is pest epidemic so the application of pesticide is limited.

During operational period, there is potential pest epidemic due to the invasion of alien species and the destruction of human activities on regional ecological balance. Application of pesticide will increase when there is pest epidemic, and can cause damage to others and pollution.

Camellia, tea, mango, mandarin, mulberry and kiwi which are proposed for the Project, will be established on slopes and valleys. However, there will be only fruit harvest and pruning. There will not be further clearing (cutting), which would not cause degradation. /erosion. Dragon fruit, walnut, and grape have large root systems which are helpful for environmental improvement (soil conservation). Harvest of bamboo must cut the stems and can cause damage to vegetation. Therefore, it is recommended that rotation should be adopted in bamboo harvesting.

5.2.2.2 Potential impact from livestock or poultry activities

(1) Impact from implementation

Impact from establishment of livestock or poultry farm, is mainly from the establishment of stalls, i.e. air pollution caused by the dust from digging and moving soil and the transport of cement, lime, and sand, as well as the construction sites. Waste water from cleaning vehicles and drainage can also cause pollution. Other impact include noise from machines and transportation.

In degraded karst areas, establishment of stalls on degraded mountains, quarrying and deforestation are prohibited.

(2) Impact from operational period

Waste water from livestock or poultry farm is generated from cleaning stalls. Such waste water contains high percentage of COD and ammonia nitrogen.

Air pollution from livestock or poultry farm is the fugitive emission of malodorous gases which are generated in stalls, material ground and biogas tanks. Malodorous gas contains ammonia, hydrogen sulfide, methyl mercaptan, methyl sulfide, styrene, acetaldehyde and skatole which can impact the environment and affect the health of the people involved.

Solid waste from livestock or poultry farm include animal waste, residue from biogas tanks and animal dead bodies. Inappropriate disposal can cause impact on surface water and soil.

In livestock or poultry farm in degraded karst areas, uncontrolled goat grazing can cause big problems. The vegetation can be destroyed by goats when grazing is uncontrolled. In some areas, mountains are burnt down in winter to produce new and young grass and leaves for goats, which can worsen the degradation. Therefore, uncontrolled grazing and feeding on karst mountains are prohibited. Livestock or poultry farm must adopt stall feeding and pasture development, and maintain the balance between the number of animals and the pasture.

5.2.2.3 Environmental Impact from Rural Tourism Activities

(1) Impact from Implementation

When building holiday resorts or guesthouses, digging, filling and bulldozing can cause damages on the environment, ie. erosion, and spoil the beauty of the natural landscapes. Residue and materials stored in the open air at construction sites and transport of such residue and materials produce dust and air pollution. Waste water from cleaning vehicles and drainage can also cause pollution. Other impact include noise from machines and transportation.

(2) Impact from Operation

Tourists and guesthouses produce waste water and rubbish which could cause pollution in surface water when they are not properly disposed. New buildings may not match traditional style and the landscapes. Intensive tourist development can impact the environment and rare and endangered species may be damaged. For example, when using natural pits as scenic spots, environmental capability must be taken into consideration by specification of the number of visitors to avoid impact and damages from over development and human induced activities.



Natural Pit, the environment of Project Village.



Karst mountains, the environment of Project Village

5.2.2.4 Impact from infrastructure activities

(1) Negative Impact from Implementation

In implementation, infrastructure activities such as road upgrading, water tanks and irrigation system involve digging, filling and bulldozing, which can cause damages on the environment., ie. Erosion. Residue and materials storing in the open air at construction sites and transport of such residue and materials produce dust and pollute the air. Waste water from cleaning vehicles and machines as well as drainage can also cause pollution. Other impact include noise from machines and transportation. Establishment of road and water tanks on degraded karst mountains which involves digging, quarrying and tree clearing, is prohibited. Degraded karst mountains must be strictly managed using mountain closure and afforestation approaches. Water conservation activities to reduce erosion on karst mountains are encouraged.

(2) Impact from Operation

In operational period, infrastructure sub projects, e.g. roads, water tanks and irrigation facilities have little impact on the environment. However, noise and dust from vehicles and transportation will produce pollution. Operation of small irrigation (water diversion) systems will make change in water resource management (allocation). Small scale processing factories and market places will produce waste water and othe solid waste which need to be properly disposed, otherwise surface water will be polluted.

5.2.2.5 Environmental Impact from Storage Activities

(1) Impact from Implementation Period

In implementation, establishment of storehouses, market places and small processing factories involve digging, filling and bulldozing, which can cause damages on the environment., ie. Erosion. Residue and materials stored in the open air at construction sites and transport of such residue and materials produce dust and pollute the air. Waste water from cleaning vehicles and machines as well as drainage can also cause pollution. Other impact include noise from machines and transportation. Such activities are prohibited in degraded karst mountains as they will involve many people, many vehicles and intensive transportation, which can cause environmental problems.

(2) Impact from Operational Period

Operation of storehouses will have little environmental impact. However, cold storage involves refrigerant ammonia which has a potential impact on the environment if it leaks from regrigerators. Selection of location for storehouses must follow relevant regulations and environmental risk management plans must be prepared. Waste water from factories and drainage must be disposed and meet biotechnic standards before it is released into surface water.

5.2.3 Mitigating Measures

In responding to environmental impact from implementation and operation of various sub projects, the Framework has identified mitigating measures. Details are in Table 5.1-1 and Annex 2. There is still uncertainty in the Project, that is, new projects could be adopted during the implementation period. Mitigating measures should follow Annex 2, with degradation situation taken into consideration.

Table 5.1-1 Proposed Mitigating Measures (Note: this Table is a reference to Annex 2 that includes activity-specific mitigation plans)

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
Baise	Pingguo	Ponan Village Xin An Township	Dragon Fruit	Degraded land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for Agricultural production and mitigating measures for agricultural production in degraded karst areas
		Balong Village Guohua Township	Dragon Fruit	Potential degradation land	Mild degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Chami Village Taiping Township	Dragon Fruit	Potential degradation land	No degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Yangiang Village Taiping Township	Dragon Fruit	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Jilin Village Taiping Township	Dragon Fruit	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Xinmin Village Haicheng Township	Dragon Fruit	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Dingdi Village Haicheng Township	Dragon Fruit	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Gaole Village Haicheng Township	Dragon Fruit	Degraded land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
							production in degraded karst areas
		Liu An Village Jiucheng Township	Dragon Frui	Non-degradation land	No degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production
		Linlin Village Taiping Township	Mulberry	Potential degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Chami Village Taiping Township	Mulberry	Potential degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Longban Village Pozao Township	Mulberry	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Xingeng Village Jiucheng Township	Mulberry	Degraded land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Yongqi Village Haicheng Township	Mulberry	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Longpai Village Fengwu Township	Mulberry	Degraded land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Yongwang Village Bangxu Township	Mulberry	Degraded land	Severe degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
	Tiandong	Lianhe Village Xiangzhou Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
	Tiandong	Dingyang Village Xiangzhou	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Township					
		Daban Village Zuodeng Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Xin An Village Zuodeng Township 村	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Fuxing Village Naba Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Minzu Village Liinfeng Townshi	Bamboo	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Liangyu Village Silin Township	Bamboo	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Naban Village Yinc ha Township	Bamboo	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Lixin Village Yinch Township	Bamboo	Degraded Land	Extreme degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Liuzhou Village Naba Township	Bamboo	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
	Tianlin	Genbiao Village Baile Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Bangan Village Baile Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Boé Village Badu Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Zhetang Village Badu Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Nongguang Sanyao Village Lucheng Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Sanyao Village Lucheng	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Township					
		Wenhua Village Leli Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Baxin Village JAnding Townshi	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Zhenian Village Jiuzhou Townshi	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Pinglin Village Jiuzhou Townshi	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Guanglong Village Jiuzhou Township	Mango	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Gengbio Village Baile Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Bangan Village Baile Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Boé Village Badu Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Zhetang Village Badu Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Nongguang Village Lucheng Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Sanyao Village Lucheng Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Bazhong Village Zhemiao Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Baheng Zhemiao Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Pingbu Village Lizhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Wenhua Village Leli Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Balai Village Anding Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Changjin Villag Anding Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Baxin Village Jiuzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Zhenian Village Jiuzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Pinglin Village Jiuzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Guanglong Village Jiuzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
	Leye	Dacun Village Tongle Township	Kiwi	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Liuwei Village Tongle Township	Kiwi	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Dadao Village Gantian Township	Kiwi	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Banhong Village Gantian Township	Kiwi	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Huaping Village Huaping Township	Kiwi	Potential degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Bamu Village Huaping Township	Kiwi	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Tangying Village Luosha Township	Kiwi	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Leweng Village Xinhua Township	Tea	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Linli Village Xinhua Township	Tea	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Nawei Village Xinhua Township	Tea	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
	Donglan	Jiangdong Village Donglan Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Banlie Village QieXue Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Banlong Village Changjiang Township	Camellia oil	Degraded Land	Mild degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Antao Village Bashou Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Weirong Village Donglan Township	Chicken	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production
		Banlao Village Aidong Township	Chicken	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production
		Liutong Village Aidong Township	Chicken	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production
		Qixue Village Qixue Township	Chicken	Degraded Land	Medium degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Gengle Village Changle Township	Chicken	Potential degradation land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Renhe Village Sanshi Township	Chicken	Degraded Land	Medium degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Dongli Village	Tourism	Non-degradation	No degradation	Negative impact if not well	General environmental mitigating

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Wuzhuan Township		land		managed	measures for tourism development
Hechi	Bama	Dena Village Fenghuang Township	Pig	Potential degradation land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Changhe Village Fenghuang Township	Pig	Degraded Land	Medium degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Bana Village Xishan Township	Pig	Potential degradation land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Hele Village Xishan Township	Pig	Potential degradation land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Poteng Village Bama Township	Tourism	Degraded Land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development
		Banyang Village Bama Township	Tourism	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development
		Donglie Village Nashe Township	Tourism	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development
		Yanting Village Yandong Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Pingliu Village Suolue Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Langyin Village Suolue Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
	Fengshan	Changzhou Village Changzhou Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Nale Village Changzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Na Ai Village Changzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Banren Village Changzhou Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Banlun Village Changzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Langli Village Changzhou Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Nalao Village Changzhou Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Heyun Village Qiaoyin Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Nawang Village Qiaoyin Township	Camellia oil	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Shanglin Village Qiaoyin Township	Camellia oil	Degraded Land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Tongle Village Qiaoyin Township	Walnut	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Wenli Village Qiaoyin Township	Walnut	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Pocha Village Jinya Township 金牙乡坡茶村	Walnut	Degraded Land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Gengsha Village Jinya Township 金牙乡更沙村	Walnut	Degraded Land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
							production in degraded karst areas
		Longwang Village Jinya Township 金 牙乡陇旺村	Walnut	Degraded Land	Medium degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Yongji Village Yongan Township	Mulberry and Silk Cocoon	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Liuli Village Chengjiang Township	Chicken	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production
		Yuanli Village Bao An Township	Chicken	Potential degradation land	No degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Wudong Village Gaoling Township	Goat	Potential degradation land	No degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Yijiang Village Gaoling Township	Goat	Degraded Land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Jiacha Village Gaoling Township	Goat	Potential degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Nongming Village Gaoling Township	Goat	Degraded Land	Extremely severe degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Fuxing Village Gaoling Township	Goat	Potential degradation land	Medium degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural
	Du'an						

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
							production in degraded karst areas
		Jiating Village Gaoling Township	Goat	Degraded Land	Severe degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Jiaquan Village Gaoling Township	Goat	Potential degradation land	Mild degradation	Negative impact: worsening degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
	Dahua	Renliang Village Dahua Township	Grape	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Longma Village Dahua Township	Grape	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Jiacheng Village Duyang Township	Grape	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Jiasi Village Liuye Township	Grape	Degraded Land	Medium degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Longkou Village Dahua Township	Mandarin	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Dunsu Village Dahua Township	Mandarin	Non-degradation land	Mild degradation	Positive impact: improving degradation	General environmental mitigating measures for agricultural production
		Duyang Village Duyang Township	Mandarin	Degraded Land	Medium degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Zhongwu Village Duyang Township	Mandarin	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Wucheng Village Duyang Township	Mandarin	Non-degradation land	No degradation	Positive impact: prevent degradation	General environmental mitigating measures for agricultural production
		Huashan Village	Mandarin	Non-degradation	No degradation	Positive impact: prevent	General environmental mitigating

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Liuye Township		land		degradation	measures for agricultural production
	Yizhou	Yantian Village Liu San Jie Township	Mulberry and Silk Cocoon	Potential degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Gudong Village Liu San Jie Township	Mulberry and Silk Cocoon	Potential degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Guwen Village Xiangbei Township	Mulberry and Silk Cocoon	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Latuo Village Xiangbei Township	Mulberry and Silk Cocoon	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Baitun Village Anma Township	Mulberry and Silk Cocoon	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Xiao Ai Village Anma Township	Mulberry and Silk Cocoon	Degraded Land	Severe degradation	Negative impact if not well managed	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Latan Village Anma Township	Mulberry and Silk Cocoon	Degraded Land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Kenba Village Anma Township	Mulberry and Silk Cocoon	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Guyu Village Anma Township	Mulberry and Silk Cocoon	Non-degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production
		Baiwei Village Xiangbei Township	Mushroom	Potential degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Gudong Village Liu San Jie	Mushroom	Potential degradation land	Potential degradation land	No impact	General environmental mitigating measures for agricultural production

City	County	Village/Township	Proposed Industry	Degradation Land Type	Status quo of Degradation	Impact on Degradation	Mitigating Measures
		Township					and mitigating measures for agricultural production in degraded karst areas
		Yantian Village Liu San Jie Township	Mushroom	Potential degradation land	No degradation	No impact	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Baitun Village Anma Township	Mushroom	Degraded Land	Severe degradation	No impact	General environmental mitigating measures for agricultural production and mitigating measures for agricultural production in degraded karst areas
		Guwen Village Xiangbei Townshi	Tourism	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development
		Latuo Village Xiangbei Townshi	Tourism	Non-degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development
		Yantian Village Liu San Jie Township	Tourism	Potential degradation land	No degradation	Negative impact if not well managed	General environmental mitigating measures for tourism development

5.3 Social Impact

Formulation of social impact will follow the Social Impact Assessment Report. Social impact assessment provides assessment on project impact on the poor, women, minority groups and land requisition.

5.3.1 Review on Project Impact on the Poor Group

5.3.1.1 Positive Impact

(1) Enhanced industrial restructuring and developed direct industrial chain in market demand

The traditional model, still the main model in project village, is farming on household basis. Farmers involve in only production. Industry is not developed. Farm product is challenged by the market due to low production and quality. The Project will use the market as the entry point and try to largely increase poor households' income by supporting development of local specialties which would have better market expectation. The Project will also support development of Farmer Cooperatives and assist Cooperatives to establish connection with markets ends. It is expected to use such project intervention to improve rural economic development and restructure rural industries, and eventually improve the income of rural poor residents.

(2) Enhanced organizational level of farmers and improved farmers' competences and management skills

Individual household business is the main model currently. It is hard to improve marketing due to small scale of production and the lack of information. The Project will support setting up farmer cooperatives and through the cooperatives, put poor households together to form larger strength so that their production scale, quality and price are increased. It is, as well, expected to use Cooperatives to reduce the costs for farming and develop better markets. The Cooperatives, after established, should provide technical training and management training for poor households (members) as well as information. And through training and information provided by FC, poor households update their skills and knowledge, develop new competences and adopt new and better management models for their production.

(3) Improved infrastructure to improve rural residents' livelihood

The Project will improve the infrastructure in project areas so that villagers in project areas have the basic conditions for development of various specialties. Improved infrastructure will mean that the poor villagers have opportunities for development as infrastructure for production, tourism and for their own living is improved, which is significant for improving health and living standard of the targeted groups.

(4) Increased farmers' income by enhancing development of local specialty industries

The Project aims to increase poor households' income by enhancing the development of the existing specialty industries, e.g. expanding production scale, increase standardization and industrialization, as well as reduction in costs and increase in quality to secure better prices.

(5) Enhanced economic development of the whole project areas

The Project will drive the development of related industries and rural economy. It is helpful for industrialization and restructuring local industries. When the market is developed and expanded, there

will be more opportunities for income generation. At the same time, enterprises such as processing factories and storehouses will be set up and employment will be increased.

5.3.1.2 Potential Risks

(1) Livelihood risks

The costs for some of these industries are high. Poor households lack the start-up funds. The high costs and low affordability will directly affect the enthusiasm of households involved as well as the economic benefits of the Project.

(2) Technical Risks

Market based and chemical free, which is oriented for specialty industries, will need intensive management. However, poor households are still used to the extensive management model. This will not only affect the quality of the product but will break the industrial chains developed by the Project. Economic and credit losses will happen when the quality required by the sales companies is not fulfilled.

(3) Market Risks

Problems which may be raised from quality control, whether consumers accept the product and unpredictable problems will create risks for poor households who have only one product structure. Some industries, for example tourism, have not developed models to follow. How to develop a stable market is unclear.

(4) Sharing Risks

How to develop a profit sharing mechanism between Leaders of FC and poor households to achieve win-win result is a challenge and also one risk.

5.3.2 The Project Impact on Women

5.3.2.1 Expected Positive Impact

(1) Increased women's income by working at home

Industrial development provides opportunities for women to work at home. They can work and look after their families at the same time. Production can be organized in the form of cooperatives. Women's workload is reduced as they can take work suitable for labor force of the family. Women's income will increase if product quality is increased and the market is stable.

Women's capabilities will be improved. Through technical and management training and participating in FC operation, women's competences at all aspects and participation awareness will be improved.

(2) Improved living standard

Income will be increased by participating in project implementation and living standard will be improved. Women who handle social affairs (e.g. kids going to school, family members getting sick, presents for weddings and etc.) for the family will be more confident. Participation in FC opens a wider door for women to expose themselves to the community, through which they learn new things and update information.

(3) Improved both household and social status

When women must stay home looking after their families they have little income so their status is low. When they are involved in FC they have better income while looking after their families at home. Their skills, competences and awareness increase so their status both at home and outside will increase. Women participating in FC and training have a voice. In FC and training they are involved in discussion, recommendation and decision making so their voice is heard.

5.3.2.2 Potential risks for women

Social and economic surveys, interviews, workshops and internal discussion were undertaken to assess impact on women. The results indicate that in general the Project will enhance women's development and address problems of women and their families, and enhance women's strategic status. However, there is potential risks that women benefit little or are excluded from the Project if there is little gender awareness in project design, implementation and management. The potential risks are:

(1) Low level participation of women in FC

1) Low level participation of women in FC management and decision making. In over half of the existing FCs, there are no women managers. All FC leaders or directors are men. In some FCs, there are women at management level, but they work as assistants and are not involved in decision making. Therefore, in designing the Project Operation Manual, it is needed to specify the involvement of women in management and detailed measures for increasing gender awareness.

2) Low level participation of women in specific activities in FC. Members of FCs are households with men's names. It is very rare that households join in FCs in the name of women except that the man and the woman join in two different FCs. In connection with the market, sales and related decision making involve mainly men. Women rarely are involved in decision making. Only when the man is not at home, the woman has a chance to participate. Even though, women have no voice in such cases. In related training, participants are mainly men. If such trend is not reversed, the gap between men and women will be expanded, which will create negative impact on women.

(2) Increased women's workload

In industrial development of FCs, there will be both employment opportunities and increased workload for women. If women from poor households obtain profit not by shares of land and investment, instead, by providing labor force (working), their workload will be largely increased.

5.3.3 Impact on minority groups

From the attitude of minority groups in project areas, they support and accept the Project and the development of FCs. Project activities will bring no conflict to their original livelihood, culture and traditions. No potential risk has been found from the perspective of development of minority groups in social impact assessment.

Identification, analysis and screening of minority groups show that there are Zhuang, Yao, Miao and Maonan ethnic groups in project areas, and it is more important that they are the vast majority, taking up most of the population. These ethnic groups have their own features in social structure, culture, traditions, languages, social communication and religions which are different from the main stream. To identify the real need of these groups and make sure project activities and implementation fit in their culture, World Bank social specialists and the SA team decided there is a need to formulate a Ethnic Minority Development Framework which is in Annex 5.

5.3.4 Impact from Land Acquisition and Demolition

It has been confirmed that Land acquisition and demolition will be involved in Component 1-3: development of Pro-poor Value Chains; Infrastructure; Poverty Reduction Industries and Financial

Support, in Bama, Leye and Pingguo Counties. It is predicted that collective and state own land is involved. Component 1 in other counties will involve land use and adjustment inside the community, as predicted. Some ground structures and attachment will be broken down or removed but no houses are involved. The scale and number of households are not clear. Plans are being worked on. As required by the Bank, a Resettlement Policy Framework has been formulated and the details are in Annex 3.

5.4 Conclusion of Review on Impact

General impact from Project activities are summarized in the following table

Table 5.4- 1 Comprehensive Review on Impact from Project Activities

Environment Activity	Natural Environment			Social Environment		
	Ecosystem	Solid Waste	Air	Living Standard	Compensation	Local Economy
Afforestation						
Mulberry	+/-		+	+		+
Camellia	+/-		+	+		+
Walnut	+/-		+	+		+
Mango	+/-		+	+		+
Infrastructure						
Passage	-	-	-	+	-	+
Water Tank				+	-	+
Storehouse	-	-	-	+	-	+
Tourism						
Homestay Hotel	-	-	-	+	-	+
Livestock						
Pig	-	-	-	+	-	+
Goat	-	-	-	+	-	+
Chicken	-	-	-	+	-	+
Note: “+” means benefit/profit “-” means negative impact “+/-” means both						

6 Procedures to Address Environment and Social Safeguards Issues

6.1 Summary

Figure 8 indicates the procedures for processing environmental and social security issues for sub projects accepted by the Project. The main procedures include:

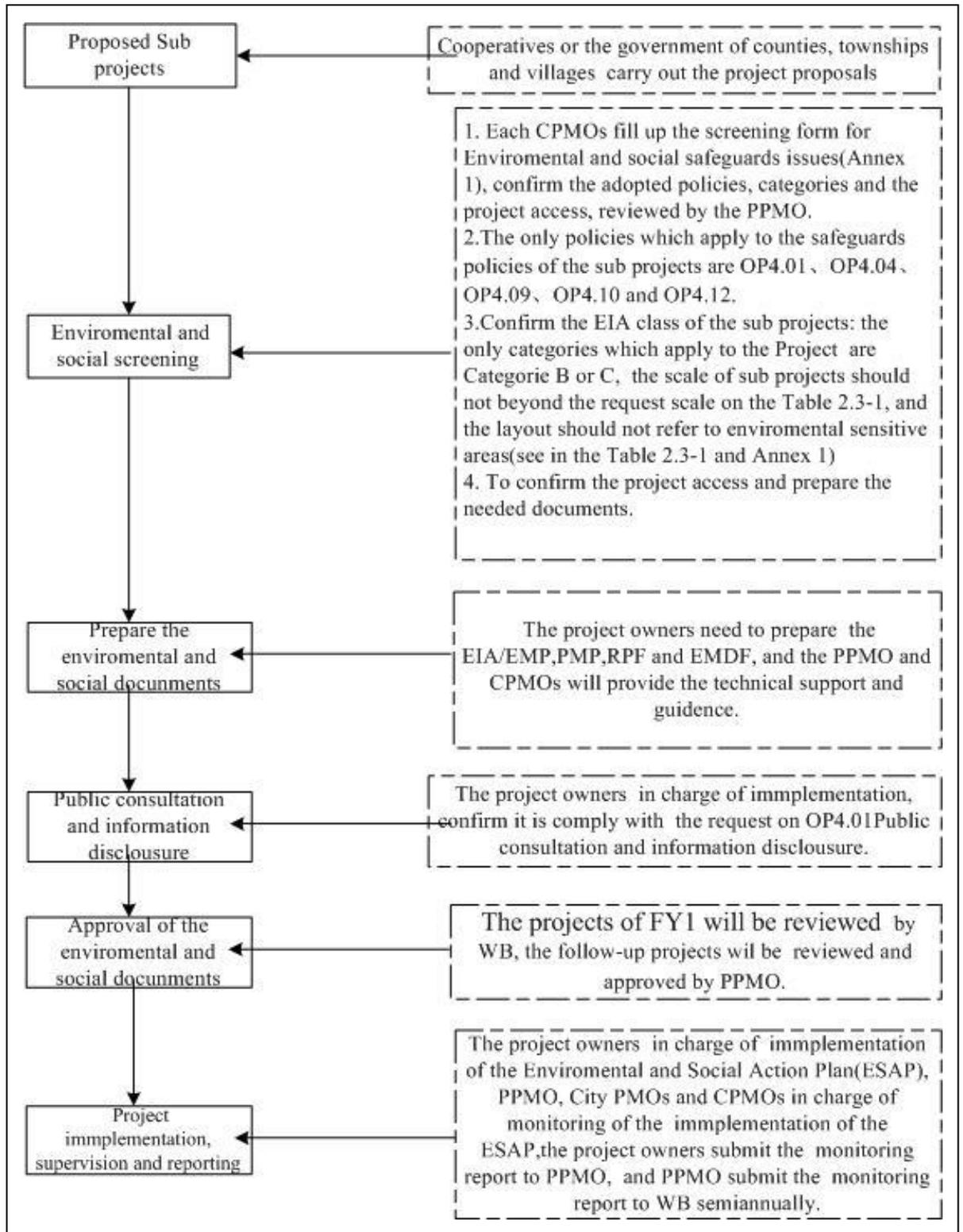
1. Proposals. Sub projects can be proposed by FC (individual households submit applications to FC) or enterprises. The proposals will then be submitted to County Project Offices. At county level, the proposals will be screened using the review forms in Annex 1. Referring to related national policies and regulations, the Provincial Project Management Office will identify the level and the feasibility of the proposed projects.

2. After screening, the project applicant is asked to prepare environmental and social impact assessment documents. Some will be asked to submit generic environmental management plans and disease and pest management plans. If the proposal involves land requisition, a resettlement plan is needed to be prepared in accordance with the resettlement policy framework. Minority group development plan applies to projects whose implementers are minority groups.

3. Public Participation and Information Disclosure. Information disclosure can be conducted on the internet, in newspapers or posters. Information include basic information of the project, EIA processes, conclusion of the EIA and how the public obtains EIA report. EIA report can be electronic or in paper. Public involvement shall adopt questionnaire, interview, consultation and others. The first projects will be responsible by the Bank, ie. disclosed by the Bank on the Bank's website. Sub projects approved later which are responsible by provincial PMO, will be disclosed on local public notice board and government websites.

4. Following the above documents, the first projects will be reviewed by the Bank to ensure the operation of the projects, and then by provincial PMO, according to the situation of the sub project

5. Project Implementation. First, the implementer of the project must be clear. In general, implementers are households, cooperatives or enterprises. And then the supervisor shall be identified. Normally, supervisors are County PMO, Environmental Protection Bureau or Water Resource Bureau. Supervising shall be undertaken in quarterly basis. Supervising content includes operation of environmental facilities and implementation of water and soil conservation measures. If any environmental issue is found, County PMO shall be informed and the implementing agency is asked to take actions immediately.



6.2 Screening of Sub Projects (step1)

Sub projects under the Project will be specified during the Project implementation period. Only those which meet the conditions for entering the Project are funded. According to the principles for entering the Project, safeguard policies which apply to the Project are: OP4.01 Environmental Assessment; OP4.04 Natural Habitats; OP4.09 Pest Management; OP4.10 Indigenous People; and OP4.12 Involuntary Resettlement any sub project classified as Category A, ie. with potential major environmental and social impact, will not be adopted.

Project planning uses participatory approaches. Sub projects are proposed by FCs (individual households submits application to FCs and enterprises (which are funded by counterpart funds) during the Project implementation period. The first screening is conducted at county level by County PMO. The proposals are then screened at Provincial level using Annex 1 to identify the category of the project. If the project is identified as Category A, it will not be supported by the Project. If a project is classified as Category B or C, that means it will go into next step. Provincial and County PMOs save the completed and signed screening forms. Annex 1 provides guidelines for filling the screening forms for environmental and social safeguards issues.

6.3 Preparing Environmental and Social Documents (step 2)

Annex 2 and 4 provide a generic environmental management plan and a pest management plan. They apply to the first sub projects entering the Project. The later sub projects, if needed, will be improved by the applicants according to the environmental and social issues. Annex 3 provides a resettlement policy framework. Sub projects involving land requisition and resettlement must provide resettlement plans which shall be prepared by the social impact assessment agency entrusted by the PMO.

For agricultural production activity- the Project may support dragon fruit, camellia oil, walnut, bamboo, grape, mandarin, kiwi and tea. which will be established on karst mountains and slopes. Annex 2 Part 1, Project Generic Environmental Management Plan provides requirements for selection of locations, species, implementation, land preparing, planting and maintenance. They must have the impact in reducing erosion, water pollution, pesticide, agricultural solid waste and potential physical cultural resource. For the agricultural production in degraded karst areas, the Generic Management plan provides special requirements for seeds, nursery, planting and management.

Annex 4, Pest Management Plan provides approaches, measures, implementation arrangement, management and monitoring which are based on IPM.

Sub project owners (a farmer cooperative) should provide supplement to the Generic Environmental Management Plan, according to the environmental and social screening for agricultural production sub projects.

For livestock or poultry farm, the Project would support pig, goat, yao chicken, black chicken and mulberry an silk cocoons. Main stalls include small scaled pig styles, goat stalls and chicken stalls. Annex 2 Part 2 , generic environmental management plan provides requirements for selection of locations, implementation and operation for livestock or poultry farm. They must have the impact in reducing erosion, water pollution, noise, odor, solid waste and potential. For the livestock or poultry farm in degraded karst areas, the Generic Management plan provides measures for preventing erosion, vegetation damage and waste pollution.

Annex 2 Generic Environmental Management Plan provides details for livestock disease control,

veterinary methods used, implementation arrangements and requirements for management and monitoring.

Sub project owners (a farmer cooperative) should provide supplement to the Generic Environmental Management Plan, according to the environmental and social screening for livestock or poultry farm sub projects.

For infrastructure sub projects, the Projects would support small-scale activities such as roads, water tanks and water diversion facilities. Part 3 of Annex 2 generic environmental management plan provides requirements for selection of locations during design, implementation and operation periods. They must have the positive impact in reducing erosion, air and water pollution, noise, smell, solid waste and potential. For the agricultural production in degraded karst areas, the General Management plan provides measures for preventing erosion, vegetation damage and waste pollution, avoid potential reverse impact on physical cultural resources. This plan provides measures for erosion control and prevention, vegetation damages and soil and water conservation.

Sub project owners (a farmer cooperative or local government) should provide supplement to the Generic Environmental Management Plan, according to the environmental and social screening for infrastructure sub projects.

Storehouse sub projects---The Project supports development of warehouses, refrigerators, small farmers market, and small-scale processing enterprises. Part 4 of Annex 2 generic environmental management plan for small scaled infrastructure, provides requirements for selection of locations during design, implementation and operation periods, as well as measures for reducing erosion, air and water pollution, noise, smell, solid waste and potential. For the agricultural production in degraded karst areas, the General Management plan provides measures for preventing erosion, vegetation damage and waste pollution, avoid potential reverse impact on physical cultural resources. In degraded karst areas, such sub projects should be avoided.

Project owners (a farmer cooperative or local government) should provide supplement to the Generic Environmental Management Plan, according to the environmental and social screening for storehouse sub projects.

For tourism activity---the Project would support tourism related sub projects, including homestay and guesthouses. Part 4 of Annex 2 provides generic environmental management plan for tourism, provides requirements for selection of locations during design, implementation and operation periods, requirements for coordination between buildings and artificial landscapes, measures for reducing erosion, air and water pollution, noise, smell, solid waste and potential cultural resources. Dissemination of environmental protection knowledge is required .

Sub project owners (a farmer cooperative or Village Committee) should following screening of environmental and social issues which may be raised from tourism, and provide necessary supplement.

6.4 Information Disclosure and Public Consultation(step 3)

Information disclosure and public consultation include two types of documents: 1. Environmental and Social Management Framework and attachments. 2. environmental and social documents of sub projects which will be prepared during implementation period.

In compliance with OP4.01, information disclosure and public participation has been undertaken

for the Environmental and Social Management Framework and its attachments, and Social Assessment when preparing the Project. Details are in Chapter 9.

During project implementation, in principle, information disclosure and public participation shall be conducted for environmental and social documents of sub projects. Impact of sub projects should be considered. Sub project design and implementation should be combined with public participation (consultation). Information disclosure and public participation must meet the requirements of national regulations and the Bank's OP4.01.

Owners of sub projects are responsible for information disclosure and public participation, and submit the records of public participation and environmental and social documents to provincial PMO. Provincial PMO save the submitted documents in sub project file.

Content of sub project information disclosure and public participation should include:

- When shall the public be informed to participate? Sufficient time should be given to the public to participate (not less than two weeks). The documents should be publicized in sub project areas, such as village committee, information center of the local government.
- How and where shall public participation be undertaken? Meetings, interviews and questionnaires.
- Main environmental and social problems
- Agreed measures to address the above environmental and social issues.

The above records of public participation should be together with environmental and social environment documents publicized at local level.

6.5 Review and Approval of the Environmental and Social Documents (Step 4)

Within the Project Management Framework, provincial PMO is responsible for review and approval of all environmental and social documents. If a sub project, according to the EIA Law and other regulations, is required to be submitted to department in charge for improvement, the owner of the sub project must prepare documents and submit for review and approval.

6.6 Implementation, supervision, monitoring and reporting (Step 5)

Environmental and social documents must be enforced and implementation. Sub project owners must make sure the environmental management plan, pest management plan, resettlement plan and minority group development plan are implemented. Provincial, City and County PMOs supervise sub project owners to make sure the measures are implemented.

In designing sub projects, owners must make sure environmental protection and selection of locations and other environmental protection instruments are included in detailed activity design. Sub projects which need contractors or implementing agencies, should integrate measures into bidding documents and construction contracts, to make sure contractors or implementing agencies implement environmental protection instruments.

When implementing sub projects, owners will regularly report to County PMO on project progress. Progress reports should include implementation progress of environmental and social documents, including environmental and social issues and instruments adopted. County PMOs submit documents to provincial level. If problems are found, PMO at all levels should be called for meetings with related departments to identify problems. Field visit to identify solutions should be undertaken if necessary.

Provincial PMO should submit 6 month report on project progress, including implementation progress of environmental and social action plans of all sub projects, main problems and solutions and schedule.

7 Grievance Redress Mechanism

The Project has established a transparent and effective complaint and grievance mechanism to make sure, during project application and implementation, villagers' complaints are received and implementation and land acquisition area successful. The complaint channels are still valid during project implementation so that the affected people are able to process related issues in a timely manner. The basic grievance channels are as follow:

Stage 1: If villagers are not satisfied with project plans and implementation, they shall make an oral or written grievance to the Village Committee. When there is an oral complaint, the Village Committee must process and keep written records, which shall be addressed or responded within two weeks

Stage 2: If villagers are still not satisfied with the responses of Stage 1, they can make grievance to the Township PMO after receiving the response. The PMO should respond within 2 weeks.

Stage 3: If unsatisfied, villagers can make grievance to the County PMO after receiving the response of the PMO. The County PMO should respond within 30 days

Stage 4 Those who are still unsatisfied can raise an administrative litigation to the City Courthouse. All grievances and responses will be kept by County PMOs.

The affected can make grievance related to all aspects of project plan and implementation, including the selection of beneficial households. The above grievance channels and the name, location, responsible persons, telephone numbers of processing agencies will be made known among farmers by publicizing at meetings and announcements so they are fully aware of their grievance rights.

All relevant institutions will accept project households' complaints and grievances for free. The relevant expenditures will be reimbursed from the unexpected costs of the project. The grievance procedure is valid through the whole project implementation period to guarantee farmers are able to use it to deal with related issues. Processes for Complaint and Girevance are indicated in Figure 9

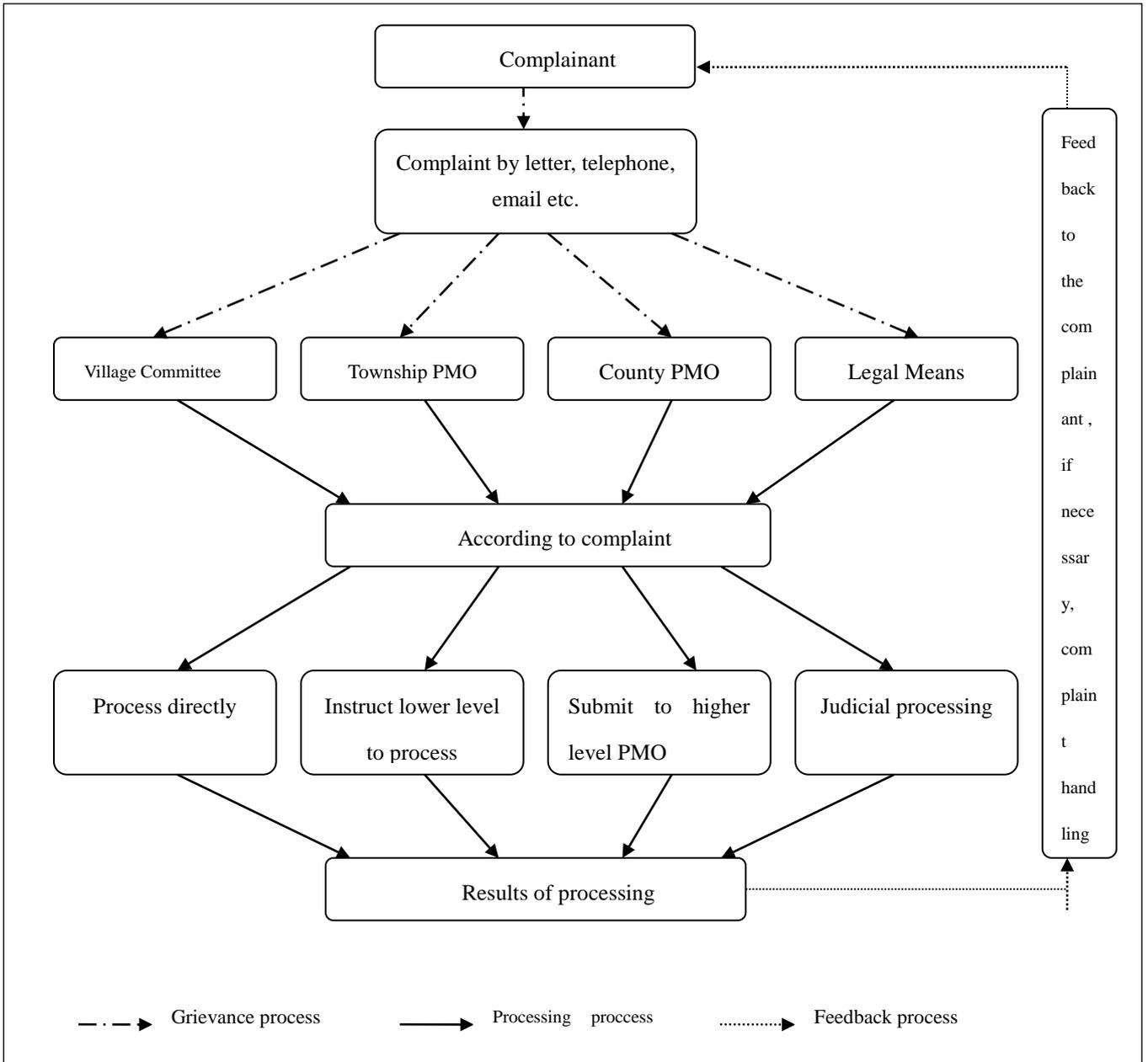


Figure 9 Grievance Processes

8 Public Consultation and Information Disclosure

Public participation is a method through which the attitude and views of the public towards construction project are understood. As well, it provides an opportunity for the public to participate in environmental impact assessment (EIA). Public participation makes environmental assessment more democratic and more open. It avoids the one-sided decision-making and reduces objection in future implementation. Under the Law of the People's Republic of China on Environmental Impact Assessment and relevant regulations of the World Bank, EIA must take opinions of the public into consideration.

1. Allow public participation in understanding of project objectives, scale and location, as well as the potential pollution on the surrounding areas and measures to be taken for such pollution during project implementation and operation. Allow the public to make opinions so that the project is understood and supported.

2. Consultation with the local resident on the experiences and feelings on their living environment will help to review the current conditions and standards of all relevant environmental elements, allow the EIA to be more objective and protect the benefits of the public.

Household surveys were made in project areas to have a better view of the situation.

Guangxi Foreign Capital Poverty Reduction Project Management Center (Guangxi PMO) together with all relevant agencies of 10 project counties (cities) have been carrying out a series of surveys and public opinion consultation since November 2014. During the project preparations, the social assessment report team and project feasibility report agency and EIA agency have publicized the relevant project information. and carried out the informed consultation and adequate public participation in advance. Public consultation and participation have been early and fully conducted.

(1) Informed and Publized Project Information

1) 117 Project Villages were selected out of 200 candidate villages in 10 Project Counties between July 2015 and March 2016, by open competition after mobilization was undertaken.

2) In the last six months of 2015, 10 project county (city) PMOs selected 2-3 project villages respectively in each county, held early publication on project objectives and approaches and promoted the local community to prepare the establishment of the cooperatives.

3) From November 2015 to Apr 2016, project information was disseminated through the processes of social impact assessment (SIA), EIA and feasibility study.

(2) Public Consultation and Survey in the field

SIA public consultation and survey: SIA formulation group carried out field surveys in the project areas, visited all involved 10 Counties (cities) from November 2015 to April 2016. By means of questionnaires, meetings and interviews, the group had a fair comprehension of the production and living conditions of the relevant project households and made detailed records about their comments and suggestions on project implementation. Consultation workshops and group discussions were organized to consultate with and interview relevant stakeholders Details are in Table 8.1-1.

Public consultation and surveys for project feasibility study: WB Feasibility Study Group carried out field visits in 10 Project Counties (cities) from July to September 2015, consulting with the public and collecting public opinions for the feasibility study of the Project, in the form of workshop, interviews and disucussions, which involved villagers, representatives of dragon-head companies and government officials. Public participation was helpful for improvement of the Report on Feasibility Studies. Details are in 8.1-2.

Public consultation and survey for Environmental Impact Assessment: EIA development group carried out field visits in 10 Project Villages in 5 Project Counties (cities) between January and March of 2016. By means of seminars and discussions, the Group identified environmental problems in Project Villages and potential impacts of WB project. Villagers and village leaders were involved. Records were made and integrated into the EIA Report. Details are in Table 8.1-3.

Development of the SIA Report, Feasibility Study Report and the EIA Report mentioned above were based on the results of the questionnaire, focus interviews and workshops involved by the public.

Table 8.1-1 Summary of Public Participation in SIA Surveys

Type of participation	Time	Venue	Contents of Activity	Participants	Numbers of People	Note
Informal talks and interviews with relevant departments	July 2015 to March 2016	PAO of all the project counties (cities), WB Office	<ol style="list-style-type: none"> 1. Each department introduced about poverty alleviation status of the department; 2. Discussed about main difficulties in poverty work in the county; 3. Exchanged on the poverty alleviation projects implemented by all the departments; 4. Which works did the initial working department of WB Project participate; 5. Discussed about feasibility of main industries in the project from different perspectives; 6. Analyzed possible impacts of WB project from different perspectives; 7. Problems and difficulties in implementation, as well as suggestions 	Leaders from main departments of 10 counties (cities), mostly being leaders from the main departments pegging with the project, such as the Agricultural Bureau, the Forestry Bureau, the Animal Husbandry Bureau, the Agroecomic Station, the PAO, the Nationalities Bureau, the Women's Federation, the Development and Reform Bureau, the	A total of 10 informal talks were held in the 10 project counties (cities), including 51 interviews with relevant departments of the government. With more than 150 attendants, in which women accounted for 20%	All the leaders of relevant departments were prepared before attending the informal meetings, many of them prepared materials beforehand, and some departments had more than 2 attendants in the informal meetings.

				Communication Bureau and the Tourism Bureau, etc.		
Informal talks with leading enterprises	July 2015 to March 2016	PAO of all the project counties (cities), WB Office	<ol style="list-style-type: none"> 1. Each leading enterprise introduced basic information about themselves 2. Difficulties the enterprise encountered in production and sales; 3. Cooperation status between the enterprise and the cooperatives; 4. Plan of the enterprise to cooperate with the cooperatives in future; 5. Completed a questionnaire 	The relevant persons in charge of 19 agricultural companies, the main attendants in the informal talks were the persons in charge of the enterprises, legal representatives or main managers of the main enterprises.	Totally interviewed 19 enterprises, with more than 20 attendants, including 2 women	All being local enterprises from the project counties
Interviews with cooperative managers	July 2015 to March 2016	All the project counties (cities)	<ol style="list-style-type: none"> 1. Basic information about the cooperatives; 2. Main products of the cooperatives; 3. Requirements and procedures for farmers to join; 4. Management of the cooperatives; 5. Information about the persons in charge; 6. Sales channels; 7. Distribution of interests; 	Managers' representatives from 23 cooperatives	Totally interviewed 23 cooperatives, with 48 attendants, including 7 women and 36 ethnic minority people	Including cooperatives of non-project villages

			8. Advantages, disadvantages and difficulties in operation			
Discussing with village cadres and villagers' representatives	July 2015 to March 2016	All the project counties (cities)	<ol style="list-style-type: none"> 1. Basic information about the administrative villages; 2. Discussing about production and sales of agricultural products; 3. Development status of leading industries; 4. Conditions of the cooperatives; 5. Status of loans 	Village cadres and villagers' representatives from the sample villages	Totally held 29 group discussions, with 141 attendants, including 11 women and 108 ethnic minority people	
Informal talks with representatives of poor households	July 2015 to March 2016	29 sample villages in 10 project counties (cities)	<ol style="list-style-type: none"> 1. Advantageous conditions and difficulties for poor households to participate in the main industries 2. Attitudes of the poor households about the planned industries 3. Analyzing and discussing about restrictive factors for developing industries 4. Expectations about establishing cooperatives for developing industries 5. Expectations about the project 	Representatives of poor households from 29 villages	Totally organized 29 informal talks with the poor households, with 169 attendants, including 8 women and 150 ethnic minority people	
Informal talks with women's	July 2015 to March	29 sample villages in 10	1. Advantageous conditions and difficulties for women to participate in the main	Women's representatives from 29	Totally organized 29 informal talks	

representatives	2016	project counties (cities)	industries 2. Attitudes of the women about the planned industries 3. Analyzing and discussing about restrictive factors for developing industries 4. Expectations about establishing cooperatives for developing industries 5. Expectations about the project	villages	with the poor households, attended by 162 women, including 112 women from poor households and 149 ethnic minority people	
Sampling investigation with target groups	July 2015 to March 2016	29 sample villages in 10 project counties (cities)	Conducting questionnaire investigation to the farmers, learning their basic information and livelihood status, as well as their understanding about, attitude toward and needs for the cooperatives and the project	560 farmers	More than 600 people were sampled from 560 households in 29 households, 10 counties for visiting, in which: Women: 210 Poor households: 362 Ethnic minority: 514	Note: In some families, several people participated in investigation and feedbacks
Interviewing	April 2016	5 project	Held information talks with the enterprises	Company	Totally 16 people,	

potential incubation center		counties	willing to participate in the incubation center, and constituted the idea for operating the incubation center as a company.	representatives and PMO staff	in which 10 were persons in charge of enterprises, including 3 women	
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Source of Data: Collation of investigation data for social assessment.

Table 8.1-2 General descriptions about public participation in feasibility study

Type of participation	Time	Venue	Contents of Activities	Participants	Numbers of people	Note
Holding informal talks with and visiting relevant departments, project townships and leading enterprises	July 2015 to September 2015	All the project counties and cities	<ol style="list-style-type: none"> 1. Basic socioeconomic conditions and poverty status of the county 2. Standards, process and results of selecting the project villages and industries; 3. The development overview of the selected industries, plan, advantages and inputs; 4. Status quo of development of the cooperatives; 5. Ideas and expectations of all the departments and project townships about the project; 	People in charge of Development and Reform Bureau, Poverty Alleviation Office, WB Office, Forestry Bureau, Agriculture Bureau, Animal Husbandry and Aquatic Products Bureau, Tourism Bureau, Financial Office, project townships, representatives from county	Totally interviewed 141 people, including 20 women	

			<p>6. Overview of leading enterprises, status quo of cooperation with the farmers, and possibility of participation in project construction;</p> <p>7. Collecting basic data and relevant planning content, etc.</p>	<p>level project experts consultancy committee, representatives from leading enterprises and representatives from such banks as rural credit cooperatives, etc.</p>		
<p>Interviewing managers of cooperatives, village cadres and villagers' representatives</p>	<p>July 2015 to September 2015</p>	<p>All the relevant project villages in all the project counties and cities</p>	<p>1. Basic information about the villages, as well as level of understanding about the project, etc.</p> <p>2. Situation of villages or cooperatives participating in competitive selection of project villages;</p> <p>3. Status quo of development and construction preparation of cooperatives, problems and needs;</p> <p>4. The needs and plan of villages or cooperatives for participating in project construction;</p> <p>5. Causes for selecting the industries, advantages, development status quo and</p>	<p>Managers of the already established cooperatives, representatives from the cooperatives prepared to be established, party secretaries of the villages, village heads, women's director of the villages, representatives of poor households and women/s representatives</p>	<p>68 people from 11 villages. In which: Women: 23 Poor people: 30</p>	

			<p>input – output status, as well as difficulties and needs of industrial development;</p> <p>6. The means of operation and profits distribution of the cooperatives and the supports to the poor households, etc.</p>			
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Source of Data: Collation of investigation data for feasibility study.

Table 8.1-3 Overview of Public Participation in Consultation in the course of Environmental Impacts Assessment

Type of participation	Time	Venue	Contents of activities	Participants	Number of people	Notes
Informal talks with representatives from communities subject to environmental impacts of the project	January – March 2016	Sampled 10 project villages from 5 project counties, and held informal talks in the villages	Held informal talks with villagers to learn current environmental problems in the project villages, conditions of the project planned to be implemented, and treatment measures for current environmental impacts, etc.	Village cadres and farmers' representatives from the project villages	75 attendants In which: Representatives of poor households: 18 Women's representatives: 21 Ethnic minority people: 58	The main current environmental problems of the project villages included: Lack of water, being stony desertified mountainous areas; the project planned to be implemented in the project villages was goat raising, the status quo is the raising mode of semi-captivity and semi-stocking, with goats bred in small grassland in the mountains, with small scales; the

						current control measures for environmental impacts mainly included ecological forests, constructing water tanks for storing water, concentrated incineration of municipal solid wastes, and using goat excrements as manure.
Informal talks with representatives from enterprises subject to environmental impacts of the project	March 7, 2016	Poverty Alleviation Office of Leye County	Holding informal talks with the representatives of the cooperatives and the enterprises to learn the current environmental problems of the project village, the conditions of project planned to be implemented, and control measures for current environmental impacts, and pest control status.	Informal talks with the representatives of the cooperatives and the enterprises	13 people attended the informal talks In which: Representatives from enterprises: 7 Representatives from cooperatives: 5 Women's representatives: 3	Leye County is a national demonstration county for organic agriculture, where the farmers understand organic agriculture relatively well, and the regional environmental problems mainly include: Lack of water, being stony desertified mountainous areas with incomplete infrastructures such as roads; the project currently implemented in the project village include growing tea and kiwi fruit.

Source of Data: Collation of investigation data for environmental impacts assessment.

8.1 Survey Methods

Public participation adopted mainly interviews, ie. information was collected by interviews and questionnaires, while the general methods are quantitative or semi quantitative surveys. Through questionnaire, quantitative surveys provide accurate statistics and semi-quantitative surveys are more flexible. Social surveys allow deep understanding of the impact from the Project on local environment and economy.

8.2 Survey Methods and Results

8.2.1 SIA Surveys

The SIA development group carried out field visits in the 10 Project Counties (cities) between November 2015 April 2016. By means of questionnaires, meetings and interviews, the group had better comprehension on the production and living conditions of households to be involved in the Project and made detailed records for their comments and suggestions on project implementation. Consultations with villagers and group discussions were organized, through which the Group interviewed relevant stakeholders.

(1) Survey targets and percentage

The public participation surveys involved people in the impacted areas. Occupation, gender, age, nationality and educational backgrounds are in statistic table 8.2-1 – 8.2-4.

Table 8.2-1 Age of Surveyed Groups

Age	Male		Female		Summation	
	Numbers	%	Numbers	%	Numbers	%
≤6	125	9.16	85	7.4	210	8.4
7-17	215	15.7	150	13.0	364	14.5
18-35	453	33.1	373	32.3	825	32.8
36-50	327	23.9	290	25.1	616	24.5
51-60	209	15.3	185	16.0	394	15.6
≥61	38	2.8	72	6.3	110	4.4
Subtotal	1366		1154		2520	

Table 8.2-2 Education of Surveyed Households

Education status	Male		Female		Summation	
	Numbers	%	Numbers	%	Numbers	%
Illiterate	155	11.4	259	22.4	414	16.4
Primary school	435	31.8	402	34.8	837	33.2
Junior high school	508	37.2	315	27.3	823	32.7
High school or	154	11.3	100	8.7	254	10.1

Technical Secondary School						
junior college	110	8.2	72	6.2	182	7.2
Undergraduate	4	0.3	6	0.5	10	0.4
Master degree or above	0	0.0	0	0.0	0	0.0
Subtotal	1366		1154		2520	

Table 8.2-3 Employment of Surveyed Households

Occupation	Male		Female		Summation	
	Numbers	%	Numbers	%	Numbers	%
Farming	560	41.0	620	53.7	1180	46.8
local business/processing	24	1.8	24	2.1	48	1.9
Soldiers/polices	3	0.2	2	0.2	5	0.2
Civil servant	14	1.0	7	0.6	21	0.8
Retired	1	0.1	0	0.0	1	0.0
Employees in local private enterprises	14	1.0	8	0.7	22	0.9
Long-term migrant workers	219	16.0	116	10.1	335	13.3
Short-term migrant workers	41	3.0	22	1.9	63	2.5
Housewife	8	0.6	9	0.8	17	0.7
Village cadres	66	4.8	13	1.1	79	3.1
Students	276	20.2	200	17.3	476	18.9
Others	140	10.3	133	11.5	273	10.8
Subtotal	1366		1154		2520	

Table 8.2-4 Ethnic Groups of Surveyed Households

Nationality	Male		Female		Summation	
	Numbers	%	Numbers	%	Numbers	%
Zhuang nationality	1088	55.1	886	44.9	1974	78.3
Yao nationality	115	41.6	161	58.4	276	11.0
Miao nationality	0	0.0	2	100.0	2	0.1
Maonan nationality	2	40.0	3	60.0	5	0.2

Dong nationality	0	0.0	0	0.0	0	0.0
Hannationality	152	62.6	91	37.4	243	9.6
Others	7	35.0	13	65.0	20	0.8
Subtotal	1364	54.1	1156	45.9	2520	100.0

Table 8.2-1 and Table 8.2-4 indicate the surveyed targets include people from all walks of life including farmers and leaders aged from old to young, educational degree from primary school to university graduates. Ethnic groups were involved. The SA survey is highly representative, random and convincing.

(2) Survey content

Results of surveys are in the following table (referred to SIA)

Table 8.2-5 The project participation information table

		Han nationality		Zhuang nationality		Other nationality		Total household	
		HH	%	HH	%	HH	%	HH	%
Have you heard of World Bank loan poverty reduction project?	● yes	21	45.7	234	51.5	20	33.3	275	49.1
	● no	25	54.4	220	48.5	40	66.7	285	50.9
Which sources have you heard of the Project?	● from village meeting	17	81.0	146	62.4	14	70.0	177	64.4
	● heard from other people	4	19.1	39	16.7	3	15.0	46	16.7
	● seen from the publicity	0	0.0	22	9.4	0	0.0	22	8.0
	● form this time of survey	0	0.0	22	9.4	2	10.0	24	8.7
	● others	0	0.0	5	2.1	1	5.0	6	2.2
Have you known of what does the project	● Very clear	5	23.8	40	17.1	1	5.0	46	16.7
	● majority	4	19.1	63	26.9	5	25.0	72	26.2

is planning to do ?	understand								
	● litter understand	5	23.8	66	28.2	9	45.0	80	29.1
	● Know very little	5	23.8	49	20.9	4	20.0	58	21.1
	● not clear	2	9.5	16	6.8	1	5.0	19	6.9

Table 8.2-6 Farmers' attitude and understanding on the cooperative projects

		Han nationality		Zhuang nationality		Other nationality		Total household	
		HH	%	HH	%	HH	%	HH	%
Is it important for your family to increase income through the Project or not?	● Very important	16	76.2	150	64.1	10	50.0	176	64.0
	● important	4	19.1	76	32.5	9	45.0	89	32.4
	● Common important	0	0.0	6	2.6	1	5.0	7	2.6
	● not very important	1	4.8	1	0.4	0	0.0	2	0.7
	● Has nothing to do with my family	0	0.0	1	0.4	0	0.0	1	0.4
Is it necessary to build up the cooperatives?	● necessary	43	93.5	407	89.7	53	88.3	503	89.8
	● Not necessary	3	6.5	47	10.4	7	11.7	57	10.2
Do you and your family willing to dedicate	● Willing	43	93.5	382	84.1	51	85.0	476	85.0
	● Not willing	3	6.5	72	15.9	9	15.0	84	15.0

labors or not?									
What is your attitudes to the World Bank loan poverty reduction project?	● Very supportive	32	69.6	308	67.8	34	56.7	374	66.8
	● supportive	11	23.9	128	28.2	23	38.3	162	28.9
	● Indifferent	3	6.5	18	4.0	3	5.0	24	4.3
	● Opposition	0	0.0	0	0.0	0	0.0	0	0.0
	what is the reasons for opposition?								

The results of the surveys indicate:

(1) More than half of the surveyed people had not heard of the project. Most of them know a little about the project through village meetings.

(2) Most surveyed people accept the cooperatives. 89.% considered cooperative development was necessary. 85% were willing to increase labor force, 95.7% support the Project.

As well, it is indicated:

(1) Information disclosure of the project is not sufficient. It needs to be further strengthened during project implementation. Public participation needs to be improved to make the project widely known.

(2) Surveys show that the public praises highly on the significance and reliance of the cooperative. Most of them are willing to be involved in project implementation. Most of them support the project, which means that the project should be developed in form of Cooperatives. It will be helpful for Project implementation.

8.2.2 EIA surveys

Surveys were made in five Project Counties between January to March 2016. Interviews, questionnaires and workshops were organized to collection on existing industries, proposed industries and selection of project locations, as well as environmental problems in project areas. Surveys forms were handed out to collect villagers' requests and recommendations on project implementation and environmental aspect.



Public Participation in Du'an



Public Participation in Donglan



Public Participation in Bama



Public Participation in Leye

(1) Survey targets

Five counties were involved in the survey: Du'an, Donglan, Bama, Fengshan and Leye Counties. Ten villages were involved and 29 forms were fulfilled. Information of involved villagers are in the following Table 8.2-7.

Table 8.2-7 The information list of People in surveyed

<u>No.</u>	<u>Name</u>	<u>Gender</u>	<u>Age</u>	<u>Nationality</u>	<u>Occupation</u>	<u>Education statue</u>	<u>Living adress</u>
<u>1</u>	<u>Huang ruogen</u>	<u>M</u>	<u>56</u>	<u>Zhuang</u>	<u>farmer</u>	<u>High school</u>	<u>Wudong village, Gaoling township, Du an County</u>
<u>2</u>	<u>Tang Xiuyou</u>	<u>M</u>	<u>30</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Yuanli village, Bao an Towhshio, Du an County</u>
<u>3</u>	<u>Zhou Shengke</u>	<u>M</u>	<u>62</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Yuanli village, Bao an Towhshio, Du an County</u>
<u>4</u>	<u>Han Jian</u>	<u>M</u>	<u>40</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Banlao Vilage, Aidong Township, Donglan County</u>

<u>5</u>	<u>Ban Fengqun</u>	<u>F</u>	<u>46</u>	<u>Yao</u>	<u>farmer</u>	<u>Junior college</u>	<u>Cao wang shan Tea Co.ltd in Leye County</u>
<u>6</u>	<u>Meng Yongdi</u>	<u>M</u>	<u>30</u>	<u>Yao</u>	<u>farmer</u>	<u>Junior college</u>	<u>Nongxiong subvillage,Gengdong Village,Changle Township, Donglan County</u>
<u>7</u>	<u>Chen Yong</u>	<u>M</u>	<u>40</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Banlao Vilage,AidongTownship,Donglan County</u>
<u>8</u>	<u>Liu Zutang</u>	<u>M</u>	<u>60</u>	<u>Han</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Bana village,Xishan Township,Bama County</u>
<u>9</u>	<u>Huang Xiaolan</u>	<u>F</u>	<u>33</u>	<u>Zhuang</u>	<u>farmer</u>	<u>Junior college</u>	<u>Lashi Subvillage, Hele Village, XishanTownship, Bama County</u>
<u>10</u>	<u>Zou Nian si</u>	<u>M</u>	<u>39</u>	<u>Zhuang</u>		<u>Junior college</u>	<u>Shilin village, Tongle Township, Leye County</u>
<u>11</u>	<u>Liang Jiayi</u>	<u>M</u>	<u>62</u>	<u>Zhuang</u>	<u>entrepreneur</u>	<u>under graduate</u>	<u>Longqu Moutain Tea Factory in Leye County</u>
<u>12</u>	<u>Zhou Ganling</u>	<u>M</u>	<u>51</u>	<u>Zhuang</u>	<u>village director</u>	<u>High school</u>	<u>Dongwen Village, JiuhuaTownship, Leye County</u>
<u>13</u>	<u>Guan Yening</u>	<u>M</u>	<u>34</u>	<u>Han</u>		<u>Technical Secondary School</u>	<u>Xianong eco-food development Co.ltd in Leye County</u>
<u>14</u>	<u>Yang Chang lun</u>	<u>M</u>	<u>49</u>	<u>Han</u>	<u>principal</u>	<u>High school</u>	<u>Changlun Tea Co.ltd in Leye County</u>
<u>15</u>	<u>Lu Tingying</u>	<u>M</u>	<u>46</u>	<u>Zhuang</u>	<u>farmer</u>	<u>primary school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>
<u>16</u>	<u>luo Dong</u>	<u>M</u>	<u>59</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>

<u>17</u>	<u>Luo lisi</u>	<u>M</u>	<u>31</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>
<u>18</u>	<u>Luo Lijia</u>	<u>M</u>	<u>40</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>
<u>19</u>	<u>Huang Anling</u>	<u>M</u>	<u>37</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>
<u>20</u>	<u>Luo Cheng</u>	<u>M</u>	<u>42</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lewen Subvillage,Xinhua Township, Leye County</u>
<u>21</u>	<u>Zhou Huaxue</u>	<u>M</u>	<u>52</u>	<u>Han</u>	<u>Village cadre</u>	<u>junior middle school</u>	<u>Huaping Village,Huaping Township, Leye County</u>
<u>22</u>	<u>Chen Mingshe ng</u>	<u>M</u>	<u>38</u>	<u>Han</u>	<u>Village cadre</u>	<u>junior middle school</u>	<u>Huaping Village,Huaping Township, Leye County</u>
<u>23</u>	<u>Zhou Huayuan</u>	<u>M</u>	<u>37</u>	<u>Han</u>	<u>village director</u>	<u>Technical Secondary School</u>	<u>Huaping Village,Huaping Township, Leye County</u>
<u>24</u>	<u>Deng Xiangxin</u>	<u>M</u>	<u>48</u>	<u>Han</u>	<u>village party secretary</u>	<u>High school</u>	<u>Huaping Village,Huaping Township, Leye County</u>
<u>25</u>	<u>Chen Sheng dao</u>	<u>M</u>	<u>59</u>	<u>Zhuang</u>	<u>village director</u>	<u>junior middle school</u>	<u>Nalao Village,Changzhou Township,Fengshan County</u>
<u>26</u>	<u>Chen Lankun</u>	<u>M</u>	<u>59</u>	<u>Zhuang</u>	<u>farmer</u>	<u>junior middle school</u>	<u>Lela Subvillage,Nalao Village,Changzhou Township,Fengshan County</u>
<u>27</u>	<u>Zhang Yuan quan</u>	<u>M</u>	<u>58</u>	<u>Han</u>	<u>Village cadre</u>	<u>High school</u>	<u>Wenli Village,Qiaozhang Township,Fengshan County</u>
<u>28</u>	<u>Zhang</u>	<u>M</u>	<u>42</u>	<u>Han</u>	<u>Migrant</u>	<u>junior</u>	<u>NO. Subvillage,Qiaoyin</u>

	<u>Guangju</u>				<u>worker</u>	<u>middle school</u>	<u>Township,Fengshan County</u>
<u>29</u>	<u>Zhu</u> <u>Chao</u> <u>zhong</u>	<u>M</u>	<u>50</u>	<u>Han</u>	<u>farmer</u>	<u>High school</u>	<u>Wenli Village,Qiaozhang Township,Fengshan County</u>

(2) Survey Results

Table 8.2-8 The public opinion of project and the result of survey statistics

Survey contents	Answers	NNT	(%)
1. Have you known of World Bank loan Guangxi Poor Rural Poverty alleviation Pilot Projects?	Known	28	97
	Heard	1	3
	Don't know	0	0
2. How do you think of the local environment statue?	Good	28	97
	Not so good	1	3
	Worse	0	0
3. Do you think are there any main environmental problems in local?(multi-selected)	Air pollution	0	0
	Surface pollution	2	7
	underground pollution	0	0
	Soil pollution	0	0
	Noise pollution	0	0
	Ecological damage	2	7
	Don't know	0	0
4. Do you support the implementation of the Project?	Yes	115	97
	No	3	3

(1) Understanding of the Project

97% of the public knows the project, 3% heard of the project, which means project information has been disseminated effectively in the surveyed areas.

(2) Opinions on environment quality

97% of the public considered the local environmental quality was very good or good; 3% considered it average. Most of public are satisfied with the quality of local environment.

(3) Opinions on environmental problems

Statistical results indicate that villagers considered there are no problem in the local environment. Only 7% considered the surface water is polluted and ecological is damaged. The public

concerns more the surface water and ecological environment

(4) Attitude towards the Project

Survey results indicate that all surveyed targets support the Project. It was indicated in interview process, surveyed households hoped to enhance project development. Their attitude is positive.

(5) Do you have any requests or recommendations for the Project?

During interviews households filled out questionnaires and provided personal requests or recommendations on the project development: ① fasten project development ② build preliminary processing facilities (buildings and machinery) for farm product. ③ professional technical support and training are provided ④ build marketing platform.

(6) Do you have any requests or recommendations for environmental management of the Project?

Surveyed households also indicated their comments and requests on environmental management in project implementation and development: establishment of solid waste treatment facility (domestic waste, solid waste during industry development, animal waste, etc.), setting up biogas tanks for livestock or poultry farm; and strengthening of environmental management.

Surveys indicate there are no large-scale factories and industry polluting points in surroundings of the project villages. The main environmental problems include shortage of water resources, village being dominated by rocks, inconvenient communication, constrained industry development and limited cultivated land area.

Activity category and site selection should be decided according to land use conditions and local ecological environment, in particular, tourist development activities must take the extent of development and regional eco-environment into consideration. The proposed industries are basically in line with the local environment conditions. For example, Wenli village of Fengshan County, as a rocky mountain village, has selected Walnut as a supported industry. Nalao village of Fengshan County chose to maintain the original camellia forest (for camellia oil) and apply organic fertilizer. Wudong village of Du'an County adopted semi-stall feeding for goats and establishment of a "grassland" in the mountains. Cropping not only improves the living standards of farm households, but also is helpful for improvement of regional environment (rocky desertification).

8.3 Conclusions of Public Participation

SIA and EIA surveys indicate 95% of the public support the Project. No objection to the project implementation has been found, which shows the public holds positive views towards the Project. Most villagers and leaders consider that implementation of the Project will largely improve the production and living environment of the rural poor households and enhance industrial restructuring and development. The Project will enhance the development of the second and tertiary industry, largely increase employment, drive regional economic and lift the rural poor people out of poverty. All hope the project be commenced as soon as possible. The local communities highly support the Project.

8.4 Continuous Public Participation

Public participation is a continuous process which goes through from project design, implementation to operation. It should be open to the public and public plan shall be set up.

8.4.1 Preparations for Project Implementation

During project preparation, it is necessary to allow unlimited public participation and negotiation

with the main stakeholders. Opportunities must be provided for information disclosure and public participation, to increase effective participation of all stakeholders, especially the major stakeholders, improve their awareness and participation, ensure targeted groups and affected stakeholders are fully informed and involved in the project. Rights to know, participate, supervise, speak and make decisions must be secured to enhance project implementation and minimize social and environmental costs in implementation and operation of the Project.

On the other hand, households have little information and participation in project preparations. Therefore, it is necessary to develop a workplan to enhance households' understanding and participation in project design, as well as opportunities and approaches, rights and obligations for participation. Institutionalization of participation shall be made through program design. Make sure the Project benefits directly beneficiaries, in particular, participation of ethnic groups, poor households and women who are the vulnerable groups.

On 12 May 2016, provincial PMO publicized SIA and EIA Reports and the Environmental and Social Management Framework on Guangxi Poverty Alleviation website. <http://www.gxfpw.com/html/c7/2016-05/150020.htm>



广西外债扶贫项目管理中心
2016年5月6日

- [广西贫困片区农村扶贫试点项目社会评价报告](#)
 - [附件1. 移民安置计划框架](#)
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 - [广西贫困片区农村扶贫试点项目环境和社会管理框架_part5](#)
- (注意，以上五个文件全部下载后一起解压就可以得到文件《广西贫困片区农村扶贫试点项目环境和社会管理框架》，缺一不可)
- [附件1. 现行的环境和社会管理问题的审查表格](#)
 - [附件2. 通用的环境管理计划](#)
 - [附件3. 移民安置计划框架](#)
 - [附件4. 病虫害管理计划](#)
 - [附件5. 少数民族发展计划](#)

On 13 May 2016, provincial PMO publicized SIA and EIA Reports and the Environmental and Social Management Framework on Guangxi Daily's website is : http://gxcb.gxnews.com.cn/html/2016-05/13/content_1264771.htm, The following is a copy of Guangxi Daily.



2016年5月13日

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广西日报 2016-05-13

世界银行贷款“广西贫困片区农村扶贫试点示范项目”是中国政府与世界银行在广西壮族自洽区开展的大型综合性扶贫项目，2014年10月被列入国家发改委、财政部利用世界银行贷款2015 - 2017财年备选项目规划。根据《世界银行安全保障政策》《国家发展改革委重大固定资产投资项目社会稳定风险评估暂行办法》（发改投资〔2012〕2492号）和《环境影响评价公众参与暂行办法》（环发〔2006〕28号）有关要求，现将《世行贷款广西贫困片区农村扶贫试点示范项目社会评价报告》和《世行贷款广西贫困片区农村扶贫试点示范项目环境与社会管理框架》进行公示，公众可通过邮寄信函（以邮戳日期为准）或电子邮件方式，就报告有关内容提出意见或建议。发表意见的公众请注明发表日期、真实姓名和联系方式，以便根据需要及时反馈。

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联系电话和传真：0771-5313850，电子邮箱：5659649nn@163.com。

邮政编码：530021

广西外资扶贫项目管理中心

2016年5月12日

8.4.2 Participation through the Whole Project Implementation Processes

Project public participation runs through the whole process from preparation, implementation to operation, including main contents, participants and their roles, participatory methods and requirements.

8.4.3 Project M&E

M&E agencies: County PMO is the implementing agency of internal monitoring; an independent monitoring agency will be responsible for the third-party monitoring and evaluation.

Monitoring content and indicators: the specific contents and indicators are detailed in project operational manual.

M&E arrangement: mid-term review, post assessment, social impact monitoring, resettlement monitoring and environmental monitoring

Table 8.4-1 Action Plan for Public Participation

Project Stages	Participant Activities	Participant Methods	Participant Objects	Rules and Methods	Responsible Bodies	Results
Project Preparation Stage	Counselor Recruitment	Village Publicity	All villagers and village cadres	Put up the counselor recruitment notice in the villages; Publicize the results of the counselor recruitment in the villages	County project office	The villagers could be informed of the content and result of the counselor recruitment.
	Project Publicity Mobilization	Media Publicity	All villagers	Publicize the basic project situation of the villages in the city/ county/ area	Provincial project office, city/county/area project office	The villagers could be informed of the project information.
		Internet Publicity	All villagers	Publicize the project contents on the institution websites of the poverty alleviation.	City/county/area project office	The villagers could be informed of the project information.
		Village cadres meetings and the general assembly of villagers representatives	All villagers	The county project Office holds the meetings of village head or village secretary in cooperation with the township, and informs the basic project information.	The county project office, project township, village cadres	The villagers could be informed of the project information.
		Village	All villagers	Publicize the key contents in the	Village cadres	The villagers could be informed of the

		Publicity (notices, banners, and broadcast)		villages, with the publicity time no less than 2 weeks)		project information.
		Proposals Publicity	All villagers	Village cadres shall send to families after the reception of proposals	Village cadres	The villagers shall be informed of the project information.
Project Implement ation Stage	Supervision and Management	Supervising the counselors	All villagers	Villagers shall take part in the supervision of counselors in information publicity and mobilization, cooperative foundation, training, industrial development planning and the operation situation.	Village cadres, city/county/ area project office、	Evaluation of the counselors; Complaint situation of the counselors collected by the Village Committee and project office
		Supervision of the Project construction	All villagers, cooperatives	Supervision of the construction quality by the Villagers	The county project office, construction companies	he villagers could be informed of the construction situation
	Organization and Training	Cadres Training Publicity	Village cadre, counselors, villagers representatives	Basic Project Situation, Industrial development planning, project operation procedures, establishment of stock cooperative, the requirements of the donation by	The county project Office	Publicity cadres shall be informed the basic project situation, industrial development planning, project operation procedures; Publicity cadres shall be informed the mobilization methods and contents.

				cooperatives, infrastructure construction, and the village publicity and mobilization activities.		
		Villagers Publicity Mobilization Training	All villagers	Basic Project Situation; advantages and disadvantages of the operation procedures; industrial development planning, establishment of stock cooperative, the requirements of the donation by cooperatives, infrastructure construction, and the village publicity and mobilization activities.	Village cadres, counselors and villagers representatives	The villagers shall be informed the basic project contents, industrial development planning, and project operation procedures.
		Send out the publicity brochure	All villagers	Project Office shall send the brochures to all villagers by Village Committee.	The county project Office and village cadres,	The villagers shall be informed the basic project contents, industrial development planning, and project operation procedures.
	Construction Information Publicity	Put up the posters	All villagers, cooperatives	Construction personnel shall publicize the construction information once a month, and publicize the construction communicators and the contact	The county project office, and the construction companies	Villagers shall be informed of the construction situation

				information.		
		Villagers' meeting	All villagers, cooperatives	Villagers meeting shall be held once the construction problems are found, and submit after the collection.	The county project office, and the construction companies	The results of project construction complaints
	Construction Participation	Villagers volunteer to work	All villagers	Priority shall be given to the job-provision to the villagers in Infrastructure construction. 30% priority shall be given to women.	The county project office, and the construction companies	The situation of volunteer to work of villagers
	Cooperative Operation	Operation Situation Publicity	Cooperative members, all villagers	Cooperative operation and the capital condition shall be arranged and publicized quarterly.	Cooperative council, supervisory board and counselors	Villagers shall be informed of the cooperative operation situation (the sales price of agricultural produce, and income distribution); percentage of members who participate in cooperative activities.
	Environmental Protection Participation	Publicity of the construction situation of Environmental protection facilities	Cooperative members, all villagers	It should be noticed of the environmental protection measures during the construction by stages	The county project Office, counselors and village committee	Villagers shall be informed of the environmental protection measures during the construction and the environmental protection measures.

	Industrial and Cooperative training	agricultural and technological training of villagers	All villagers	According to the local development industrial, the expert training shall be organized. The ethnic minority and women shall be no less than 30%.	County project office, counselors and Village Committee	Investigation results of the training requirements; training plans; training photos; percentage of the impoverish members among those who have participated in the industrial training; percentage of women members among those who have participated in the industrial training
		Cooperative management training	Cooperative managers	The cooperative management shall be trained, and the cooperative members enjoy the equal opportunities to be trained	County project office, counselors and Village Committee	The number of cooperatives with the training experience of operation and management; the training record of the cooperative management personnel
		Send out the training brochures	All villagers	Send out the agricultural production and cultivation brochures to project areas villagers	County project office, counselors and Village Committee	The situation of the villagers' acquisition of training brochures
Project Operation Stage	Infrastructure maintenance	Appointment of maintenance personnel	All villagers	Dividing the maintenance personnel based on the influences of the infrastructure; the government shall employ the villagers to manage	County project office and Village Committee	The continuous management of the infrastructure

		Maintenance personnel training	Maintenance personnel	Infrastructure maintenance training shall be conducted to the maintenance personnel	County project office, Construction companies and Village Committee	The situation of the maintenance personnel training and textual information
		Maintenance expenditure management	Village Committee, Cooperatives and villagers	Implementation and supervisory system shall be formulated based on the expenditure management of infrastructure maintenance; supervision shall be conducted by the villagers	County project office and Village Committee	Expenditure management of infrastructure maintenance
	Complaints and Appeals	Clarification of the appeals procedures	villagers	Any discontent during the implementation and operation of the project shall be resorted to the complaints system. Detailed procedures are clarified in the Complaints and Appeals procedures.	Provincial project office, County project office and Village Committee	

9 Institutional Arrangement, Responsibility and Capacity Building

Set up a Leading Group and a Provincial Project Management Office (PPMO) at provincial level. PPMO is responsible for overall project environmental management.

9.1 Institutional Arrangement and Responsibilities

Ten County PMOs are responsible for implementation. Institutional arrangement for environmental management and responsibilities are indicated in the following table 9.1-1.

Table 9.1-1 Institutional arrangement for environmental management and responsibilities

Stage	Project stakeholders	Environmental responsibilities
1	Infrastructure category	
Design and preparation	Owners/PMO	1. Be responsible for handling specific design, supervision, construction, equipment and materials procurement. 2. Project bidding and approval work, EIA approval
	Design unit, EIA unit	Design units made the engineering survey and design, and the EIA unit made the preliminary environmental impact assessment
	EPA	To check it whether installed the pollution control facilities or not, whether the design reaches standards and so on.
	County Bureaus of Construction, Water Resources, and Transportation	To supervise and inspect whether the construction and engineering design is reasonable or not, and do the work of bidding and approval, project supervision, construction quality and construction safety
Construction period	Owners/PMO	1. Supervising <i>Environmental Management Plan</i> to implement the mitigation measures during construction period; 2. Carrying out the training propaganda of <i>Environmental Management Plan</i> mitigation measures during construction period.
	County Bureaus of Construction, Water Resources, and	Supervising all the measures during construction period, to ensure the implementation of civilized construction and production safety

	Transportation	
	Contractor, the construction team	Specific implementation of the <i>Environmental Management Plan</i> mitigation measures during construction period.
	Farmers/villages	Village committee actively cooperate to safeguard the legitimate rights and interests of the villagers, and to supervise the construction.
Operation period	Owners and operating units	<ol style="list-style-type: none"> 1. Specific implementation of the mitigation measures of <i>Environmental Management Plan</i> during operating period; 2. Making sure the operational phase environmental protection, construction progress, quality and safety 3. Be responsible for organizing related environmental monitoring 4. Be responsible for reporting the implementation to the superior PMO and the World Bank on a regular basis.
	Farmers, cooperatives and village collective	<ol style="list-style-type: none"> 1. Specific implementation of the mitigation measures of <i>Environmental Management Plan</i> during operating period; 2. Project supervision: protecting the environment, reducing consumables.
	EPA	Guiding and supervising the implementation of <i>Environmental Management Plan</i> mitigation measures
	Bureaus of Water Conservancy and Transportation / Roads	Guiding and supervising the implementation of <i>Environmental Management Plan</i> mitigation measures ...
2	Agricultural project activities	
Preliminary design stage	PMO	To make good project approval, train the propaganda backbones, advocate mobilizing the villagers, carry out the <i>Environmental Management Plan</i> and <i>Pest</i>

		<i>Management Plan</i> training.
	County Bureau of Agriculture and Animal Husbandry, and its affiliated Plant Protection Station	Agriculture and Animal Husbandry Bureau: To boot reasonable adjustment of agricultural industry structure, and the rational allocation of agricultural resources Plant Protection Station: testing soil and making formulated fertilization, monitoring pests and epidemic diseases and pests, providing local dynamic pest data, releasing timely the pests disease conditions, and conducting <i>Environmental Management Plan</i> and <i>Pest Management Plan</i> training.
	Veterinary Station	Carrying out technical promotion and training; also the <i>Pest Management Plan</i> training.
	Farmers	Applying for joining a cooperative and to recommend management personnel to take part in the project construction
	Cooperative	Establishing cooperatives or preparatory groups to settle project reporting and approving, designing good sewage facilities for the cooperative
	Village collectives	Organizing the advocacy and mobilization
	EIA unit	To make a scientific analysis whether this project impact environment or not, and make recommendations to optimize the project design!
Implement stage	PMO	<ol style="list-style-type: none"> 1. Regular inspection to the implementation of the measures of the project <i>Environmental Management Plan</i> and <i>Pest Management Plan</i>. 2. To carry out an <i>Environmental Management Plan</i> and <i>Pest Management Plan</i> training. 3. Be responsible for the organization of environmental monitoring 4. Be responsible for reporting the implementation to their superior PMO and the World Bank on a regular basis.

	County Bureau of Agriculture and Animal Husbandry, and its affiliated Plant Protection Station	<p>Plant Protection Station: guiding pest control, promoting pest control technology and guiding farmers to use organic fertilizer and low residue pesticide to promote pollution-free production. Monitoring local plant diseases and insect pests occurrence, and publish the development degree of the plant diseases and insect pests occurrence and trend prediction.</p> <p>Agriculture and Animal Husbandry Bureau: organizing production and introduction of the test seedlings, fertilizers, pesticides, veterinary drugs and other products, and also its demonstration and promotion; organizing and guiding quality monitoring and enforcement supervision and management to agricultural inputs, such as seeds, fertilizers, pesticides, veterinary drugs, etc.</p>
	Veterinary Station	Carrying out livestock prenatal, delivery and postnatal services, training and guiding village service personnel, technology demonstration households and large farmers. Monitoring the local livestock epidemic
	Farmers	Not to use prohibited pesticides, fertilizers; Properly handle garbage and take part in project implementation.
	Village collectives	To take part in project implementation, management, and periodical supervision of which production processes may impact environmental.
	Cooperatives/ processing units	<p>Implementing the project according to environmental requirements and controlling comprehensively the pollution in accordance with the relevant requirements of the sewage enterprises,</p> <p>Introducing new technologies, new varieties, and launching technical training, technical exchanges and advisory services,</p>
	County Environmental	<p>Carrying out environmental supervision and inspection;</p> <p>To organize and guide the project area environmental</p>

	Protection Agency	publicity and education, and popularize environmental science and knowledge of laws and regulations.
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9.2 Project Management Agencies

9.2.1 Organizational Structure

The Project Management Institutions at Regional, City, County, Township and Village levels are established at the requirements of project implementation and management. A leading group has been set up at regional level. The Foreign Capital Center is responsible for project implementation and management. The same structure is developed at county level, ie. a leading group and a PMO at county level. The County Poverty Alleviation office is responsible for the daily work and setting up a technical committee (advisory panel) to provide technical support. A Township Project Team (Station) is established at Township level. A Project Management Group is set up at village level and is responsible for implementation and management at village level. Figure 10 indicates the organizational structure of the Project.

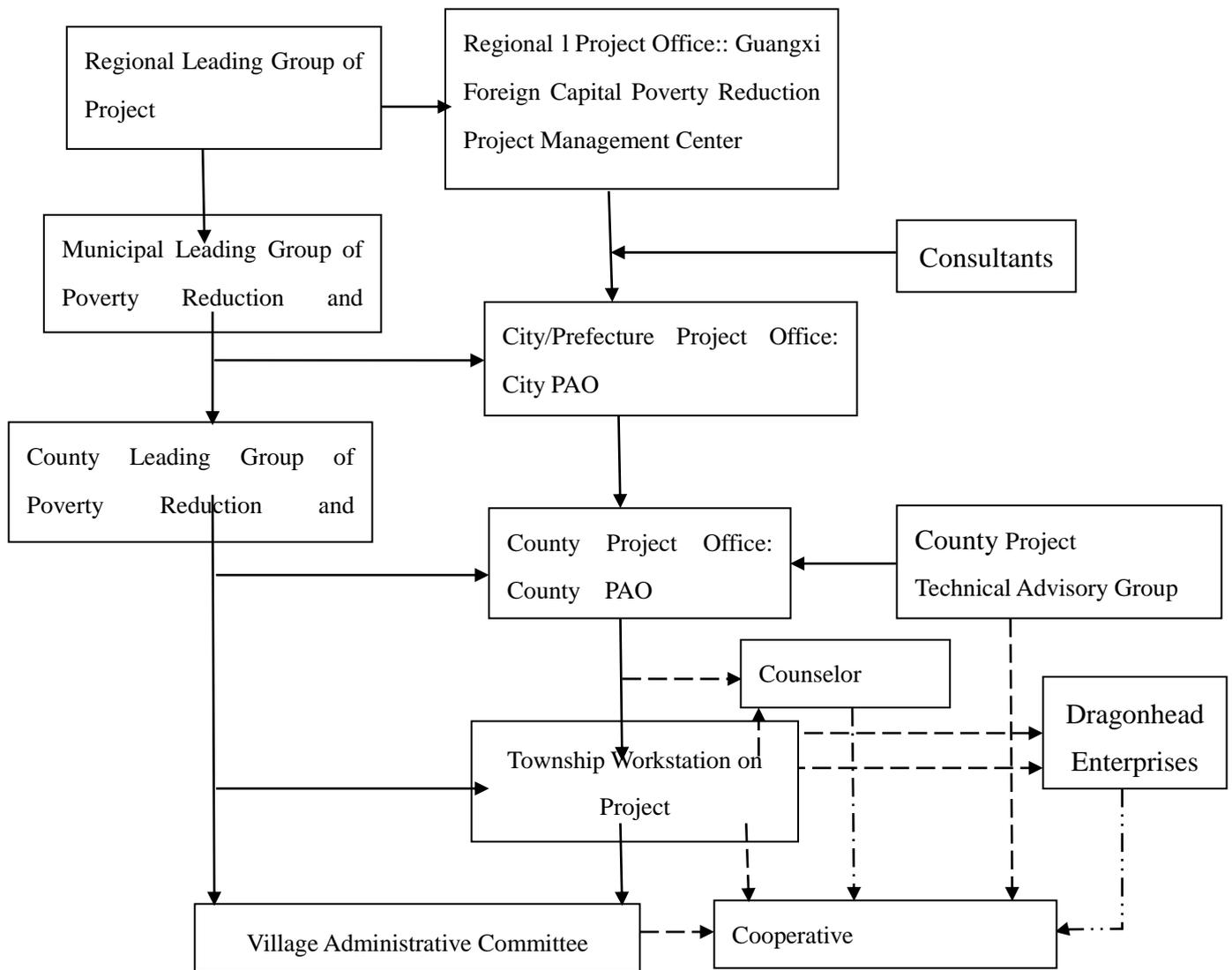


Figure 10 Project Organizational Structure

9.2.2 Roles and Responsibilities of Project Agencies at All Levels

(1) Regional leading group: leader is Vice Chairman of the Regional Government and members are leaders from Regional Poverty Alleviation Office, Development and Reform Committee and Financial Development. The leading group is responsible for major decisions of project policies and guidelines, reviewing and approving the overall project scheme and implementation plan, secure of counterpart funds, policies and strategic guidance.

(2) PPMO: the Regional (Provincial) PMO is set under the leading group within Guangxi Foreign Capital Poverty Alleviation Management Center. Regional PMO is Project Executive Agency and is responsible for project implementation

(3) City Leading Group comprises vice mayor as the leader and leaders of poverty alleviation office, development and reform committee and agricultural department at city level as members.

(4) City PMO is set up in City Poverty Alleviation Office.

(5) County Leading Group: County(city) leader as the group leader, main leaders of county poverty alleviation office, development and reform committee, financial and agricultural departments as members, and is responsible for counterpart funds, work expenditures, coordination and review of project implementation.

(6) County PMO: coordinated by director or deputy director of County (city) government office. County Poverty Alleviation Office is responsible for the daily work.

(7) County Technical (advisory panel) committee: comprised of leaders and specialists from financial institutions and relevant departments, responsible for selection of project area and industries, project planning, cooperative investment proposals justification, project guidance and technical training.

(8) Township PMO: set up at township level, equipped with adequate work staff.

(9) Administrative Village Management Group: built at village level, comprised of village leaders, director of women federation, village technicians, household representatives (by election) and supervising the project quality and progress.

(10) The Farmer Cooperative (FC): is a mutual aid organization developed at farmers will with democratic management, based on the family-contract-management system, comprised of producers of the same farm products or providers and consumers of similar farm services. It provides services to its members, and provides technology and information on procurement of production materials, marketing, processing, transportation, storage of farm products, and agricultural related business.

(11) FC instructors: provide assistance to county PMOs and the Cooperatives, but make no decisions.

9.3 Project Implementation and Management

9.3.1 Management Project Planning

PPMO develops Project Operational Manual and completion of Report on Feasibility Studies.

Project County selects appropriate industries and project areas with scientific proof; instructs project villages and the FCs to develop investment proposals and implementation plans for infrastructure and public services activities; in planning, organizes FC members and households to

learn information on basic conditions, restraints and farmers' will and needs of project villages; organizes relevant agencies, financial institutions and technical specialists to justify and guide the project selection, and provides feedbacks to project villages. The County PMO, after integrating cooperative investment proposals and infrastructure development plans, formulates project plans and submits to PPMO for approval.

9.3.2 Management of Project Plans

(1) Development and submission of annual plans: By the end of the year, FCs organize village meetings and develop plans for industrial and infrastructure activities of next year, with assistance and guidance from County, Township and Village PMOs. After reviewed by township level, the plans are submitted to county level and county level submits to provincial level. Guangxi Foreign Capital Center reviews and approves plans and returns them to project areas for implementation.

(2) Adjustment of Annual Plan Administrative Village Management Group or FC will identify adjustment for annual implementation plans by villager representatives' meetings or cooperative member meetings, which will be reported to County PMO for approval. When it is confirmed that adjustment must be made, the adjustment plan will be submitted from county project leading group or county PMO to Foreign Capital Center for approval.

9.3.3 Project Management and Monitoring

(1) Project Monitoring: including internal monitoring and external supervision, mainly on fulfillment of counterpart funds, investment plans, project quality, outputs, effects and impact.

1) Internal monitoring: administrative village management group (elected by villagers) monitors and supervises the whole project implementation. A publicity and complaint system shall be established. Notice boards will be set up in project villages. Information of the person who processes complaints shall be publicized to ensure the complaint channel is unimpeded. Management of project files shall be strengthened and files shall be kept at various levels to be looked up by the same level. Specialized persons shall be employed in County PMO, Project Village and FCs to receive, collect, integrate and maintain project files.

2) External supervision: including inspections, supervision, annual financial audits and media supervision by PPMO, city, county and township PMOs. Foreign Capital Center shall follow the PDO, the Bank's requirements and the requirements of the POM, and develop a monitoring indicator system, methods and procedures, and a system for monitoring to make sure results of monitoring is in compliance with actual status, and objective and fair.

(2) Project review and acceptance. Project review and acceptance follow the following specific procedure: self-inspection by the cooperative and self-acceptance by implementing agencies ---project owners apply for acceptance, Township Team conducts first inspection and submits County PMO for acceptance. County PMO organizes project acceptance team to review the project and rate and project period, quality and benefits against project plan and design. Project account, materials, funds and files shall be tidied up and finalized. A project completion report is required. Foreign Capital Center develops guidelines for project review and acceptance, and conducts randomly review and acceptance.

(3) Project evaluation evaluates project benefits and impacts after the project is completed. Project evaluation reviews project preparation, implementation, management, acceptance, follow-up management, participation, satisfaction and achievements, using participatory methods. A Project Evaluation Report is required.

(4) Follow-up management. After the completion and acceptance of a project, managers of

large-scaled infrastructure projects will be identified according to the nature of the project. The manager will be responsible for management of the project and ensure sustainability. The small-scaled community projects will be in charge by project management group elected by the community. The management group organizes discussions, and follows discussions to develop management system and village rules and regulations to make sure benefits are generated from the project. County financial and poverty alleviation departments organizes training for follow-up management persons. Development of FCs and assests created by FC support shall be managed by FCs in line with FC constitutions and resolutions from member assembly. County PMO supervises and manages FCs through Townshop Teams and FC instructors.

9.3.4 Environmental Management

(1) Roles and Responsibilites

Main responsibility of all relevant management institutions

① PMO

Regional, City and County PMOs should assist WB environmental department in environmental management of the Project;

② Environmental Protection Bureaus at City and County levels

They're responsible for the overall supervision and management of project processes against relevant laws and regulations. They conduct 'three-simultaneity ' project completion and acceptance

③ Environmental Supervision and Management

Assisting all sub-project owners or managers to supervise implementation of environmental protection measures at implementation site; and providing remedial measures for problems during implementation.

Developing detailed management plans in compliance with implementation plans. Review implementation against plans monthly and make modification if necessary. Responsible persons report to project leaders and monthly report results of environmental management inspection, and provide solutions to potential environmental problems identified in inspection.

④ Design and EIA Agencies

Develop environmental management plans and implementation scheme for environmental protection measures, and direct implementation of the environmental management plan.

(2) Environmental Management Contents

The project involves in many counties and cities and many sub-projects. Management contents and staff arrangements at different sub-project stages of environmental management are indicated in the below table 9.3-1. Personnel indicated in the table include staff of government agencies, contractor or consultant. For staff of government agencies, it should be their existing staff. For contractor and consultant, there is a project implementation plan but exact timing of hiring will be subject to implementation progress. The funding source is both the IBRD loan and counterpart funds.

Table 9.3-1 Environmental Management of Sub Projects at Various Stages

Stage	Related party of the Project	The key Environmental management responsibilities	personnel allocation
Design and preparation period	County PMO	In charge of connecting and coordinating with the environmental Protection Administration to implement environmental management issues.	2
	Owner	1. Responsible for project design, and preparation and such a series of environmental protection management work. 2. To carry out the environmental protection funds. 3. Responsible for the coordination with the government department in charge of environment to carry out the environmental management. 4. Recruit the supervision unit and collect records.	2
	Designing institutions	1.The environmental protection measures should be brought into the design plan and budget 2. Put the mitigation measures of the environmental management plan into the bidding document specification.	2
	Assessment institutions	1. Provide technical support for the engineering design of environmental protection work. 2.Compile the environmental impact assessment documents.	2
Construction period	Owner	1.Responsible for a series of environmental protection management during the construction, carry out the environmental protection work funds. 2. Carry out the management and supervision on the environmental protection work during the construction, do the investigation and handling the disturbance or pollution problems appeared in the process of construction. 3.Responsible for the coordination with the government department in charge of environment to carry out the environmental management. 4 track the implementation of environmental management plan, and regularly report to the competent department at the same level and the autonomous region PMO and the World Bank. 5.Accept and handle the public complaints.	2
	Contractor	1.Carry out the implementation of environmental protection measures during construction period according to the bidding documents, contracts and the environmental management plan. 2.Accept the guidance and supervision from project owner, environment supervision engineer and the related functional departments. 3.Accept the technical support from environmental consultancy. 4.Carry out safety protection measures, such as setting indication marks on construction site, and carrying on the fens for the construction site etc, to establish communication with the public, to ensure safety in construction. 5.carry out environmental management plan.	2
	Engineering/ environment supervision	1.To supervise the contractor to carry out environmental management plan and in performance of the environmental mitigation measures dressed in the contract. 2.On-site supervision of the implementation of the contractor. 3. Cooperate with construction unit in environmental management. 4.To keep a record and report of the environmental management plan implementation, then regularly report to the owner.	3
	County Bureau of Agriculture and Animal	1.Monitoring the local plant diseases and insect pests occurrence, and publish the development degree of the plant diseases and insect pests occurrence and trend prediction. MonitorIng the information on	2

Stage	Related party of the Project	The key Environmental management responsibilities	personnel allocation
	Husbandry	the procurement, distribution, and safe use of pesticide. 2. Monitoring the local livestock epidemic disease occurrence, and release of livestock epidemic disease development situation and trend prediction. Monitoring the information on the procurement, distribution and the safe use of vaccine.	
	Loacal environmental Protection Administration	1. Carry out the supervision and inspection on environmental protection measures from the owners and construction units. 2. Receive the report on implementation of the environmental management plan which submitted by the owner and PMO and then carry out administrative management according to the report. 3.If it occurred abnormal environment situation in the construction, carry out the emergency measures. 4. Accept public complaints, coordinate and deal with.	1
	TA/Consultant	1.Provide the technical support for environmental protection work during construction, according to the project owner's entrust, and the design research of environmental protection and environmental impact report. 2.Provide the technical guidance on environmental protection work for the contractor, and do the training work of environmental protection during construction period.	unlimited
Operation period	Operation Institutions	1.Responsible for the management of environmental protection after the operation and the implementation and monitoring of mitigation measures addressed in the environmental management plan during the operation period. 2.Responsible for contacting and coordinating with government supervision departments to carry out environmental management work. 3. Environment accident emergency treatment; 4.To do the regular staff training, in order to improve their ability, at the same time carry out environmental protection technology and experience exchange activities actively, to further improve the environmental management work.	2
	County Bureau of Agriculture and Animal Husbandry	1.Monitoring the local plant diseases and insect pests occurrence, and publish the development degree of the plant diseases and insect pests occurrence and trend prediction. MonitorIng the information on the procurement, distribution, and safe use of pesticide. 2.Monitoring the local livestock epidemic disease occurrence, and release of livestock epidemic disease development situation and trend prediction. Monitoring the information on the procurement, distribution and the safe use of vaccine.	2
	Local environmental Protection Administration	1.To do the environmental protection engineering acceptance 2.To do the manage and supervision of the environmental protection standard during the operational phase. 3.To do the supervision and inspection on the operation of completed environmental protection facilities.	2
	Civil public or NGOs	Social monitoring	unlimited

(3) Environmental Management Training

All county PMOs should strengthen environmental protection training during project implementation by providing training for project owners, implementing agencies, supervision engineers, PMOs and environmental management personnel. Capacity building in environmental management shall be strengthened to make sure implementation processes are in line with laws and regulations. Training plans are in the following Table 9.3-2.

Table 9.3-2 Environmental Protection Training at Various Stages

Stage	Training objects	Training contents	Number of participants	Duration (days)
Preparation period	County PMO	Selection and location of the sub projects.	2	2
Design period	County PMO	It would be considered of project industrial advantage, regional environmental constraints, the social economic and environmental should be coordinated developed.	2	2
Before Construction period	County PMO, Owner, Environmental Protection personnel	Environmental assessment and social management framework of the project: 1.The main role in the process of project implementation. 2.Policy and regulations. 3.The relevant environmental protection measures and requirements.(genetic environmental management plan). 4. The selection of projects and detailed rules for the implementation and requirements. 5.sustainable public participation and the implementation of the complaint. 6. Resettlement policy framework, pest management plans, ethnic minority development plan.	several	2
	Civil public or NGOs	Public participation, complaint mechanism.	several	1
Construction period	County PMO, Owner, Environmental Protection personnel	The environmental protection measures during the construction, as well as the environmental protection facilities operation and maintenance,environmental protection regulations on construction, planning, supervision, occupational health, health and notice, safety emergency measures and the environmental risk emergency measures.	several	2
	Contractor	1.The simple method and measure to monitor and control construction noise (self-test). 2. The measures and requirements related to environmental management plan. 3.The environmental protection regulations on construction and planning,occupational health, health and notice, safety emergency measures.	2 each in construction section	1
	Engineering/environment supervision	1.The air environmental monitoring and control technology, noise monitoring and control technology. 2. The environmental management plan during the construction, as well as the environmental protection facilities operation and maintenance. 3. The World Bank project management procedures, and reporting mechanism. 4. The monitoring standard, test, method, sample transport, data quality control, equipment used, etc 5.The environmental risk emergency measures, etc.	1~2 each in construction section	1

Stage	Training objects	Training contents	Number of participants	Duration (days)
		6.The occupational health, health and safety.		
	Civil public or NGOs	Public participation, complaint mechanism.	several	1
Operation period	County PMO	Environmental protection laws and regulations, environmental management, occupational health, health and safety emergency measures and notice, the environmental risk emergency measures.	2	2
	Owner, Environmental Protection personnel	1.The environmental protection measures in operational phase. 2.The regular supervision training related to the project. 3.Pest control management; 4. Environmental risk emergency.	1~2 each in sub-projects	2
	Engineering/environment supervision	1.The air environmental monitoring and control technology, noise monitoring and control technology. 2. The environmental management plan during the construction, as well as the environmental protection facilities operation and maintenance. 3. The World Bank project management procedures, and reporting mechanism. 4. The monitoring standard, test, method, sample transport, data quality control, equipment used, etc 5.The environmental risk emergency measures, etc. 6.The occupational health, health and safety.	1~2 each in project areas	2
	Civil public or NGOs	Public participation, complaint mechanism.	several	1

9.4 Capacity Building

PMO-----Provincial (Regional) Project Management Office (PPMO) is set within Guangxi Foreign Capital Poverty Alleviation Management Center. PPMO has sufficient management experience and competences in implementation of World Bank's safeguard policies as it has implemented two large World Bank supported poverty alleviation projects. It is necessary to strengthen its competences and maintain a stable number of staff. And project management and training on implementation of Bank's safeguard policies shall be strengthened.

Sub-project owners-----are FCs, households and County and Township government. Together with County PMOs, PPMO shall provide training on the Environmental and Social Management Framework and the attachments of the Environmental and Social Action Plan for sub project owners at various stages, ie. preparation, design and implementation stages. Training program is indicated in the following Table 9.4-1.

Table 9.4-1 The capacity training schedule of sub-projects in stages

Stage	Training objects	Training contents	Number of participants	Duration (days)
Preparation period	Cooperative, Household, Enterprises	1.The introduction of the main purpose of project implementation, object and so on. 2. The environmental and social issues should be pay attention to in the component selection.	2~4	1

Stage	Training objects	Training contents	Number of participants	Duration (days)
		3.The relationship between the components and the development of regional industry.		
Design period	Cooperative, Household, Enterprises	Project environmental and social management framework, mainly as follows: 1.What is the main role in the process of project implementation. 2. Policy & regulations. 3.The relevant environmental protection measures and requirements (Genetic environmental management plan). 4. The application of sub-project, study on the Attachment 1 Screening Form for Environmental & Social Safeguards Issues. 5.The selection of projects and implementing rules and requirements. 6.The sustainable public participation and the implementation of the complaint. 7.The function of Resettlement policy framework, plant diseases and pests management plan,and ethnic minority development plan.	2~4	2
Project implementation period	Cooperative, Household, Enterprises	How to use the environmental and social management framework of the project: 1.Attachment 2 the role of genetic environmental management plan play in the process of project implementation. 2. Sustainable public participation. 3. How to establish complaint mechanisms. 4. If the project involving resettlement should refer to the attachment 3 resettlement policy framework to implement. 5.The implementation of planting and breeding program should refer to the requirements and suggestions addressed in attachment 4 pests management plan. 6.The project implementation should fully consider of minority situation, study on how to use in implementation from attachment 5 ethnic minority development plan.	2~4	2

*The number of training participants means the numbers of every project's owners.

Annex 1 Safeguard Screening Form

Guangxi Rural Poverty Alleviation Pilot Project

Screening Form for Environmental & Social Safeguards Issues

Part 1 Screening Form

Note: Considering the poverty reduction nature of the project, the type and scale of anticipated sub-projects, and project area’s social and environmental features, the project was assigned Category B as result of the project concept stage safeguard review and has been agreed by the PMO, hence no potentially high risk subproject should be included. The applicable safeguard policies were also pre-determined as well.

This form is to be used by the Implementing Agency to screen potential environmental and social safeguards issues of a sub project, determine World Bank policies triggered and the instrument to be prepared for the sub project.

Subproject Name	
Subproject Location	
Subproject Proponent	
Subproject Type/Sector	
Estimated Investment	
Start/Completion Date	

Questions	Answer		If Yes WB Policy triggered	Documents requirement if Yes
	yes	no		
Are the subproject impacts likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented? Please provide brief description:			OP 4.01 Environmental Assessment Category A	It will not included in the scope of the project support.

Do the impacts affect an area broader than the sites or facilities subject to physical works and are the significant adverse environmental impacts irreversible? Please provide brief description:			OP 4.01 Environmental Assessment Category A	
Is the proposed project likely to have minimal or no adverse environmental impacts? Please provide brief justification:			OP 4.01 Environmental Assessment Category C	No action needed beyond screening
Is the project neither a Category A nor Category C as defined above? Please provide brief justification:			OP 4.01 Environmental Assessment Category B	Site-specific ESIA and/or ESMP
Are the project impacts likely to have significant adverse social impacts that are sensitive, diverse or unprecedented? Please provide brief description:			OP 4.01 Environmental Assessment Category A	It will not included in the scope of the project support.
Will the project adversely impact physical cultural resources? Please provide brief justification:			OP 4.11 Physical Cultural Resources	It will not included in the scope of the project support.
Will the project involve the conversion or degradation of non-critical natural habitats? Please provide brief justification:			OP 4.04 Natural Habitats	Addressed in ESIA
Will the project involve the significant conversion or degradation of critical natural habitats?			OP 4.04 Natural Habitats	It will not included in the scope of the project support.
Does the sub-project construct a new dam or rely on the performance of an existing dam or a dam under construction?			OP 4.37 Dam Safety	It will not included in the scope of the project support.
Does the project procure pesticides (either directly through the project, or indirectly through on-lending, co-financing, or government counterpart funding), or may affect pest management in a way that harm could be done, even though the project is not envisaged to procure pesticides?			OP4.09 Pest Management	Addressed in ESIA (Pest Management Plan)
Does the sub-project involve involuntary land acquisition, loss of assets or access to assets, or loss of income sources or means of livelihood? Please provide brief justification:			OP 4.12 Involuntary Resettlement	Resettlement Action Plan Framework

Are there any ethnic minority communities present in the sub project area and are likely to be affected by the proposed sub-project negatively or positively? Please provide brief justification:			OP 4.10 Indigenous People	Ethnic Minority Development Plan
Will the project have the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or aims to bring about changes in the management, protection or utilization of natural forests or plantations? Please provide brief justification:			OP4.36 Forestry	It will not included in the scope of the project support.
Will the project have the potential to have significant impacts or significant conversion or degradation of critical natural forests or other natural habitats?			OP4.36 Forestry	It will not included in the scope of the project support.
Is there any territorial dispute between two or more countries in the sub project and its ancillary aspects and related activities?			OP7.60 Projects in Disputed Areas	It will not included in the scope of the project support.
Will the sub project and its ancillary aspects and related activities, including detailed design and engineering studies, involve the use or potential pollution of, or be located in international waterways?			OP7.50 Projects on International Waterways	It will not included in the scope of the project support.

Conclusion and Safeguards Instruments Required:

The sub project is classified as a Category _____ project as per World Bank OP4.01, and the following safeguards instruments will be prepared:

1. _____
 2. _____
 3. _____
 4. _____
 5. _____
-

Note: Category C projects do not require a Environmental Management Plan and any Environmental protection measures to mitigate negative impacts .

Category B projects will apply a Generic Environmental Management Plan addressed in the ESMF, If needed, it will apply a supplementary EMP.

Category A projects will require Environmental and Social Impact Assessment (ESIA) and Environmental Management Plan, they will not included in the scope of the project support.

Part 2 Notes to Fill in the Screening Form

Sub project environment and social screening form is shown in above. This should be used henceforth for screening all the sub projects in the Project. This section should describe the screening process to determine:

- (i) the potential environment and social issues of a sub project;
- (ii) sub project environment category based on the environment and social issues;
- (iii) the sub project-specific action plan/s that has/have to be prepared as part of the sub project preparation but prior to its approval.

According to the results of the above screening form, to determine sub projects belong to Category A, B, or C, will respectively has the following three procedures:

- (i) Category C projects do not require Environmental management plan and any Environmental protection measures to mitigate negative impacts.
- (ii) Category B projects will apply a Generic Environmental Management Plan and Generic Pest Management Plan addressed in the ESMF, If needed, it will apply a supplementary EMP and PMP. If the sub projects refer to Land Acquisition and Resettlement, it requires to prepare the relevant documents base on the Immigrant Resettlement Policy Framework.
- (iii) Category A projects will not included in the scope of the project support.

Category A sub projects are those that have potential significant adverse environmental and social impacts that are :

- (i) sensitive (i.e., a potential impact is considered sensitive if it may be irreversible - e.g., lead to loss of a major natural habitat, or raise issues covered by OP 4.04, Natural Habitats; OP 4.36, Forests; OP 4.10, Indigenous Peoples; OP 4.11, Physical Cultural Resources; or OP 4.12, Involuntary Resettlement; or in the case of OP 4.09, when a project includes the manufacture, use, or disposal of environmentally significant quantities of pest control products);
- (ii) diverse, or unprecedented;
- (iii) affecting an area broader than the sites or facilities subject to physical works (e.g., a dam that may affect downstream and the nearby forestry and natural habitats.

Category A Screening Examples

How can a sub project affecting natural habitats be categorized as A?

The project is categorized as A if the screening indicates the potential for significant conversion or degradation of critical or other natural habitats. Significant conversion is the elimination or severe diminution of the integrity of a critical or other natural habitats caused by a major, long-term change in land use or water use. Significant conversion may include, for example, land clearing; replacement of natural vegetation; permanent flooding; drainage, dredging, filling, or channelization of wetlands; or surface mining. Conversion can result directly from the action of a project or through an indirect mechanism (e.g., through induced settlement along a road). Degradation is modification of a critical or other natural habitat that substantially reduces the habitat's ability to maintain viable population of native species.

How can a sub project affecting forests be categorized as A?

A project with the potential for significant conversion or degradation of natural forests is classified as Category A. Natural forests are forest lands and associated waterways where the ecosystem's biological communities are formed largely by native plant and animal species and where human activity has not essentially modified the area's primary ecological functions.

How can a sub project affecting physical cultural resources be categorized as A?

Physical Cultural Resources, as defined under OP 4.11, are movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, pale-ontological, historical, architectural, religious, aesthetic, or other cultural significance. A project that will likely have significant adverse impacts on PCR is categorized as A.

How can a sub project that triggers pest management policy be categorized as A?

Projects that include the manufacture, use, or disposal of environmentally significant quantities of pest control products are classified as Category A. Environmental significance takes into account the impacts, including benefits, on human health.

When is a sub project involving Involuntary Resettlement likely to be categorized as A?

The Bank does not provide specific categorization criteria relating to OP 4.12, Involuntary Resettlement. Generally, projects with significant resettlement-related impacts should be categorized as A. Application of judgment is necessary in assessing the potential significance of resettlement-related impacts, which vary in scope and scale from project to project. Projects that would require physical relocation of residents or businesses, as well as projects that would cause any individuals to lose more than 10 percent of their productive land area, often are categorized as A. Scale may also be a factor, even when the significance of impacts is relatively minor. Projects affecting whole communities or relatively large numbers of persons (for example, more than 1,000 in total) may warrant categorization as A, especially for projects in which implementation capacity is likely to be weak.

When is a sub project involving Indigenous Peoples likely to be categorized as A?

The Bank does not provide specific categorization criteria relating to OP 4.10, Indigenous Peoples. Though the policy applies whenever a group meeting the Bank's definition of Indigenous Peoples is present in the project area, categorization typically reflects the potential significance of any adverse impacts upon such groups. Projects that would require relocation of Indigenous Peoples, that would restrict their access to traditional lands or resources, or that would seek to impose changes to Indigenous Peoples' traditional institutions, are always likely to be categorized as A.

Category B sub projects are those sub projects that have potential adverse environment and social impacts that are less adverse, site-specific; and few if any of the impacts are irreversible.

Category C sub projects are those sub projects that have minimal or no adverse environmental and social impacts.

Annex 2 Generic Environmental Management Plan

1. Environmental Management Plan of Planting Sub projects

Phases	Main activities	Impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Design phase	Location and layout	Ecological impact, the impact on the sensitive area	Alternative comparison, it is in order to avoid potential negative impacts of construction and operation. The project's location should be avoided in nature reserves, scenic spots, the world cultural and natural heritage sites, drinking water sources reserve, basic grassland, forest park, geological parks, important wetland, natural forests, rare and endangered species of wild fauna and flora natural concentrated distribution area, key soil erosion prevention and control area, eutrophication water area, cultural relics protection units and significant history, culture, science, national protected area. Environmental protection facilities and engineering facilities should be designed at the same time, and the cost of environmental protection measures is required to be included in the project investment estimation. The choice of plant varieties should be native species.	FSR Consultant	EIA Consultant, FSR approval agency, PMO	FSR approval agency, PMO
Operation phase	Soil preparation, planting, management, fertilization, harvest	Soil properties change	In the process of land consolidation, surface soil should be retained and sorting as magnetism after reclamation.	Project contractor	PMO	Local Water Conservancy bureau
		Water and soil erosion	<ol style="list-style-type: none"> 1. Strengthening the management on construction, to avoid large area excavation, effective use of the existing topography for planting. 2. Avoid to do the land consolidation in raining season. 3. To do the planting activities in slope land, should adjust measures to local conditions to conserve soil and water, such as step and trench planting. 4. Don't undermine the original natural drainage system as far as possible, if land consolidation or planting activities affect the original drainage system, it is needed to improve the drainage system to avoid soil erosion. 5. In the condition of facilitating labor and security, try to reduce the width of construction road. 6. It is better to choose the planting sites as the existing farming land, if it is needed to change the types of crop, the land use types should be consistent with existing types, such as paddy field to retain for paddy field, dry land to keep for the dry land. 			

Phases	Main activities	Impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Operation phase			7.The New developed land should comply with the local land planning, please don't change the land use arbitrarily.			
	Soil preparation, planting, management, fertilization, harvest	Soil nutrient management	1.Cover the branches and leaves of crops in place to reduce the exposed surface, reduce the loss of soil nutrients to maintain soil fertility and moisture. 2.Use the scientific soil testing and formula, encourage the application of organic manure,and high efficiencyorganic fertilizer to increase the proportion of organic fertilizer and green manure in use. 3.Strictly prohibit applying fertilizer in the surface of soil, use the method of apply fertilizer in groove or pit, mulch soil, and cover a withered plant grass.	Project contractor	PMO	Local Agricultural department
		Solid waste pollution	1.The waste plastic bags, fertilizer bags, pesticide bottle, plastic, and etc which produced from farming activities, cannot be abandoned in the field, it requires unified collection and classification and unified piled up to the nearest garbage dumps in villages, and then re-pass to waste transfer station in towns, finally into the county comprehensive landfill landfill disposal. 2.The virgin camellia oil residue shoule be put back into the field after compost.			
		Irrigation management	1.To construct small water storage facilities, saving water for irrigation. 2.Regular maintenance of irrigation systems, channels and other infrastructure. 3. Reduce the leakage loss of irrigation system.			
		Water pollution control	1.Regular cleaning of the drainage channels, to avoid sedimentation jam. 2.Avoid to apply fertilizer and spray pesticide in the rainy season, reduce pollutants into surface water.	Project contractor	PMO	Local Environmental Protection bureau
		Pest management	Reduce the use amount of pesticide, when it is needed to use the pesticide for plants' diseases, choose the high efficiency pesticide with low residue.It is forbidden to use the high toxic pesticide in long residual period, and give preference to use chemical-free pesticide, which is mentioned in pest management plan.	Project contractor	PMO	Local Agricultural department
Operation phase	Soil preparation,	Waste and greenhouse	1.Open burning is prohibited after weeding, harvesting and land consolidation. 2.It is prohibited to burn waste plastic bags, fertilizer bags, pesticide bottle,	Project contractor	PMO	Local Agricultural

Phases	Main activities	Impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
	planting, management, fertilization, harvest	gas emissions Serendipitous cultural relic	pesticide packaging and plastic, etc. If discover cultural relics, must stop construction, protect the scene, timely inform the local department for cultural relics protection, the re-excavation work shall not be done till the end of cultural relics identification and protection.	Project contractor	Local cultural relics competent department	department

1.1 Environmental Management Plan of Planting Sub-projects in Stony Desertification Areas

Phases	Main activities	Impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Operation phase	Soil preparation, planting, management	Water and soil erosion	1.Choose the plant nursery in flat, leeward sunning dale and good drainage plots.Soil preparation is better to do in autumn and winter season, deep ploughing,loosening and flatting the soil for the spring sowing. While growing seedlings should choose thick and fertile soil. 2.At the time of soil preparation for curing planting area, sufficient base fertilizer is needed to retain the original vegetation and topsoil as much as possible. Far better to make sure seedlings is erected and root is flared when transplanting, the depth of the planting can exceeded the original seedling, but the graft union should be above outside, treading down and irrigation.	Project contractor	PMO	Agricultural department
		Vegetation finishing and cutting	1.For perennial crops, such as walnut, tea, camellia, mango, orange, kiwi, etc, while pruning according to site conditions. 2.Where each main branches remain 3 lateral branches in poor soil, if the site conditions are good, then again select and remain 1-2 lateral branches, it is best to keep the balance of the tree's growth.Remove redundant thin bearing basal shoot while it is too much, to enhance ventilation devious to light. For bamboo,and mulberry leaf, it should have planned cutting instead of clear cutting in harvest time. 3.To minimize the weeds removed, in order to protect the growth of understorey vegetation, reduce the rocky desertification in maximum extent, as long as the weeds do not affect the growth of crops. 4.In addition to the main crops as bamboo,Zenia insigins Chun,Chinese toon tree, honeysuckle and other tree species can be grew in stony desertification mountain, they will accelerate vegetation restoration effectively in the rocky mountain . 5.According to the local natural conditions, the scale of planting can be developed			

Phases	Main activities	Impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Operation phase			in the mid and bottom part of the karst rock mountainous, depressions, valley, and those forestry land, woodland and farmland which water and soil loss is relatively light and the slope and site conditions is quiet good. It can focus on developing new varieties, such as broussonetia, mulberry, honeysuckle, vitis amurensis. Artificial afforestation in rocky mountain can choose the species like dendrocalamus minor, Zenia insignis Chun, vitis amurensis, dal, Acrocarpus fraxinifolius, dalbergiae, Cornus wilsoniana, ect.			
	Soil preparation, planting, management	Fertilization and Contamination of pesticide	Applying fertilizers in the strip furrow around the tree trunks and crowns , can effectively reduce fertilizer loss. The prevention of pests should base on the principle of “focusing on the prevention, treated comprehensively”.It should pay attention on the physical prevention measures in dealing with pests priority using biological pesticide and low toxicity pesticide, as shown in the pest management plan.			

2. Environmental Management Plan of Livestock Breeding Sub-Projects

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Design phase	The location and layout of feasibility study		Alternative comparison, it is in order to avoid potential negative impacts of construction and operation. The project's location should be avoided in nature reserves, scenic spots, the world cultural and natural heritage sites, drinking water sources reserve, basic grassland, forest park, geological parks, important wetland, natural forests, rare and endangered species of wild fauna and flora natural concentrated distribution area, key soil erosion prevention and control area, eutrophication water area, cultural relics protection units and significant history, culture, science, national protected area. Environmental protection facilities and engineering facilities should be designed at the same time, and the cost of environmental protection measures is required to be included in the project investment estimation.	FSR Consultant	EIA Consultancy, FSR approval agency , PMO	FSR approval agency, PMO
Construction phase	Nursing house Construction	Water pollution	1.It should strictly manage in saving water, and reduce construction waste water discharge. 2. Construction waste shall not be dumped into the nearby river.	Project contractor	PMO Local Environmental Protection bureau	Environmental Supervision

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Construction phase	Nursing house Construction	Air pollution	Watering regular on the bare surface within the construction site, keep soil moisture, and reduce the dust on surface; Waste soil should be given on the spot, if it is useless, it should be cleaned up and transported away without delay, and the fence or wind deflector which covered the powder material in its surroundings should be set up temporary, in order to prevent dust diffusion.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
		Solid waste pollution	It is forbidden to dump the construction solid waste to the nearby rivers or any other rivers in China.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
		Serendipitous cultural relic	If discover cultural relics, must stop construction, protect the scene, timely inform the local department for cultural relics protection, the re-excavation work shall not be done till the end of cultural relics identification and protection.		Local cultural relics competent department	
		Noise pollution	It should be choose the low noise equipment for construction; While Vehicle transportation at night, should be no honking.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
		Water and soil erosion	1.It is reasonable to arrange the construction time, as far as possible to avoid the storm season to do a large scale excavation and backfill of earthwork, to avoid the erosion and destruction on the surface of soil. 2. Temporary covers of land should be timely recovered. 3. When put the pile temporary, please stack surface soil in the middle of the site, and stack the stone pile up in the surrounding, in order to prevent the soil erosion.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
Operation phase	Breeding Activities	Water pollution	1.The waste water collected from washed water, sewage and animal urine in the animal breeding nursery, would be discharged into biogas pool or sewage treatment facility for treatment, and then discharge into the planting fields.	Project contractor	PMO Local Environmental Protection	Local Environmental Protection bureau, Environmental Supervision

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
			<p>2.It is not allowed to discharge sewage into surface water without waste treatment.</p> <p>3.It should strictly manage the nursing house,temporary junk stacking facilities, cesspool and pipeline for sewage and strictly beware of the leakage which might cause the pollution of land, surface water and groundwater.</p>		bureau	Environmental Supervision
	Breeding Activities	Air, odor pollution	<p>1.Breeding sites, composting sites should choose under the wind of the residential area and keep a certain distance with the residential area.</p> <p>2.It should enhance the management to the odor pollution by timely cleaning dung and sewage of animals, and periodically cleaning animal sheds to reduce the exposed time of faeces and urine and putrid fodder, to prevent the solid dropping.</p> <p>3. It should be set a device against the rain and scattering for the temporary solid waste site, build a faeces and urine collection storage device, composting products should be buried in time during use.</p> <p>4.It is ensured ventilation in animal nursing house, and sprayed deodorant regularly. At the same time to strengthen the management of animal nursing house, use strip type seam floor completely or partly, to ensure the cooling of excrement and urine, then clean out the faeces as soon as possible, strengthen the ventilation in the circle to accelerate the feces drying, it can reduce the odor produced;</p> <p>5. It should keep the livestock body clean;</p> <p>6.By the application of the block and absorption of plants, it would greatly reduce the stink.</p>	Project contractor	PMO	Local Environmental Protection bureau,Environmental Supervision
	Breeding Activities	Solid waste pollution	<p>1. The livestock manure, renewal and biogas slurry can be treated as fertilizer after rotten into fields as far as possible, it is banned to be discarded or storage.</p> <p>2. It is required to recycle and disposal the animal bodies handled by specialized agencies, if there is not such type of organization, it is needed to dig a deep hole to bury , discarded or storage is prohibited.</p>	Project contractor	PMO, Animal Husbandry Bureau	Local Environmental Protection bureau,Environmental Supervision
	Use of veterinary drug	Epidemic diseases	<p>1. The selection of site should be facilitate for isolation of disease and the function divided should be scientific and reasonable.</p> <p>2.To promote the animal husbandry in scale, intensively and standardized. Fully considering the scale apply to the environmental carrying capacity to avoid disease risk, advocate healthy breeding way.</p>	Project contractor	PMO, Animal Husbandry Bureau	Agricultural Bureau

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
			<p>3. Control the flow of personnel and items. Mainly includes the fauna, sanitation and pathogens control, etc.</p> <p>4, establish and perfect the system of epidemic prevention. Mainly including health disinfection system, immune system, medical system, and death of livestock and poultry and pollutant disposal system, insecticidal and deratization system and epidemic reporting system, etc.</p> <p>5. Follow the procedures to immune to epidemic diseases such as avian influenza, foot-and-mouth and etc. Complete the record of Immunizations, carry out immune effect monitoring regularly.</p> <p>6. Establish regular disinfection system, select the appropriate disinfection drugs of broad spectrum, high efficiency, low toxicity to disinfect.</p> <p>7. Animals with avian influenza and foot-and-mouth disease, should be killed instead of cured. For acute parasitic diseases and bacterial infectious diseases can use antibiotics or chemical drug treatment. Addressed in the pest management plan.</p>	Project contractor	PMO, Animal Husbandry Bureau	Agricultural Bureau

2.1 Environmental Management Plan of Livestock Breeding Sub-Projects in Stony Desertification Areas

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Preparation phase	Nursing house Construction	Water and soil erosion	It is banned to build nursing house in rocky desertification areas and to fetch gravel soil, cut trees, etc.	Project contractor	PMO	Agricultural department
Breeding phase	Breeding	Destruction of vegetation in rocky areas	<p>It is forbidden to graze sheep, cattle, chickens, pigs on the stone mountain, to avoid the animals eat the roots and leaves which will exacerbate water loss, soil erosion and aggravate the degree of rocky desertification.</p> <p>Rear the livestock in captivity, develop the forage grass production, increase forage grass supply, maintain the relative balance of supply and demand, in order to reduce the livestock carrying pressure of natural grassland.</p>			

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
	Animal manure treatment	Ambient contaminate	Build the biogas tank to dispose the livestock manure, use the biogas to lighting, cooking dishes, use the biogas water for irrigation of fruit trees, use biogas residue to fertilize fields and feed the fish. Reduce the demand for cutting vegetation in stone mountain to slow down the degree of rocky desertification.	Project contractor	PMO	Agricultural department

3. Environmental Management Plan of Infrastructural Sub projects of Construction Roads, Water Tank, Water Diversion Facilities

Phases	Main activities	Negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Design phase	The location and layout of feasibility study		Alternative comparison, it is in order to avoid potential negative impacts of construction and operation. The project's location should be avoided in nature reserves, scenic spots, the world cultural and natural heritage sites, drinking water sources reserve, basic grassland, forest park, geological parks, important wetland, natural forests, rare and endangered species of wild fauna and flora natural concentrated distribution area, key soil erosion prevention and control area, eutrophication water area, cultural relics protection units and significant history, culture, science, national protected area. Environmental protection facilities and engineering facilities should be designed at the same time, and the cost of environmental protection measures is required to be included in the project investment estimation.	FSR Consultant	EIA Consultant, FSR approval agency, PMO	FSR approval agency, PMO
Construction phase	Construction water and household waste water	Water pollution	1. It should strictly manage in saving water, and reduce the construction waste water discharge; 2. Personnel waste water shall not be dumped randomly, to be treated relying on the nearest living facilities. 3. construction waste shall not be dumped into the nearby river; 4. Do the daily maintenance of the machinery, to avoid the phenomenon of run, drip and leakage. In addition, to cover all the machines in the rain the rainy.	Project contractor	PMO, Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Excavations and fillings	Air pollution	1. Strengthen on the management and civilized construction, discharge the building materials lightly, it should cover tarpaulin while the vehicles are transporting the materials such as lime, ballast, cement which will generate dust. 2. It can be prevented from raised dust to do watering and cleaning on the construction sites and construction roads. 3. The transportation of building materials and waste soil shall comply with the	Project contractor	PMO, Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision

Phases	Main activities	Negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
			local relevant traffic regulations (such as bagging, covering or airtight transportation), at the time of shipment is not allowed overload and the soil sprinkling . 4. The concrete mixer should be located in the shed which should be located away from the densely populated areas such as the residents and schools. There would be a spraying and dust reducing measures while stirring to reduce dust emission.			
	Earthworks, waste soil transport and disposal, and solid waste generation	Solid waste pollution	1. It is needed to make a waste disposal and transportation plan to avoid overload transportation which will cause dropping of solid waste. 2. It should be classified and centralized storage of the abandoned building materials, and it is suggested to recycle by the collectors for the recyclable materials, and convey the unrecyclable materials to the specified construction waste dumps. It is banned to treat mixed with household waste and discard casually. 3 It is suggested that the generated construction waste to be backfilled on the spot as far as possible, residual waste to be transported to other local construction sites, or sent to the designated place to pile up according to the requirements of local environmental protection department. It is resolutely banned to dump the waste into the nearby river and other rivers in China, pickup to relevant departments for bio-safety disposal and utilization timely and orderly.	Project contractor	PMO, Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	construction and excavation	Serendipitous cultural relic	If discover cultural relics, must stop construction, protect the scene, timely inform the local department for cultural relics protection, the re-excavation work shall not be done till the end of cultural relics identification and protection.		Local cultural relics competent department	
	Construction and transportation vehicles	Noise pollution	1. It should be choose the low noise equipment for construction. While Vehicle transportation at night, should be no honking. 2. It is need to take effective noise reduction and vibration reduction measures in construction, such as elastic cushion, cladding, acoustic shield, etc.	Project contractor	PMO, Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	construction sites and surface soil	Water and soil erosion	1.It is reasonable to arrange the construction time, as far as possible to avoid the storm season to do a large scale excavation and backfill of earthwork, to avoid the rain on the surface of soil erosion and destruction;	Project contractor	PMO, Local Environmental	Local Environmental Protection

Phases	Main activities	Negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
	vegetation elimination		2. Temporary covers of land should be timely recovery; 3. When put the pile temporary, please stack surface soil in the middle of the site, and stack the stone pile up in the surrounding, in order to protect the soil erosion.		Protection bureau	bureau, Environmental Supervision
Operation phase	Transportation	Air pollution	1.It is require to cover canvas on transportation vehicle. 2. It is needed to clean the vehicles in time to avoid dust on the road; 3. It can grow green plants on both sides of roads to reduce the influence of the air environment.	Project contractor	PMO	Local Environmental Protection bureau, Environmental Supervision
	Transportation	Noise pollution	It is needed to have a vehicles' speed limit, afforesting the both sides on roads, in order to reduce the impact on the environment.	Project contractor	PMO	Local Environmental Protection bureau, Environmental Supervision

3.1 Environmental Management Plan of Infrastructural Sub projects of Construction Roads, Water Tank, Water Diversion Facilities in Stony Desertification Areas

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Preparation phase	Civil work	Water and soil erosion	1.To build the roads should use of the existing road as far as possible, if needed to build new roads, it is better to minimize the width and length under the premise of convenient and safety for access. 2.It is banned to build roads in rocky desertification areas and to fetch gravel soil, cut trees,etc. 3.It should be closed management in the stone mountain of rocky desertification area. 4.Take active water engineering measures on block, storage, production, irrigation and diversion to reduce water and soil erosion, conservation of the soil.	Project contractor	PMO	Water conservancy, Environmental Protection bureau

4. Environmental Management Plan of Storage and Warehouse Sub projects

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Design phase	The location and layout of feasibility study		<p>1. Alternative comparison, it is in order to avoid potential negative impacts of construction and operation. The project's location should be avoided in nature reserves, scenic spots, the world cultural and natural heritage sites, drinking water sources reserve, basic grassland, forest park, geological parks, important wetland, natural forests, rare and endangered species of wild fauna and flora natural concentrated distribution area, key soil erosion prevention and control area, eutrophication water area, cultural relics protection units and significant history, culture, science, national protected area. Environmental protection facilities and engineering facilities should be designed at the same time, and the cost of environmental protection measures is required to be included in the project investment estimation.</p> <p>2. If the location is selected in the industrial zone, it must be set in legal formalities and with the complete environmental protection formalities.</p> <p>3. The independent location should conform to the requirements of the local city planning of land use.</p>	FSR Consultant	EIA Consultant, FSR approval agency, PMO	FSR approval agency, PMO
Construction phase	Construction water and household waste water	Water pollution	<p>1. It should be strictly managed in saving water, and reduce the construction waste water discharge;</p> <p>2. Personnel waste water shall not be dumped randomly, to be treated relying on the nearest living facilities.</p> <p>3. construction waste shall not be dumped into the nearby river;</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Excavations and fillings	Air pollution	<p>1. Strengthen on the management and civilized construction, discharge the building materials lightly, it should cover tarpaulin while the vehicles are transporting the materials such as lime, ballast, cement will generating dust.</p> <p>2. It can be prevented from raised dust to do watering and cleaning on the construction sites, and construction roads.</p> <p>3. The transportation of building materials and waste soil shall comply with the local relevant traffic regulations (such as bagging, covering or airtight transportation), at the time of shipment is not overloaded and the soil don't sprinkling.</p> <p>4. The concrete mixer should be located in the shed which should be located away from the densely populated areas such as the residents and schools. There would be a spraying and dust reducing measures while stirring to reduce dust emission.</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
	Earthworks, waste soil transport and disposal ,and solid waste generation	Solid waste pollution	<p>1. It is needed to make a waste disposal and transportation plan to avoid overload transportation which will cause dropping of solid waste.</p> <p>2. It should be classified and centralized storage of the abandoned building materials, and it is suggested to recycle by the collectors for the recyclable materials, and convey the unrecyclable materials to the specified construction waste dumps. It is banned to treat mixed with house waste and discard casually.</p> <p>3 It is suggested that the generated construction waste to be backfilled on the spot as far as possible, residual waste to be transported to other local construction sites, or sent to the designated place to pile up according to the requirements of local environmental protection department. It is resolutely banned to dump the waste into the nearby river and other rivers in China, pickup to relevant departments for bio-safety disposal and utilization timely and orderly.</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	construction and excavation	Serendipitous cultural relic	If discover cultural relics, must stop construction, protect the scene, timely inform the local department for cultural relics protection, the re-excavation work shall not be done till the end of cultural relics identification and protection.		Local cultural relics competent department	
	Construction and transportation vehicles	Noise pollution	<p>1.It should be choose the low noise equipment for construction; While Vehicle transportation at night, should be no honking.</p> <p>2. It is need to take effective noise reduction and vibration reduction measures in construction, such as elastic cushion, cladding, acoustic shield, etc.</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	construction sites and surface soil plantation elimination	Water and soil erosion	<p>1.It is reasonable to arrange the construction time, as far as possible to avoid the storm season to do a large scale excavation and backfill of earthwork, to avoid the rain on the surface of soil erosion and destruction;</p> <p>2. Temporary covers of land should be timely recovery;</p> <p>3. When put the pile temporary, please stack surface soil in the middle of the site, and stack the stone pile up in the surrounding, in order to protect the soil erosion.</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
Operation phase	warehousing activity	Water pollution	<p>1. The construction and household waste water sites can be treated by septic tank after collection,and then discharge into the municipal sewage pipe;</p> <p>2. The fields and waste water treatment facilities should be well anti-seepage treatment,to prevent the underground water pollution.</p>	Project contractor	PMO Local Environmental Protection	Local Environmental Protection bureau,

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
					bureau	Environmental Supervision
	warehousing activity	Air and odour pollution	<p>1. It should enhance the management to reduce the exposed time of abandoned by timely cleaning, to prevent the solid dropping while transportation.</p> <p>2. It should be set a device against the rain and scattering for the temporary solid waste site.</p> <p>3. It is ensured ventilation in construction sites, and spray pesticides regularly.</p> <p>4. It should be cleaned up timely for the solid waste to avoid the odour from fermentation ;</p> <p>5. By the application of the block and absorption of plants, it would greatly reduce the stink.</p>	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	warehousing activity	Solid waste pollution	The waste plastic bags, rotten vegetables and fruits generated from the sites need to collect unified and piled up to the designated garbage dumps, then transfer to waste transfer station, finally into the county comprehensive landfill disposal.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	warehousing activity	Environmental risks	It Should be reasonable located the site, and prepare the corresponding environmental risk plan to enhance facility management.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision

5. Environmental Management Plan of Tourism Development Sub projects

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
Project design phase	The location and layout of feasibility study		Alternative comparison, it is in order to avoid potential negative impacts of construction and operation. The project's location should be avoided in nature reserves, scenic spots, the world cultural and natural heritage sites, drinking water sources reserve, basic grassland, forest park, geological parks, important wetland, natural forests, rare and endangered species of wild fauna and flora natural concentrated distribution area, key soil erosion prevention and control area, eutrophication water area, cultural relics protection units and significant history, culture, science, national protected	FSR Consultant	EIA Consultant, FSR approval agency , PMO	FSR approval agency, PMO

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
			area.Environmental protection facilities and engineering facilities should be designed at the same time, and the cost of environmental protection measures is required to be included in the project investment estimation. The design of buildings and artificial landscape should comply with the local folk customs, cultural traditions and natural landscape.			
Construction phase	Construction water and household waste water	Water pollution	1.It should be strictly managed in saving water, and reduce the construction waste water discharge; 2. Personnel waste water shall not be dumped randomly, to be treated relying on the nearest living facilities. 3. construction waste shall not be dumped into the nearby river;	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Excavations and fillings	Air pollution	1. The earthwork should be stopped in the 4 class or above windy day. 2. Watering regular on the bare surface within the construction site , keep soil moisture, and reduce the dust on surface; 3. It is strictly forbidden to handling waste residue and cement to volley scatters. It is suggested to use enclosed compartment for sporadic materials transportation, to avoid materials dropping which will cause dust; 4. Waste soil should be given on the spot, if it is useless, it should be cleaned up and transported away without delay. When pickup should also be in accordance with the relevant requirements, the pickup vehicle should be covered, and the vehicle speed limit.For earthwork excavation at the same time, in the dry season when construction, should carry on the sprinkler dust, the main operating point may generate dust, such as cement storage area should be set in downwind of the field, and the fence or wind deflector which covered the powder material in its surroundings should be set up temporary, in order to prevent dust diffusion.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Earthworks, waste soil transport and disposal ,and solid waste generation	Solid waste pollution	1. It is advocated civilized construction,and it is needed to make a waste disposal and transportation plan to avoid overload transportation which will cause dropping of solid waste. 2. It should be classified and centralized storage of the abandoned building materials, and it is suggested to recycle by the collectors for the recyclable materials, and convey the unrecyclable materials to the specified construction waste dumps. It is banned to treat mixed with house waste and discard casually. 3 It is suggested that the generated construction waste to be backfilled on the	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
			spot as far as possible, residual waste to be transported to other local construction sites, or sent to the designated place to pile up according to the requirements of local environmental protection department. It is resolutely banned to dump the waste into the nearby river and other rivers in China, pickup to relevant departments for bio-safety disposal and utilization timely and orderly.			
	Construction and excavation	Serendipitous cultural relic	If discover cultural relics, must stop construction, protect the scene, timely inform the local department for cultural relics protection, the re-excavation work shall not be done till the end of cultural relics identification and protection.		Local cultural relics competent department	
	Construction and transportation vehicles	Noise pollution	1.It should be choose the low noise equipment for construction; While Vehicle transportation at night, should be no honking.To strengthen environmental protection education, and do civilized construction, reduce construction noise and life noise pollution on the surrounding environment; 2. It is need to take effective noise reduction and vibration reduction measures in construction, such as elastic cushion, cladding, acoustic shield, etc. While the vehicles in and out of the construction site should be no honking.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Construction sites and surface soil plantation elimination	Water and soil erosion	1.It is reasonable to arrange the construction time, as far as possible to avoid the storm season to do a large scale excavation and backfill of earthwork, to avoid the rain on the surface of soil erosion and destruction; 2. Temporary covers of land should be timely recovery; 3. When put the pile temporary, please stack surface soil in the middle of the site, and stack the stone pile up in the surrounding, in order to protect the soil erosio.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
Operation phase	Tourism activities and accommodations	Water pollution	It is mainly the waste water and sewage from catering, sewerage should be treated by the facilities such as the oil separation tank, septic tanks,biogas pool and other facilities, it can not be directly discharged.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision

Phases	Main activities	negative impact	Mitigation/ prevention and control measures	Executors	Supervisors	Monitoring agency
	Tourists dining and etc.	Air pollution	Mainly is the lampblack, it shall be set up lampblack purifier and special flue for tourist restaurants, to reduce the influence on atmospheric environment.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Tourism activities and accommodations, etc.	Solid waste pollution	1. The household refuse can be unify collected to the the towns waste transfer station, finally entered the county comprehensive landfill to disposal. 2. Refectory garbage can be unify collected and then sent to the specified point.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Environmental Supervision
	Tourism Activities, etc.	Ecological impact	1.It should be considered of the ecological environment, in particular of plants or animals protection, it should be made a reasonable planning for rational development to avoid negative impact. 2.The waste water and solid waste should be reasonable disposed to avoid the impact on the regional ecological environment. 3. Strengthen the environmental protection dissemination for local residents and tourists, to protect the local natural environment, don't pick flowers and plants, don't graffiti or do any other detrimental activities on scenic landscape and ecological environment.	Project contractor	PMO Local Environmental Protection bureau	Local Environmental Protection bureau, Toursim bureau, Environmental Supervision