The World Bank Loan for Guizhou Rural Development Project

Environmental Impact Report

（EIA-B）

（Draft for Examination）

Guizhou Environmental Science Research & Designing Institute

Certificate of National Environment Assessment: Jia Zi No.3302

May 2014 · Guiyang

Table of Responsibility

Project name：	The World Bank Loan for Guizhou Rural Development Project
EIA document：	Environmental Impact Report（EIA-B）
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Major attached pictures：

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Attached Picture1.1-2 Terrain Distribution of the Project-covered Areas

Attached Picture 2.3-1～Attached Picture 2.3-11 Project Distribution of the 11 Project-covered Counties

Attached Pictures in Chapter 4 and 5 Project Process and Sewage Node Picture

Attached Picture in Chapter 7 Public Participation, Field Investigation and Public Consultation Picture

Major attached files：

1.Department relevant documents of Wuchuan County, Wuchuan County, Daozhen County, Nayong County, Hezhang County, Weining County, Dejiang County, Yanhe County, Sinan County, Yinjaing County and Shiqian County;

2. Public Participation survey

3. Foreign Capital Project Management Center of Guizhou Poverty Alleviation and Development Office, Letter of Attorney, 2013.11

1 OVERVIEW

1.1 Project background

1.1.1 Project-covered areas and features

1. World Bank Loan for Guizhou Rural Development Project covers 3 cities and 11 counties in the poverty areas of Wuling Mountain and Wumeng Mountain in Guizhou province, including Zunyi Wuchuan Gelao and Miao Autonomous County (Wunchuan County in short mentioned below), Daozhen Gelao and Miao Autonomous County (Daozhen County in short mentioned below), Zhen'an County; Bijie Nayong County, Hezhang County, Weining Yi and Hui Autonomous County (Weining County in short mentioned below); Tongren Dejiang County, Yanhe Tujia Autonomous County(Yanhe County in short mentioned below), Sinan County, Yinjiang Tujia and Miao Autonomous County(Yinjiang County in short mentioned below) and Shiqian County. See distribution of the project-covered areas in attached figure 1.1-1 and 1.1-2.

Guizhou province is located in southwest of China and the western part of it forms part of the Yunnan-Guizhou Plateau. It is a mountainous area with an average altitude of 1100m. Guizhou province covers a total area of 176,200 sq km among which mountains and hills account for 92.5%. The area of Karst landscape (outcrop) of Guizhou is up to 61.9%, and the problems as fragile ecological environment, soil erosion, and rocky desertification are serious. The resident population of 2010 is 34.75 million among which ethnic population accounts for 38.9 %. There live 50 ethnic groups, including Miao, Buyi, Dong, Tujia, Yi and other ethnic groups and the areas in which they live take up 55.5% of Guizhou. The province has jurisdiction over nine cities (prefectures), 88 county-level administrative regions, among which there are 50 key counties under the help of Development-oriented Poverty Reduction Project for Rural China, 934 poverty-stricken towns, and 13,973 poor villages, and thus is one of the poorest provinces in China. Due to natural, historical and geographical reasons, Guizhou is less developed with blocking traffic, barren land, and the poverty of it is very prominent. The large poverty area and the serious poverty degree make it difficult to reduce poverty in Guizhou. The proposed Development-oriented Poverty Reduction Project is for the remote areas in which ethnic groups live and whose social and economic development has always been developed slowly. Counties and villages are generally linked together, forming a manageable area.

2. Reasons for putting forward the project

Guizhou is the main area for national poverty alleviation, the poverty covers large rural areas, the poverty degree is serious, the number of poor people in rural areas takes up a large amount of China's total population, the poor people have a low level of income, and there is a serious shortage of investment in poverty alleviation, especially the 65 cities and counties in the poverty-stricken areas of three contiguous poor areas of Wuling mountainous area, Wumeng mountainous area, and Yunnan, Guangxi and Guizhou rocky desertification areas. In theses areas the causes for poverty are complicated, the problem of return-to-poverty is serious, and the imbalance of investment and demand is very prominent, thus making it difficult to achieve poverty alleviation. To achieve the overall objective for poverty alleviation

and development in new phase, it is essential to attract more capital into poverty alleviation and development through various means and channels. To implement the World Bank Loan for Development-oriented Poverty Reduction Project, to bring in foreign advanced management modes and concepts of poverty alleviation, to support poverty alleviation by industrialization, infrastructure and services, training and capacity building, project management and assessment and to promote the healthy development of poverty alleviation work can make up for the insufficient investment for poverty alleviation in Guizhou as well as accelerate the process of poverty alleviation in Guizhou.

The 11 project-covered counties are not only poverty-stricken areas but also the key counties of national poverty alleviation and development work. They are in remote area, contiguously linked and suffer fragile ecological environment, poor living conditions and frequent natural disasters, people have a low educational level, the infrastructure and social causes lag behind seriously, all of which make it difficult to implement poverty alleviation work. Therefore, in order to speed up the process of poverty alleviation and realize the objective of poverty alleviation and development, it is of great importance to get the support of World Bank Loan for Guizhou Rural Development Project, increase investment and support, strive to improve living conditions of poor people in remote mountainous areas, make full use of plants and animals species in good quality, good natural ecology and abundant cheap labor resources, develop a number of competitive industries with local advantages, promote the quality and efficiency of agriculture in poor mountainous areas, increase the income of poor farmers, to change the face of the poor mountainous areas, to accelerate the process of poverty alleviation and development in our province to achieve poverty alleviation strategy objectives for poverty alleviation contiguous poor areas to provide demonstration etc have great significance.

1.1.2 Project department and implementation units

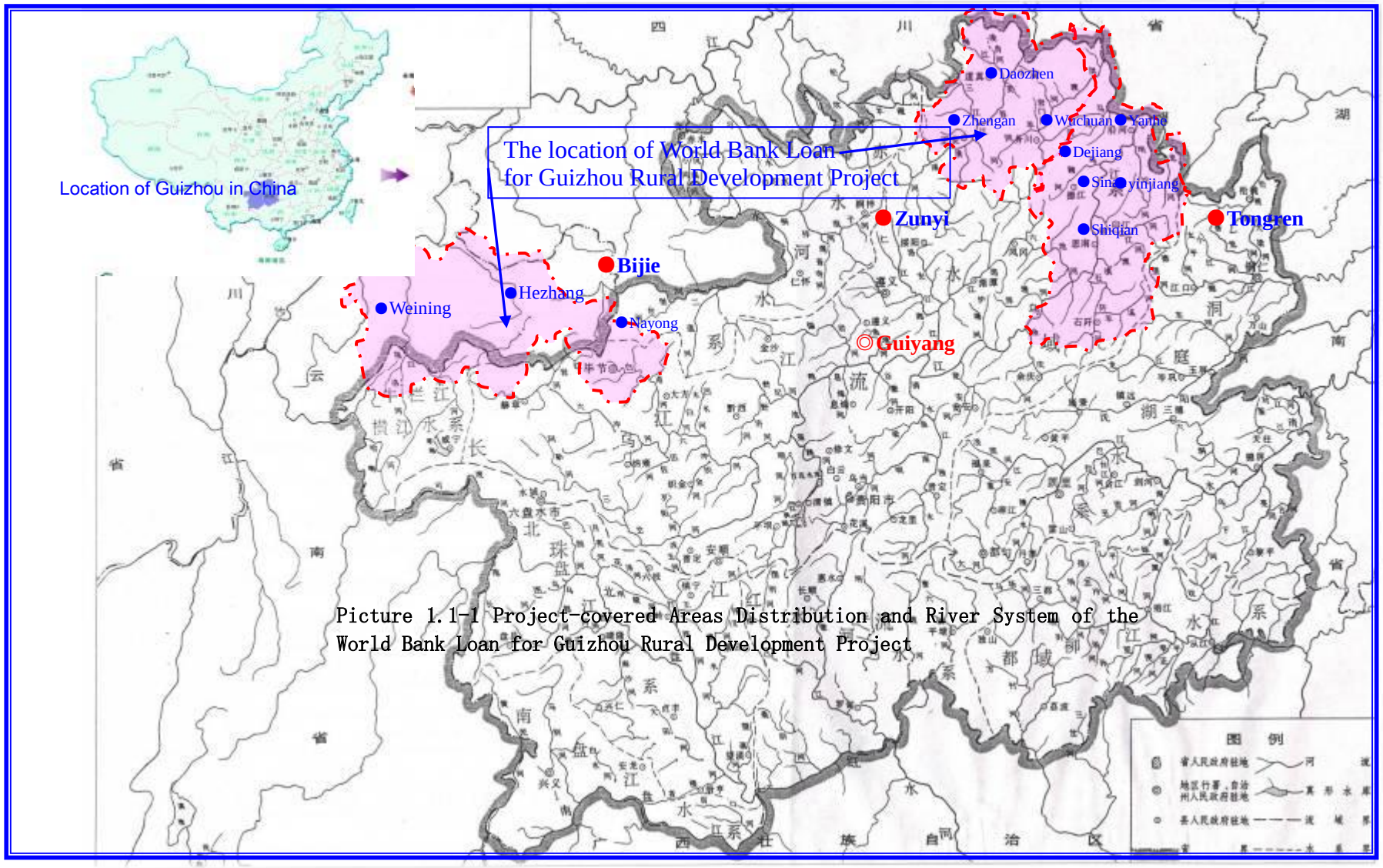
1. Project department

World Bank Loan for Guizhou Rural Development Project Leading Group, Foreign Project Management Center of Guizhou Poverty Alleviation and Development Office , and Three Cities and Eleven Counties Poverty Alleviation Department

2. Implementation units: Cooperative Institution, farmers and companies in 11 counties

1.2 Relations with the relevant national and provincial plans / projects

Picture 1.2-1 and 1.2-6



Picture 1.1-1 Project-covered Areas Distribution and River System of the World Bank Loan for Guizhou Rural Development Project

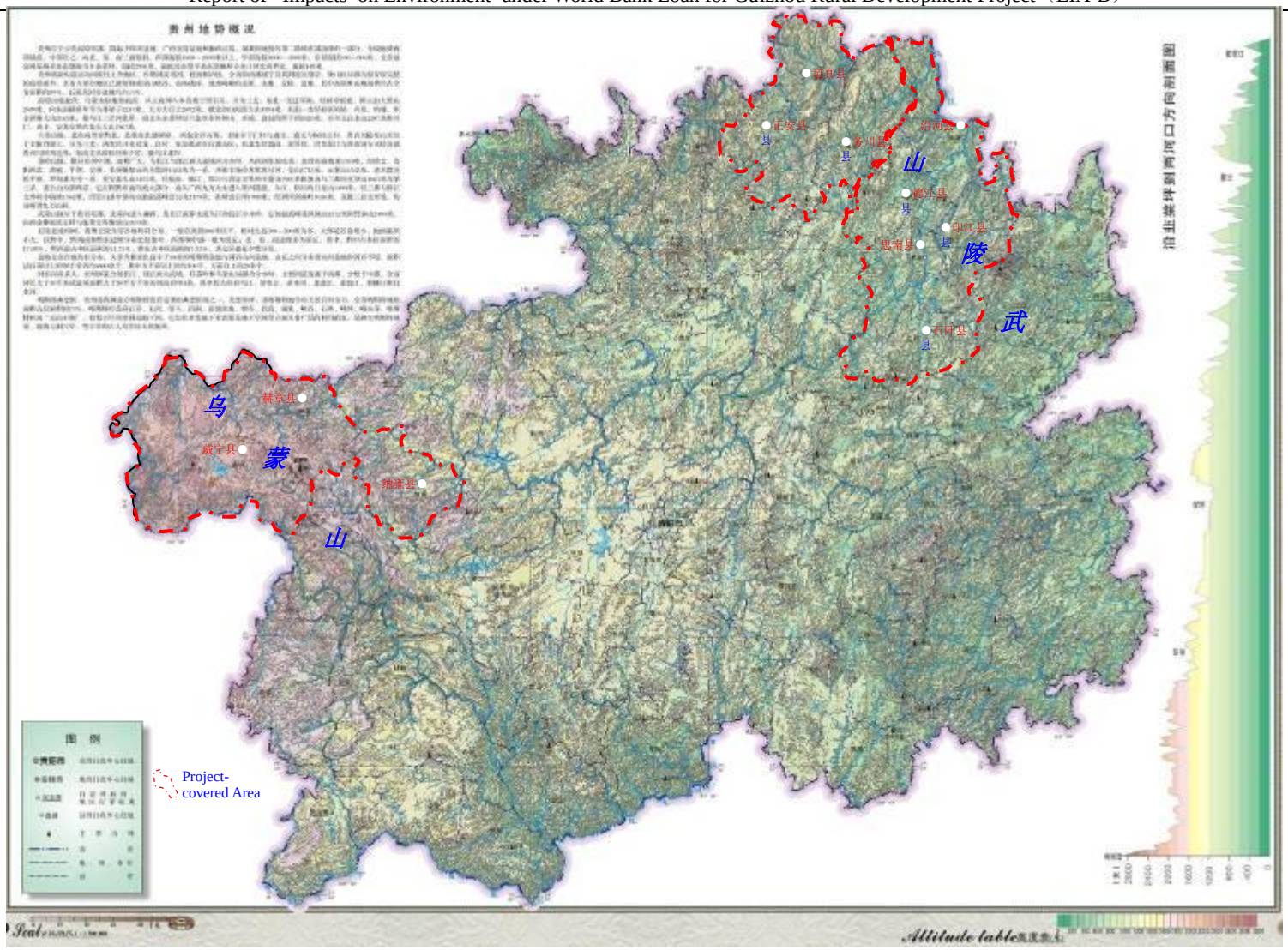

贵州地势概况
道真县
务川县
沿河县
德江县
思南县
印江县
石阡县
武陵山
乌蒙山
赫章县
威宁县
纳雍县
图例
Project-covered Area
沿北京坪到两河口方向剖面图
Altitude table

Figure 1.2-1 Consistency with the Twelfth Five—Year Plan for National Economic and Social Development of the People's Republic of China

Plan	Content		Implementation of the Project	Consistency
The Twelfth Five—Year Plan for National Economic and Social Development of the People's Republic of China	Accelerate the development of modern agriculture	Accelerate the development of agriculture, promote the standardized production of vegetables, fruits, tea, and horticultural products such as flowers, improve the development standard of the livestock industry, increase the weighting of output value of the livestock industry, promote the industrialized operation of agriculture, support and expand agricultural processing and circulation industries, promote the operation of agricultural production in a professional, standardized, large-scale and intensive manner, promote the establishment of models zones for modern agriculture.	The project zone has good environmental quality, highlighting the advantages of resources. The project focused on the development of standardized planting such as tea, vegetables, plum, grapes, walnuts, , potato, gastrodia elata, konjac, ramie, mushroom, honeysuckle, Codonopsis, heterophylla, Radix et., and livestock and poultry as pigs, sheep and chicken, all of which carried out the same time with related infrastructure construction such as farmers markets, rural roads, reservoirs, agricultural cooperatives and other construction and processing industries, which can help achieve agriculture industrialization.	Consistency
	Accelerate agricultural science and technology innovation	Strengthen the innovation, promotion and application of technological integration in areas such as highly efficient cultivation, the prevention and control of diseases and water conservation in agriculture, and promote the integration of agricultural machinery and technique.	The green pest prevention and control technique is used in this project; mechanical operation and scientific training are also used in livestock and planting industries, to accelerate the development of agricultural science and technology.	Consistency
	Improve the agricultural social service system	Strengthen the establishment of public service capacity in agricultural industry, and accelerate the improvement of public service institutions responsible for promoting agricultural technology in towns and regions, prevent and control diseases of animals and plants and regulating the quality of agricultural products.	To establish the cooperative institution, build an product information platform, register green products, establish products storage market, and promote public service services during the implementation of the project.	Consistency
	Consolidate and improve household business income	Encourage farmers to optimize the planting and breeding structure ,improve the production and operation, enable farmer s to share the revenue from the processing, circulation and added value of agricultural products through the industrialization of agriculture and the development of cooperation organization, develop highly-efficient agriculture with special features based on the local conditions.	Increasing the income of farmer through the "under wood planting ", "combination of retail farming and farming community", "planting tea, Gastrodia elata, walnut, potato, etc., based on local conditions" "extensive agricultural cooperatives" .	Consistency
	Strengthen rural infrastructure	Strengthen the construction of water conservancy projects in farmlands in a comprehensive manner, and continue to carry forward the construction of roads in rural areas, new hydro rural electrification and construction projects of small hydropower for fuel.	The project involves the infrastructure construction in rural roads, production pavement, water conservancy and the improvement of rural investment environment and promotion of rural development.	Consistency
	Improve rural environment	Manage pesticides, fertilizers and plastic sheeting and other non-point source pollution, and comprehensively promote livestock pollution prevention.	Promoting green control and farmers training, strengthening the use of pesticides, fertilizers, carrying out effective pollution control measures for livestock pollution and ecological damage, and reducing non-point source pollution during the implementation of the project.	Consistency

Figure 1.2-2 Consistency with China's Framework for Rural Poverty Alleviation and Development (2011-2020).

Plan	Content		Implementation of the Project	Consistency
Consistency with China's Framework for Rural Poverty Alleviation and Development (2011-2020).	Task	By 2020, achieving the target of helping poor people have enough to eat, enough to wear, ensuring that they can acquire compulsory education, basic medical care and housing, ensuring the per capita net income of farmers in poor areas higher than the national average growth rate, the standards for basic public services in main areas achieving the national average indicators, reversing the widening development gap, among which "basic farmland and water conservancy, characteristic advantaged industries, water safety, transportation and other items" are the key tasks for poverty alleviation.	The overall objective of the project is: Lay a solid foundation for building a moderately prosperous society and a society without absolute poverty by increasing the income of poor significantly, improving farmers' production technology and self-development capacity greatly; adjusting agricultural structure reasonably, forming competitive industries initially, the sound development of farmers' cooperative economic organizations, farmers' cooperative institution becoming effective support for agricultural industrialization; improving production and living conditions in project-covered areas fundamentally, improving the environment, environment and public service system through the implementation of "World Bank Loan for Guizhou Rural Development Project".	Consistency
	Scope	Those who have the ability to work but live under the poverty line are mainly the people to be helped. The contiguous poor areas (includes Wumeng mountainous areas) and key counties, poor villages are the main focus.	Among the 11 counties, three counties are included in the contiguous Wumeng mountainous poverty-stricken areas, eight counties are in the Wuling mountainous poverty-stricken areas. In these areas, residents are poor, poverty rate is high, infrastructural construction lags behind, the ability to withstand natural disasters is weak, the industrial varieties is single, the products contain low-tech, and the management is extensive.	Consistency
	Poverty Alleviation Industry	Developing characteristic industries, carrying out technology poverty alleviation, improving infrastructural construction, developing education and culture, improving public health and population service management, improving the social security system, and attaching importance on energy and ecological environment construction.	Promoting the operation of agricultural production in a professional, standardized, large-scale and intensive manner such as developing nine leading industries with local characteristics and advantages such as tea, Gastrodia elata, walnuts, konjac, virus-free potato, corn-fed pigs, white goats, hollow plum, green shell eggs, assisting the registration of green trademark for professional cooperatives, while guiding logistics, processing, markets, etc., to extend the industrial chain, and curb the environmental pollution during the implementation of the project with the support of conditional poverty grants.	Consistency
	International and Social Cooperation for Poverty Alleviation	Strengthening poverty alleviation, promoting cooperation between eastern and western China, mobilizing the participation of all enterprises and communities in poverty reduction, drawing on the theory and practice of the international community for poverty alleviation, implementing poverty alleviation project cooperation, sharing the experience in poverty alleviation, and jointly promoting the development of poverty alleviation.	The project is composed of the World Bank loan and the domestic financial funds. By strengthening cooperation with the World Bank, bringing in capital from the World Bank, it can increase investment in poverty alleviation funds which plays a leading role, guide more international financial organizations to focus on China poverty problems, and make up for the inadequate capital for poverty alleviation investment, as well as can draw on international experiences and practices related to agriculture and farmers' associations, and combine with the actual situation of China's poverty-stricken area to explore new poverty alleviation system, new mechanisms and models with Chinese characteristics.	Consistency

Figure 1.2-3 Consistency with the Twelfth Five—Year Plan for National Economic and Social Development of Guizhou Province

Plan	Content		Implementation of the Project	Consistency
The Twelfth Five—Year Plan for National Economic and Social Development of Guizhou Province	Enhancing the ability of self-development in poverty-stricken areas	Adhere to the development-oriented poverty alleviation policy, vigorously promote characteristic agricultural industrialization focused on poverty alleviation, enhance self-development ability in poverty-stricken areas, strengthen management, promote the combination of efforts of the entire towns (villages) with regional efforts to promote poverty alleviation, and improve the level of industrialization poverty alleviation. Systematically manage and carry out special regional poverty alleviation plan in Wuling Mountainou areas, Wumeng mountainous areas, and Miao mountainous areas (including Ma mountain and Yao mountainous areas), accelerate the speed of poverty alleviation in contiguous areas and extremely poor areas to get rid of poverty and become better off.	The proposed implementation of the project is in Wuling Mountainous areas and 11 counties of Wumeng mountainous areas, and the aim of the project is to accelerate the speed of poverty alleviation in contiguous areas and extremely poor areas.	Consistency
	Striving to develop characteristic advantage agriculture	Developing market-oriented traditional agricultural products, highlighting the advantages in resources, developing local agricultural products, improving the quality of agricultural products, and promoting large-scale production. ● accelerating the development of ecological livestock industry. Stably developing pigs, cattle and sheep, actively developing the specialized farming, strengthening the standardized livestock farms (community), breeding system, animal epidemic prevention system, and forage bases. Vigorously promoting eco-farming projects, striving to create a number of large-scale, standardization and industrialization of high-quality pigs, sheep, cattle and poultry production, and building an ecological livestock industry province. ●Intensifying vegetable industry. Strengthening the standardized system, vigorously developing high-quality pollution-free (green) vegetables. ● Promoting tea industry. To focus on the development of high-quality green tea, continue to strengthen the sound, ecological tea production base construction, improve the large-scale and standardized production levels of tea. Strengthen the comprehensive development and utilization of tea, improve overall economic efficiency of tea. ● Improving potato industry. Speeding up virus-free potato growing systems and production bases construction based on 42 National Potato base counties in Guizhou	The project is focused on standardized planting of economy fruit and nut trees such as tea, vegetables, plum, grapes, walnuts, Gastrodia elata, virus-free potato, konjac, ramie, mushroom, honeysuckle, Codonopsis, heterophylla, Radix et. And other livestock and poultry such as pigs, sheep and chicken etc., while veveloping cooperatives and other related infrastructure and agro-processing industries, vigorously developing local agricultural products, promoting large-scale production, and promoting the development of industrialized agriculture in poverty-stricken areas.	Consistency

		to develop potato products processing, build the largest potato producing areas in China and the largest commercial potato production base, virus-free potato supplying and processing base in the south of China. In 2015, the potato acreage of potato will reach 11 million acres. ●Vigorously developing specialty fruit industry and herbs. Vigorously developing high-quality fruits and walnut, chestnut and other dried fruit, tea and actively promoting the improvement of tea varieties and large-scale cultivation, expanding and regulating planting, and builting a number of standardized production base. In 2015, fruit trees could cover an area of 5million acres, tea 3million acres, and herbs 3million acres.		
	Strengthening the construction of modern agricultural service system	Agricultural technology promotion agencies at all levels as a guide, rural cooperative economic organizations as a basis to vigorously promote the construction of basic agriculture technology promotion system involved in various participants. Accelerating the construction of agricultural products quality standard system, vigorously carrying out pollution-free, green and organic food and agricultural geographical indications certification. Strengthening regulatory capacity for agricultural products quality and safety, improving the supervision and inspection system for agricultural products quality and safety. Strengthening the construction of disease prevention and control system for plants and animals and construction of a major agricultural pest warning and monitoring system, enhancing the ability of effective prevention and control of major animals and plants diseases of major Crops. Improving agricultural information service system and strengthening agricultural market circulation system.	108 farmer cooperatives and 18 agricultural markets will be built in the project; increasing marketing research and development activities, improving quality standards, labeling and certificating, promoting food brand and safety. Strengthening quality and safety regulatory capacity of agricultural products, improving supervision and inspection system.	Consistency

Figure 1.2-4 Consistency with the Twelfth Five—Year Plan for Poverty Alleviation and Development Project (2011-2020) in Guizhou Province

Plan	Content		Implementation of the Project	Consistency
The Twelfth Five—Year Plan for Poverty Alleviation and Development Project in Guizhou Province	Task	Target: to "strengthen comprehensive economic ability in poor areas, improve living standards and quality for the poor, improve environmental protection and poverty alleviation industrial development", improve the environmental conditions in poverty-stricken areas, narrowing the gap between areas through economic and social development, significantly enhancing self-development for poverty alleviation, laying a solid foundation for achieving the objective of "no worries about food, about wearing, enabling compulsory education, basic medical care and housing", thus building a moderately prosperous society. Task: mainly implementing the "Fewer babies and faster to become rich project" in combination of "industrial poverty alleviation engineering" and "labor force employment and entrepreneurship training project", as well as "Three One Project" and "promotion of equalization of public services project". Based on the overall objective of poverty alleviation and development in the Twelfth Five—Year Plan.	The overall target of the project is: increase the income of people in poverty-stricken areas significantly, improve the production technology and self-development capacity of farmers greatly; realize the optimization of agriculture structure, basic formation of competitive industries, sound development of farmer cooperatives which are the leading force to promote development of agricultural industrialization; improve production and living conditions of the project-covered areas fundamentally, improve the environment and optimize public service system, and lay a solid foundation for building a moderately prosperous society, getting rid of absolute poverty in 2020 through the implementation of the " World Bank Loan for Guizhou Rural Development Project ".	Consistency
	Scope	During the "Twelfth Five-Year" period, the poverty alleviation and development work mainly carried out in 65 contiguous poverty-stricken counties (districts, cities) like Wuling mountainous areas, Wumeng mountainous areas, rocky desertification areas in Guangxi, Guizhou, Yunnan and 50 national key poverty alleviation areas. The main objects of this project are those who have working ability but whose income is lower than the national per capita net income.	Among the 11 counties, three counties are included in the contiguous Wumeng mountainous poverty-stricken areas, eight counties are in the Wuling mountainous poverty-stricken areas. In these areas, residents are poor, poverty rate is high, infrastructural construction lags behind, the ability to withstand natural disasters is weak, the industrial varieties is single, the products contain low-tech, and the management is extensive.	Consistency
	Poverty Alleviation Industry	Keep market-oriented, resource-based, technology-supported and natural zoning and planning based industry, highlighting the characteristics and conducting large-scale development, increasing financial discounts and credit financing, vigorously	Promoting the operation of agricultural production in a professional, standardized, large-scale and intensive manner such as developing nine leading industries with local characteristics and advantages such as tea,	Consistency

		intensifying the advantages, developing characteristic industries, striving to build industrial poverty alleviation system of "production , processing and sales ". Making use of abundant natural resources and multi-storied agriculture focusing on the target of building “the important walnut base in the south of China, the important province of grassland ecological livestock industry, the main producing province of herbal medicines in China, the largest potato producing area of China, the main tea producing area, the main green tea producing province in China, the national main vegetable producing areas”.	Gastrodia elata, walnuts, konjac, virus-free potato, corn-fed pigs, white goats, hollow plum, green shell eggs, assisting the registration of green trademark for professional cooperatives, while guiding logistics, processing, markets, etc., to extend the industrial chain, and curb the environmental pollution during the implementation of the project with the support of conditional poverty grants.	
	International and Social Cooperation for Poverty Alleviation	Strengthening poverty alleviation, promoting cooperation between eastern and western China, mobilizing the participation of all enterprises and communities in poverty reduction, drawing on the theory and practice of the international community for poverty alleviation, implementing poverty alleviation project cooperation, sharing the experience in poverty alleviation, and jointly promoting the development of poverty alleviation.	The project is composed of the World Bank loan and the domestic financial funds. By strengthening cooperation with the World Bank, bringing in capital from the World Bank, it can increase investment in poverty alleviation funds which plays a leading role, guide more international financial organizations to focus on China poverty problems, and make up for the inadequate capital for poverty alleviation investment, as well as can draw on international experiences and practices related to agriculture and farmers' associations, and combine with the actual situation of China's poverty-stricken area to explore new poverty alleviation system, new mechanisms and models with Chinese characteristics.	Consistency

Figure 1.2-5 Consistency with Wuling Mountainous Areas Poverty Alleviation and Development Project (2011-2020)

Plan	Content		Implementation of the Project	Consistency
Wumeng Mountainous Areas Poverty Alleviation and Development Project (2011-2020)	Scope	71 counties (cities, districts) in Hubei, Hunan, Chongqing, Guizhou border area, including11 counties (cities) in Hubei, 37 counties (cities, districts) in Hunan, 7 counties (districts) in Chongqing , 16 counties (cities, districts) in Guizhou. Guizhou: Tongren City, Dejiang County, Yanhe county, Sinan County, Yinjiang County, Shiqian County, Jiangkou County, Songtao County, Yuping County, Wanshan district, Wuchuan County, Zhen'an County, Daozhen County , Fenggang County, Meitan County, and Yuqing County.	Dejiang County, Yanhe county, Sinan County, Yinjiang County, Shiqian County, Wuchuan County, Zhen'an County, Daozhen County are all included in Wuling mountainous poverty-stricken areas where residents are poor, poverty rate is high, infrastructural construction lags behind, the ability to withstand natural disasters is weak, the industrial varieties is single, the products contain low-tech, and the management is extensive.	Consistency
	Target	By 2015, halving the number of poor people, initially establishing a sound interactive operating mechanism and system, achieving the rapid development of industries with local advantages based on tourism, optimizing transportation, strengthening public service capabilities significantly, improving environmental quality, and people's living standards, building a moderately prosperous society in a more solid basis; initially form an operating system and mechanism in favor of the poverty alleviation, ecology and population and rural development as a whole. By 2020, achieving the target of helping poor people have enough to eat, enough to wear, ensuring that they can acquire compulsory education, basic medical care and housing.	The overall target of this project is: to cultivate farmer cooperatives covering all poverty-stricken areas in contiguous poor areas, support farmer cooperatives which adhere to market orientation to develop characteristic industries which are based on local natural resources, efficient, environment friendly, high value-added industries, to extend and improve the industrial chains, strive to improve the sharing ratio of the average profit of the industry chain, and to stably increase the income of poor farmers, and thus create poverty alleviation models and innovative industry poverty alleviation mechanism contiguous.	Consistency
	Industry Development	Starting from resource advantages, regional features and industry foundation, guided by market information to strengthen industrial cooperation, optimize the division of labor, speed up industrial restructuring, build more industries in poverty-	Making industrial choices based on principles of consideration of advantages and disadvantages, that is, fully considering the long-term development of industry in the project-covered area, and ensuring that farmers increase income and get rid of poverty in short term. Developing industries that can increase	Consistency

		stricken areas, form regional industrial system and pillar industries with regional characteristics, enhance regional developing capacity, and lay a foundation for the poor to become rich.	the income of farmers, protect the local ecology effectively, and effectively prevent soil erosion and desertification. After comprehensive comparison, nine industries such as tea, Gastrodia elata , walnuts, konjac, virus-free potato, corn-fed pigs, white goats, hollow plum, Lvkedanji are chosen as leading industries.	
	Improving the Living Standards of Rural Areas	Focusing on counties and surrounding towns to accelerate the development of small towns. Relying on small towns to accelerate the construction of new countryside and strengthen the construction of rural production and living facilities.	The project involves construction of rural roads, construction of new irrigation facilities, drip irrigation promotion, green control and modern agriculture development, cattle breeding spot supporting, relevant markets and trading venues supporting, all of which are important for improving the production and living conditions in rural areas.	Consistency
	Ecological Construction and Environmenta l Protection	Focusing on key ecological function areas and ecological projects to ecological security barrier of the Yangtze River. Focusing on the protection of natural forest resources, grassland, rocky desertification control, conservation of aquatic resources, forest protection construction, comprehensive soil erosion control, focusing on ecological exploration-limited areas and all types of development-prohibited natural and cultural protected areas in combination with disaster prevention and response to climate change to strengthen ecological construction and environmental protection, establish ecological security barrier of the upstream of the Yangtze River.	Ensure that infrastructure construction does not occupy basic farmlands; The forage, fruit trees and other planting which can lessen soil erosion and desertification to some extent are mainly for the former grassland improvement without expropriating fertile farmland. During the implementation of the project, these measures are to be carried out: promote green control and farmer training, strengthen the reasonable use of pesticides, fertilizers, make forage planting and effective pollution control measures for livestock pollution and ecological damage, reduce non-point source pollution; put forward practical management approach on project design, construction, operation and maintenance based on the involving Natural Reserve Areas.	Consistency

Figure 1.2-6 Consistency with Wumeng Mountainous Areas Poverty Alleviation and Development Project (2011-2020)

Plan	Content		Implementation of the Project	Consistency
Wumeng Mountainous Areas Poverty Alleviation and Development Project (2011-2020)	Scope	36 counties (cities, districts) in Sichuan, Guizhou, Hunan border area, including 13counties in Sichuan, 10 counties (cities, districts) in Guizhou, 15 counties (districts) in Yunnan. The 10 counties (cities, districts) and one town in Guizhou are: Qixingguan Area, Dafang County, Qianxi County, Zhijin County, Nayong County, Hezhang County, Weining County, Chishui County, Xishui County, Tongzi County and Dawan Town in Zhongshan Area.	Nayong County, Hezhang County and Weining County are all included in Wumeng mountainous poverty-stricken areas where residents are poor, poverty rate is high, infrastructural construction lags behind, the ability to withstand natural disasters is weak, the industrial varieties is single, the products contain low-tech, and the management is extensive.	Consistency
	Target	By 2015, halving the number of poor people, initially establishing a sound interactive operating mechanism and system. By 2020, achieving the target of helping poor people have enough to eat, enough to wear, ensuring that they can acquire compulsory education, basic medical care and housing.	The overall target of this project is: to cultivate farmer cooperatives covering all poverty-stricken areas in contiguous poor areas, support farmer cooperatives which adhere to market orientation to develop characteristic industries which are based on local natural resources, efficient, environment friendly, high value-added industries, to extend and improve the industrial chains, strive to improve the sharing ratio of the average profit of the industry chain, and to stably increase the income of poor farmers, and thus create poverty alleviation models and innovative industry poverty alleviation mechanism contiguous.	Consistency
	Industry Development	Adhere to market orientation, rely on resources, develop pillar industries based on local conditions, undertake industrial transfer, promote intensive development of industrial areas, adjust and optimize the industrial structure, develop recycling economy, build up regional characteristics industrial system, and accelerate the economic development.	Making industrial choices based on principles of consideration of advantages and disadvantages, that is, fully considering the long-term development of industry in the project-covered area, and ensuring that farmers increase income and get rid of poverty in short term. Developing industries that can increase the income of farmers, protect the local ecology effectively, and effectively prevent soil erosion and desertification. After comprehensive comparison, nine industries such as tea, Gastrodia elata, walnuts, konjac, virus-free potato, corn-fed pigs, white goats, hollow plum, Lvkedanji are chosen as leading industries.	Consistency
	Improving	Focusing on improving the life of rural residents,	The project involves construction of rural roads, construction	Consistency

	the Living Standards of Rural Areas	vigorously improving rural production and living conditions, and actively carrying out the construction of small towns and villages. “Improving agricultural production conditions”, “improving the living environment" and “constructing small towns and villages” are the key implementations.	of new irrigation facilities, drip irrigation promotion, green control and modern agriculture development, cattle breeding spot supporting, relevant markets and trading venues supporting, all of which are important for improving the production and living conditions in rural areas.	
	Ecological Construction and Environmental Protection	Focusing on key ecological function areas and ecological projects to ecological security barrier of the Yangtze River. Focusing on the protection of natural forest resources, grassland, rocky desertification control, conservation of aquatic resources, forest protection construction, comprehensive soil erosion control, focusing on ecological exploration-limited areas and all types of development-prohibited natural and cultural protected areas in combination with disaster prevention and response to climate change to strengthen ecological construction and environmental protection, establish ecological security barrier of the upstream of the Yangtze River	Ensure that infrastructure construction does not occupy basic farmlands; The forage, fruit trees and other planting which can lessen soil erosion and desertification to some extent are mainly for the former grassland improvement without expropriating fertile farmland. During the implementation of the project, these measures are to be carried out: promote green control and farmer training, strengthen the reasonable use of pesticides, fertilizers, make forage planting and effective pollution control measures for livestock pollution and ecological damage, reduce non-point source pollution; put forward practical management approach on project design, construction, operation and maintenance based on the involving Natural Reserve Areas.	Consistency

1.3 Relevant policies, laws and regulations and standards

1.3.1 Laws and regulations

● National laws and regulations

1. Law of Environmental Protection of the People's Republic of China (1989,12)
2. Law of the People's Republic of China on Appraising of Environment Impacts (2003,9,1)
3. Law of the People's Republic of China on Soil and Water Conservation (2012,3,1)
4. Law of the People's Republic of China on Land Administration (2004,8,28)
5. Law of the People's Republic of China on Atmospheric Pollution Prevention (2000,4,29)
6. Law of the People's Republic of China on the Prevention and Control of Environmental Noise Pollution (1996,10)
7. Law of the People's Republic of China on Road(2004,8)
8. Law of the People's Republic of China on Prevention and Control of Water Pollution (2008,6,1)
9. Law of the People's Republic of China on Prevention and Control of Solid Waste Pollution(2005,4,1)
10. Forestry Law of the People's Republic of China (1998,4)
11. Grassland law of the People's Republic of China(1985,6)
12. The Animal Husbandry Law of the People's Republic of China
13. The Agriculture Law of the People's Republic of China
14. Animal Epidemic Prevention Law of the People's Republic of China
15. Quality Safety Law of Agriculture Products of the People's Republic of China
16. Law of the People's Republic of China on the Protection of Wildlife(2004,8)
17. Law of the People's Republic of China on the Urban and Rural Project (2008,11)
18. The Law of the People's Republic of China on Promotion of Cleaner Production (2003,1,1)
19. Flood Control of the People's Republic of China (1998,1,1)
20. Law of the Peoples Republic of China on Protection of Cultural Relics(2002,10,28)
21. Regulations on the Protection of Basic Farm the State Council Decree No.493 (1999,1,1)
22. Regulations on the Administration of Construction Project Environmental Protection the State Council Decree No.253(1998,11)
23. Law of the People's Republic of China on the Protection of Wildlife (1992)
24. Law of the People's Republic of China on the Protection Wild Plants(1997,1,1)
25. Rules for the Implementation on Law of the People's Republic of China on Protection of Cultural Relics(2003,7,1)
26. National Ecological Environment Protection Outline, No 38 Document in 1996 of the State Council (2001,3,2)
27. Decision on Implementing Scientific Concept of Development and Strengthening Environ mental Protection by the State Council, No 39 Document in 2005 of the State Council (2005,12)
28. Some Suggestions on the State Council on Further Promoting Sound and Rapid development of Economy and Society in guizhou ,No 2 Document in 2012 of the State Council (2012,1,12)
29. Regulations on the Management of Landscape Scene(2006,9,6)
30. Regulations of the People's Republic of China on Nature Reserves (1994,10,9)
31. National Industrial Restructuring Guidance Catalogue 2011
32.Catalogue Management of Project Environmental Impact Assessment on the Construction（2008.10.1）

33.Notice on Strengthening International Financial Organizations Loan for the Management of Project Environmental Impact Assessment on the Construction(1993,6)
34. Rules for Livestock and Poultry Farms Pollution Control and Prevention(2001,3)

● Local laws and administrative regulations

1. Environmental Protection Regulations of Guizhou Province (2009,6)
2. Basic Farm Protection Regulations of Guizhou Province (National People's Congress of Guizhou province, 1999, 9 ,25)
3. Water Function Regionalization of Guizhou Province (People's Government of Guizhou province, 2006, 10)
4. Ecological Function Regionalization of Guizhou Province (Environmental Protection Agency of Guizhou province, 2005, 5)
5. Measures on the Protection of Wildlife in Guizhou Province (People's Government of Guizhou province, 1992, 10, 17)
6. Measures on the Protection of Wildlife Resources in Guizhou Province (People's Government of Guizhou province, 1995, 7, 28)
7. Regulations for the Protection of Cultural Relics in Guizhou (National People's Congress of Guizhou province, 2005, 9, 23)
8. Measures for the Management of Scenic Areas in Guizhou province (People's Government of Guizhou province, 1995, 7, 28)
9. Regulations on National Folk Culture Protection of Guizhou province (2002, 7, 30)
10."Decision of Several Issues on the Environmental Protection" By People's Government of Guizhou province (1999, 6)
11. Guizhou province "Twelfth Five-year" Special Ecological Construction and Environmental Protection Projects (2011)

1.3.2 Policy requirements

●Technical specification

1. HJ2.1-2011 Environmental Impact Assessment Technical Guideline - General Principles 2012.1.1
2. HJ2.2-2008 Environmental Impact Assessment Technical Guideline---Atmospheric Environment, 2009, 4, 1
3. HJ/T2.3-93 Environmental Impact Assessment Technical Guideline---Surface Water Environment
4. HJ2.4-2009 Environmental Impact Assessment Technical Guideline---Acoustic Environment 2010.4.1
5. HJ 19-2011，Environmental Impact Assessment Technical Guideline---Ecological Influence,2011
6. HJ 610-2011 Environmental Impact Assessment Technical Guideline---Groundwater Environment, 2011
7. GB50433-2008 The Technical Specification of Development and Construction Project of Soil and Water Conservation
8. HJ/T192-2006, The Ecological Environment Assessment Specification（Trial）, 2006,5,1；
9. HJ/T169-2004, Technical Guideline for Environmental Risk Assessment on Construction Projects, 2004, 12, 11
10. JTG B03-2006, Environmental Impact Assessment on Highway Construction Project（Trial）;
11. Environmental Protection Agency of Guizhou province, NO. 28(2006). Interim Procedures OF Public Participation IN Environmental Impact Assessment,

2006.3.18；
12. Environmental Protection Agency of Guizhou province, NO. 152(2005). Notice on Strengthening Environmental Impact Assessment on the Management and Prevention of Environmental Risk
13. GB50434-2008.The Standards of Development and Construction Project of Soil and Water Loss Prevention
14. DB52/T725-2011. Guizhou Industry Water Use Quota
15.Technical Specification Livestock and Poultry Breeding Pollution Control Engineering （HJ497-2009）；
16.Technical Specification of Livestock and Poultry Pollution Prevention （HT/T81-2001）；
17.Guizhou Industry Water Use Quota（DB52/T725-2011）；
18. Administration Measures for Livestock and Poultry Pollution Prevention and Control （2001.3）；
19. The Specification of Tea Safety Production and Plant Technical Specification（DB33/T 675—2008）；
20. Chinese Herbal Medicine Production Quality Management Specification (Trial GAP).State Drug Administration, NO.32
21. Technology Procedures Potato Detoxication and production （GB/T29378-2012）；
22. The Pollution-free Food --- the Pig-Breeding Management Guidelines（NY/T5033）；
23. The Pollution-free Food --- the Chicken-Breeding Management Guidelines (NY5043）；
24. Green food-Fertilizer Application Guideline （NY/ T 394-2000）；
25. Green food-Pesticide Application Guideline （NY /T 393-2000）。

●Relevant policies of the World Bank

1. The World Bank Business Handbook - Environment Assessment (OP4.01)；
2. The World Bank Business Handbook -Natural Habitat (OP4.04)；
3. The World Bank Business Handbook -Pest Management (OP4.09)；
4. *BP17.50 Information Disclosure Policy ;
5. General Guidelines of Environmental Health and Safety；
6. Environmental Health and Safety Guidelines of Mammals Livestock
7. Environmental Health and Safety Guidelines of Annual Agricultural Products；
8. Environmental Health and Safety Guidelines of Food and Beverage Processing；

●Documents and materials

1. The Twelfth Five-Year Project Outline of the National Economic and Social Development of the People's Republic of China
2. Several Suggestions ff The State Council on Further Promoting Sound and Rapid Development of Economy and Society in Guizhou(No.2 Document in 2012 of the State Council)
3. China's Rural Poverty Alleviation and Development Program (2011-2020)
4. The Modern Agricultural Development Projects （2011—2015）（ No.4 Document in 2012 of the State Council)；
5. Regional Development and Poverty Alleviation Projects in the Wuling Mountain（2011—2020）；
6. Regional Development and Poverty Alleviation Projects in the Wumeng Mountain

（2011－2020）；
7. The 12th Five-Year Project Outline of National Economic and Social Development in Guizhou；
8. The 12th Five-Year Poverty Alleviation and Development Projects in Guizhou；
9. The 12th Five-Year Special Characteristic Agriculture Development project in Guizhou ；
10. The 12th Five-Year Poverty Alleviation of Ecological Animal Husbandry Industrialization in Guizhou;
11. The12th Five-Year Poverty Alleviation of Potato Detoxification Industrialization in Guizhou；
12. Poverty Alleviation and Development Office, Foreign Capital Project Management Center in Guizhou，the World Bank Loan Project Proposal Guizhou Rural Development Projects ;
13. Poverty Alleviation and Development Office, Foreign Capital Project Management Center in Guizhou，the World Bank Loan Project Proposal Guizhou Rural Development Projects Feasibility Study Report ;
14. The World Bank Loan Project Proposal Guizhou Rural Development Projects Feasibility Study Report of 11 counties: Wuchuang County, Daozhen County, Zheng'an County, Nayong County, Hezhang County, Weining County, Dejiang County, Yanhe County, Sinan County, Yingjiang County, Shiqian County.
15. Environmental Science Research and Design Institute of Guizhou, the Outline of World Bank loan in Guizhou Rural Development Project Environmental Impact Assessment"，2013.9；
16. Related Certified Documents of the Departments in 11 counties: Wuchuang county, Daozhen county, Zheng'an county, Nayong county, Hezhang county, Weining county, Dejiang county, Yanhe county, Sinan county, Yingjiang county, Shiqian county.
17. Poverty Alleviation and Development Office, Foreign Capital Project Management Center in Guizhou，Letter of Authorization,2013.11。

1.3.3 Assessment standards

●Environment quality standards

(1) Air: the assessment of project-covered area is in accordance with the National Ambient Air Quality Standard (GB3095-1996）and the secondary standard of “the notice of amendments on Ambient Air Quality Standard (GB3095-1996)” released by SEPA document No.[2000]1. See Standards in Figure 1.3.3-1.

Figure 1.3.3-1 Assessment Standards for Current Ambient Air Quality Unit：mg/m³

Assessment Factor	Daily Average	Hour Average	Remark
SO_2	0.15	0.50	GB3095-1996 Secondary Standard
NO_2	0.12	0.24	
TSP	0.3	/	

（2）Noise：the project-covered areas are all in rural areas, implementing the Category2 standard in Environmental Quality Standard for Noise (GB3096-2008). See standards in Figure 1.3.3-2.

Figure 1.3.3-2 Assessment Standards for Current Sound Environment Quality Unit：dB（A）

Time / Standard	Nighttime	Daytime

GB3096-2008 Catatory2	60	50

（3）Surface water：the assessment for the surface water in the project-covered areas is carried out in accordance with Ⅱ, Ⅲ Standard in Environmental Quality Standard for Surface Water (GB3838-2002). See standards in figure 1.3.3-3.

Figure 1.3.3-3 Environmental Quality Standards for Surface Water (excerpt) Unit: mg/L（pH not included）

Item	pH	COD	BOD_5	DO	Oil	NH_3-N	Permanganate Index
Ⅱ Standard	6-9	≤15	≤3	≥6	≤0.05	≤0.5	≤4
Ⅲ Standard	6-9	≤20	≤4	≥5	≤0.05	≤1.0	≤6

（4）Underground water：the implementation is in accordance with Ⅲ Standard in Environmental Quality Standard for Underground Water（GB/T14848-93）. See standards in figure 1.3.3-4.

Figure 1.3.3-4 Environmental Quality Standards for Underground Water (excerpt) Unit:mg/L（excerpt pH）

Item	pH	GH	NTT（Calculation by N）	Sulfate	Cyanide	Total Coliform group (个/L)	NH_3-N	Permanganate Index
Ⅲ Standard	6.5-8.5	≤450	≤20	≤250	≤0.05	≤3.0	≤0.2	≤3.0

●Standard for emission of pollutants

（1）Exhaust gas：the emission of exhaust gas is in accordance with the secondary standard in Standard for Emission of Odorous pollutants （GB14554-1993）and the secondary Comprehensive Emission Standard for Atmospheric Pollutants (GB16297- 1996). See standards in Figure 1.3.3-5.

The emission of cooking fume in dinning areas of agricultural products market is in accordance with Emission Standard for cooking Fume in Food Industry (Trial)（GB18483-2001）. See the items in Figure 1.3.3-6and Figure 1.3.3-7.

Figure1.3.3-5 Emission Standard for Atmospheric Pollutants Unit： mg/m^3， dimensionless odor concentration

Pollutant	Maximum allowable emission concentration（monitoring emission, 15m exhaust tunnel）		Fugitive Emission Monitoring SCLs		Standard
	Concentration（mg/m^3）	Speed（kg/h）	Monitoring Place	Concentration（mg/m^3）	
SO_2	550	2.6	Concentration Peak outside	0.40	GB16297-1996 Secondary Standard
NO_2	240	0.77		0.12	
TSP	120	3.5		1.0	
Ammonia	/	4.9	Concentration Limit in Factory	1.5	GB14554-1993 Secondary Standard
Hydrogen sulfide	/	0.33		0.06	
Odor Concentration	/	2000		20	

Figure 1.3.3-6 Emission Standard for cooking Fume in Food Industry (Trial)（GB18483-2001）Food Industry Scale Division

Scale	Small	Medium	Large
Standard Gas Stove Number	≥1， <3	≥3，<6	≥6
Total Power of Related Stoves(10^8J/h)	1.67，<5.00	≥5.00，<10	≥10
Total Projected Area of Related Hood Emission Cooker(m^2)	≥1.1，<3.3	≥3.3，<6.6	≥6.6

Figure 1.3.3-7 Maximum allowable concentration of fumes and the lowest removal efficiency soot emission purification facilities

Scale	Small	Medium	Large
Maximum allowable emission concentration（mg/m^3）	2.0		
The lowest removal efficiency（% ）	60	75	85

（2）Wastewater：the emission of wastewater into rivers is in accordance with the primary standard in Integrated Standard for Wastewater Emission（GB8978-1996）. See Figure 1.3.3-8；the emission of wastewater into agricultural irrigation ditches is in accordance with Quality Standard for Irrigation Water（GB5084-2005），see Figure 1.3.3-9.

Figure 1.3.3-8 Integrated Standard for Wastewater Emission Unit：mg/L(pH not included）

Item	pH	COD	BOD_5	Animal and Plant Oil	Oil	NH_3-N	SS
Primary Standard	6～9	100	20	10	5	15	70

Figure 1.3.3-9 Quality Standard for Irrigation Water Unit：mg/L（pH not included）

Crop Species	pH	COD	BOD_5	SS
Water Crop	5.5-8.5	150	60	80
Rain-fed Crop		200	100	100
Vegetable		100^a,60^b	40^a,15^b	60^a,15^b

Note：a Process, cook and peel vegetables；b Raw vegetables, melons and herbal fruits

（3）Noise: the noise produced in construction is in accordance with the Standardized number in Emission Standard of Environment Noise in Construction Site（GB12523-2011）, see Figure 1.3.3-10; the noise produced in operational period is in accordance with Catagory2 Standard in Emission standard for Industrial Enterprise Noise (GB 12348-2008),see Figure 1.3.3-11.

Figure 1.3.3-10 Standardized Number of Emission Standard of Environment Noise in Construction Site Unit: dB（A）

Nighttime	Daytime
70	55

Figure 1.3.3-11 Standard of Emission standard for Industrial Enterprise Noise Unit:dB（A）

Standard	Nighttime	Daytime
(GB12348-2008)Category2 Standard	60	55

（4）Pollutant emission standards for livestock and poultry breeding industry (GB18596-2001).

①Wastewater emission standards for livestock and poultry breeding industry

Dry collection will be used for livestock and poultry breeding and should be in

accordance with the regulations about wastewater emission in Pollutant Emission Standards for Livestock and Poultry Breeding Industry (GB18596-2001), see Figure 1.3.3-12, Figure 1.3.3-13 and Figure 1.3.3-14 respectively.

Figure 1.3.3-12 Maximum Allowable Water Emission Amount of Dry Collection in Intensive Livestock and Poultry Breeding （GB18596-2001）

Category	Pig（m^3/one hundred·one day）		Chick（m^3/one thousand·one day）		Cattle（m^3/one hundred·one day）	
Season	Winter	summer	Winter	Summer	Winter	Summer
Standard	1.2	1.8	0.5	0.7	17	20

Note: one hundred and one thousand are all referred to the left numbers of pigs, chicks and cattle in maximum allowable water emission unit.

The water emission amount is calculated according to the average amount in winter and summer.

Figure 1.3.3-13 Daily Maximum Allowable Average Concentration of Water Pollutant Emission in Intensive Livestock and Poultry Breeding（GB18596-2001）

Monitoring Item	BOD5(mg/l)	COD(mg/l)	Suspended Solid(mg/l)	Cyanamid Nitrogen (mg/l)	TP （Calculation by ）(mg/l)	Number of fecal coliforms (个/ml)	Ascarid egg (number/l)
Standard	150	400	200	80	8.0	10000	2.0

Figure 1.3.3-14 Wastewater Composition of Mammal Poultry Breeding Industry(World Bank Standard)

Pollutant	Unit	World Bank Poultry EHS Direction	Quality Standard for Irrigation Water （GB5084-2005）			Pollutant Emission Standards for Livestock and Poultry Breeding Industry (GB18596-2001).
			Water Crop	Rain-fed Crop	Vegetable	
pH	pH	6～9	5.5～8.5			--
BOD	mg/L	50	60	100	40[a],15[b]	150
COD	mg/L	250	150	200	100[a],60[b]	400
TN	mg/L	10	---	---	---	---
TP	mg/L	2	----	----	----	8
Fat	mg/L	10	----	----	----	---
Total amount of suspended solids	mg/L	50	80	100	60[a],15[b]	200
Temperature Increment	℃	＜3[b]	35			---
Total Escherichia	MPN[a]/ 100mL	400	4000	4000	2000[a],1000[b]	1000

Note: [a] MPN=Most Probable Number; [b] Based on comprehensive consideration of water quality, use of water, potential recipient and the assimilation ability, finding a mixing zone through scientific method, which means temperature increment.

Standards in Figure 1.3.3-14 are the standards for wastewater emission in livestock and poultry breeding released by World Bank Environment, Health and Safety Guidelines for the environment of Mammal livestock and Poultry Breeding. Compared with the water emission based on Pollutant Emission Standards for Livestock and Poultry Breeding Industry (GB18596-2001), Quality Standard for Irrigation Water（GB5084-2005）, other indexes (such as COD, total amount of suspended solids) are less strict than domestic pollutant emission standards for livestock and poultry breeding industry except that the control over the total amount of BOD and E. coli is more strict. Moreover, Quality Standard for Irrigation Water（GB5084-2005）is applicable for irrigation water which comes from surface water, underground water and treated wastewater in breeding industry and from the

wastewater in agricultural products processing. Considering from the wastewater emission, regionalism and the strict degree of this project, wastewater emission standard will follow Quality Standard for Irrigation Water（GB5084-2005）. Meanwhile, BOD and Total Escherichia could follow the related index in Environment, Health and Safety Guidelines for the environment of Mammal livestock and Poultry Breeding

②Environmental Standard for Harmless Waste Residue in Livestock and Poultry Industry

A. Livestock and poultry industry must set fixed storage facilities and sites, The storage sites must take measures to prevent the leaking and overflowing of liquid manure.

B. Harmless treatment must be done on the manure for fields.

C. Pouring the waste residue into surface water and other place directly is not allowed. The manure for fields should be within the farmlands' maximum loading capacity in order not to cause water source pollution and underground water pollution.

D. The waste residue after harmless treatment should be in accordance with the standards in Figure 6 of Pollutant Emission Standards for Livestock and Poultry Breeding Industry (GB18596-2001).

Figure 1.3.3-15 Environmental Standard for Harmless Waste Residue in Livestock and Poultry Industry

Monitoring Item	Index
Ascarid egg	Death Rate≥95%
Number of fecal coliforms	≤10^5个/kg

③Odor Pollutants in Livestock and Poultry Industry

Odor pollutants in intensive livestock and poultry industry should follow the Standards in figure 7 of Pollutant Emission Standards for Livestock and Poultry Breeding Industry (GB18596-2001). See figure 1.3.3-16.

Figure 1.3.3-16 Pollutant Emission Standards for Intensive Livestock and Poultry Industry

Monitoring Item	Standard
Odor Concentration(dimensionless)	70

（5）Farming-related environmental standard for crop production

Agricultural farming involves water, fertilizers, inapproriate irrigation and fertilization will lead to certain environmental pollution. According to the related standards in Annual Crop Production Environment, Health and Safety Guidelines by World Bank, it can be classified as annual crop nutrition needs and waster consumption, see figure 1.3.3-17 and 1.3.3-18.

Figure 1.3.3-17 Annual Crop Nutrition Need （Word Bank EHS Guideline）

Annual Crop [a]	Nutrition/Production（kg/100kg）b			
	N	P_2O_5	K_2O	MgO
Grain	2.30～3.15	0.94～1.37	1.88～3.62	0.30～0.46
Potato and Beetroot for Feeding	0.31	0.10～0.15	0.42～0.79	0.02～0.11
Corn for Feeding	0.38	0.14	0.70	0.08
Alfalfa and Purple Alfalfa	0.80	0.16	0.70	0.08
Mixture of Green Forage	0.40	0.14	0.60	0.05

Note: [a]Poland GAP, Paula Institute of soil science and Plant Cultivation,1999;
[b]moderate amount of byproducts.

Figure 1.3.3-18 Specific Annual Crop Water Consumption （Word Bank EHS Guideline）

Annual Crop	Water Need of Crop b（mm，entire growth phase）	Typical Production and Efficiency
corn	500～800	Under irrigation, the relatively good economic grain yield is 6 ~ 9t/hm2 (containing 10% to 13% moisture). The water using efficiency in harvested yield (Ey) varies from different varieties, 0.8 ~ 1.6kg/m3
Sorghum / millet	450～650	When per hectare of irrigation water amounts to 3.5 ~ 5t, it is possible to obtain a high yield (12% to 15% moisture). The water using efficiency in harvested yield (Ey) is between 0.6 ~ 1.0kg/m3
Potato	500～700	Under irrigation, the growing period of crop is about 120d, and in temperate and subtropical regions, a good yield per hectare could reach 25 ~ 35t, in the tropics 15 ~ 25t per hectare. The water using efficiency in harvested yield (Ey) is: 4 ~ 7kg/m3 calculated according to 70% ~ 75% contained water in fruits.
Wheat	450～650（high yield）	Under irrigation, the relatively good wheat yield is 4 ~ 6t/hm2 (12% ~ 15% moisture). The water using efficiency in harvested yield (Ey) is 0.8 ~ 1.0 kg/m3

Note：aFAO（2002a）。bFAO AGL（1991）。

（6）Relevant processing environmental standard

①Related food processing environmental standard

Food processing mainly involves food walnut series, herbs series processing, hollow Plum preservation and processing, tea processing, konjac primary processing etc..

According to Food and Beverage Processing Environment, Health and Safety Guideline by the World Bank, PM emission of food processing should not exceed the standard of 50mg/m^3.

The limited amount according to the secondary standard in Air Pollutant Emission Standards (GB16297-1996) is （≤120 mg/m^3）, from the perspective of long-term environment protection and development of enterprises, EIA suggest the implementation of PM emission follow the standard of ≤ 50 mg/m3 while other pollutants follow the secondary standard in Air Pollutant Emission Standards (GB16297-1996). As for wastewater emission see Figure 1.3.3-19 of Food and Beverage Processing Environment, Health and Safety Guideline by the World Bank.

Figure 1.3.3-19 Wastewater Emission Level of Food and Beverage Industry （world Bank EHS Guideline）

Pollutant	Unit	Guidance
pH	pH	6～9
BOD5	mg/L	50
COD	mg/L	250
TN	mg/L	10
TP	mg/L	2
Oil and Fat	mg/L	10
Total Suspended Solids	mg/L	50
Temperature Increment	℃	＜3[b]
Total Coliform Group	MPN[a]/100mL	400
Active Ingredient / Antibiotics	Depending on the specific condition	

Note：[a]MPN=Most Probable Number；

[b]Measure at the edge of the mixing pollution zone which is established through scientific method and which has taken into such factors into consideration as impact on water quality, water use, potential recipient and the assimilation ability etc..

Figure 1.3.3-19 shows the guidance about water pollutant emission in food and

beverage industry according to Food and Beverage Processing Environment, Health and Safety Guideline by the World Bank. Only parts of the guidance are better than the primary standards in Quality Standard for Irrigation Water（GB5084-2005）and Integrated Standard for Wastewater Emission （GB8978-1996）. Meanwhile Irrigation Water（GB5084-2005）and Integrated Standard for Wastewater Emission （GB8978-1996）are formulated according to domestic water environment, which are much more applicable. Moreover, from the perspective of wastewater emission, regionalism and the strict degree of this project, wastewater emission in food processing industry will strictly follow the primary standards in Quality Standard for Irrigation Water（GB5084-2005）or Integrated Standard for Wastewater Emission（GB8978-1996）. See relevant indexes in Food and Beverage Processing Environment, Health and Safety Guideline by World Bank.

②Relevant standard for other non-food processing industry

Non-food processing industries in this project are: forage processing, organic fertilizer processing, abattoirs, ramie pre-processing. As there are no relevant standards by the World Bank, other non-food processing standards will follow the relevant domestic standards.

Exhaust gas produced in abattoirs：in accordance with Malodorous Pollutant Emission Standard (GB14554-93), see Figure 1.3.3-20；Wastewater in abattoirs: in accordance with Water Pollutant Emission Standard for Meat Processing Industry (GB13457-92)，see Figure 1.3.3-21.

Figure 1.3.3-20 Malodorous Pollutant Emission Standard (GB14554-93)

Pollutant	Unit	Guidance
Ammonia	mg/m^3	1.0
Hydrogen Sulfide	mg/m^3	0.03

Figure 1.3.3-21 Water Pollutant Emission Standard for Meat Processing Industry (GB13457-92)

NO.	Pollutant		unit	Guidance
1	Suspended Solids	Emission Concentration	mg/L	60
		Total Amount of Emission	kg/t(Live Slaughter Weigh)	0.4
2	BOD	Emission Concentration	mg/L	30
		Total Amount of Emission	kg/t(Live Slaughter Weigh)	0.2
3	COD	Emission Concentration	mg/L	80
		Total Amount of Emission	kg/t(Live Slaughter Weigh)	0.5
4	Animal and Plant Oil	Emission Concentration	mg/L	15
		Total Amount of Emission	kg/t(Live Slaughter Weigh)	0.1
5	Nitrogen	Emission Concentration	mg/L	15
		Total Amount of Emission	kg/t(Live Slaughter Weigh)	0.1
6	pH	Emission Index	Dimensionless Number	6.0-8.5
7	Bacillus Coli	Emission Concentration	one/L	5000
8	Water Emission Amount	Total Amount of Emission	kg/t(Live Slaughter Weigh)	6.5
9	Technology Reference	Oil and Fat Recovery Rate	%	> 75
		Blood Recovery Rate	%	> 80
		Gastrointestinal staff Recovery Rate	%	> 60
		Leather Recovery Rate	%	> 90
		Wastewater Recovery Rate	%	> 15

（8）Soil Erosion Assessment Standard

Soil erosion assessment standards take the average amount of soil erosion of

many years as a reference, and are classified according to figure 1.3.3-22 of Industry Standards of People's Republic of China - Standards of Soil Erosion Classification (SL190-2007).

Figure 1.3.3-22 Grading of Soil Erosion Degree

LEVEL	AVERAGE EROSION MODULUS [t/(km^2·a)]
Micro-level Erosion	<200，500，1000
Mild Erosion	200，500，1000～2500
Medium Erosion	2,500～5000
Strong Erosion	5,000～8000
Extremely Strong Erosion	8,000～15000
Extremely serious Erosion	>15000

1.4 Assessment scope, level, factor and focus

1.4.1 Assessment scope，Figure1.4.1-1

Figure 1.4.1-1 Assessment Scope List

Environment Factor	Assessment Scope
Ecological Environment	Take the boundaries of climate unit, hydrological unit, ecological unit and geographic unit involved in project-impacted areas as a reference.
Sound Environment	200m outside the Construction site, 200m away from the central line of highway respectively during operating period; the assessment scope for processing and slaughtering is 200m away from the construction sites; the assessment scope for livestock and poultry industries is 200m within the breeding sites.
Water Environment	Surface water and underground water involved in the project.
Air	200m away from the central line of highway respectively and the sensitive sites; 5km diameter area centered on processing factories and slaughterhouses; the scope for livestock and poultry breeding project is within the area centered on livestock and poultry breeding sites, forming a square with 5km-length side.
Social Environment	The focuses are counties, towns and villages directly influenced by the subprojects and other counties (cities, districts) influenced by subprojects indirectly, including infrastructure, resources and landscape within the 200m scope away from the central line of highway.

1.4.2 Level assessment

1、Assessment type of the project

The assessment level depends on the environment requirement of the project area, features, nature, scale, and scope and degree of its influence, Notice on Strengthening the Assessment and Management of the Project Environment Influence under Loans of International Financial Organizations (HJ [1993]324) released by former State Environmental Protection Administration and Relevant Technical Guidelines for Environmental Impact Assessment and the World Bank Operational Manual - Environment Assessment OP4.01. See assessment types in figure 1.4.2-1.

Figure 1.4.2-1 Environment Impact Assessment Types of Construction Project

Type	Environment Impact	Assessment
Type A	Construction projects that may have a great impact on the environment	Overall environment impact assessment
Type B	Construction projects that have certain impact on the environment; and the impact can be mitigated by advanced technology and prevention measures	Special environment impact assessment or environment impact analysis based on the project and environment instead of overall assessment
Type C	Construction projects that have few impact on the environment	No environment impact assessment or environment impact analysis, but a record of management on environment

		protection is needed.

According to the property, scale, impact degree of the project and environment features, it can be concluded that its impact on the environment is short-term, unnoticeable and reversible. Thus, the assessment type of the project belongs to B (EIA-B).

2. Figure 1.4.2-2 is the assessment level of each aspect

Figure 1.4.2-2 Assessment Level of each Subject

Assessment Subject	Level Assessment	Basis of Division
Ecological Environment	III	According to Technical Guidelines for Environmental Impact Assessment • Ecological Impact(HJ19-2011), the project has a wide range with diversified ecological types but low development intensity, which focuses on the households; the land for roads construction is on the village basis. It bases its internal deployment on respect for public opinions, and there is no land requisition.
Ambient Noise	III	According to Technical Guidelines for Environmental Impact Assessment • Ambient Noise（HJ2.4-2009）, noise environment functional area of the project is standard area of type I and type II, The allowable increasing level of noise in the assessment scope is 3dB (A) or below (excluding 3dB (A)), and the affected population is not very large.
Surface Water	III	Emissions of wastewater in this project are mainly from livestock households, nut, konjak, ramie, provender mill and slaughter house, and pollutions are mainly caused by breeding industry. According to Technical Guidelines for Environmental Impact Assessment • Water Environment（HJ/T2.3-93）, the quantity of wastewater effluent is less than 1000m3/d; pollutants are non-persistent; The number of water quality parameter is <7, the complexity of wastewater quality is “simple”, thus the assessment level is III.
Underground Water	III	Impacts on the underground water are resulted from breeding, irrigation and fertilization. Underground water will not be used in the project. According to Technical Guidelines for Environmental Impact Assessment • Underground Water Environment（HJ610-2011）, the project is type Ⅰ construction project, and the Vadose antifouling performance is “medium and strong”; the contaminated aquifer characteristics in project construction site is "medium"; Project areas will be located in the places without the underground water supply source for life and other water sensitive areas, the sensitive degree is “ not sensitive”; the amount of wastewater emission is “small”; the complexity of water quality is “simple”, thus the level is III.
Air	III	The project is concerned with roads and breeding programs, which will result in automobile exhaust pollution and odor pollution. Country roads are low grade roads below the level 4; breeding refers to household breading. According to HJ2.2-2008, the Pmax<10% or D10% <the closest distance of pollution from factory boundary. Atmospheric environment impact is evaluated as level III.

1.4.3 Assessment factors

1. Identification of environmental factors

See a comprehensive identification of environmental factors of Figure 1.4.3-2 below according to the project and the environmental characteristics of the region.

Figure 1.4.3-2 Comprehensive Identification of Environmental Factors

Period		Projects	Possible Environmental Impact	Impact Factors
Construction Period		Construction Site Layout and Shortcut Building	●Disruption to residents and traffic ●Dust, muddy roads and the influence on air quality and landscape ●Earthwork spoil loss. ●Disruption to the life and work of residents.	Ecological Environment Atmospheric Environment Water Environment Sound Environment Social Environment
		Rural Road Construction	●Causing noise, dust, waste water, solid waste. ●Impact on environment through land occupation, spoil discarding, sidewalk construction.	Ecological Environment Atmospheric Environment Water Environment Sound Environment Social Environment
		Building for factories, farmers markets, cooperatives.	●Impact on environment through land occupation, spoil discarding, sidewalk construction. ●Causing noise, dust, waste water, solid waste.	Ecological Environment Atmospheric Environment Water Environment Sound Environment Social Environment
		Breeding Base and Planting	●Destruction of arable land and vegetation ●Soil erosion	Ecological Environment Water Environment
Operating Period	Disadvantages	Rural Road	●Noise and vehicle exhaust gas	Atmospheric Environment Sound Environment
		Factory for Crop Processing, Farm Market	●Impact of emission, noise, wastewater, solid waste, etc.	Ecological Environment Atmospheric Environment Water Environment Sound Environment Social Environment
		Breeding Base and Planting	●Water pollution caused by pesticides, fertilizers and plastic sheeting.	Ecological Environment Water Environment Soil
		Livestock and Poultry Breeding	●Livestock manure and other pollution problems ●Impact on grassland needs through breeding ●Odor impact	Ecological Environment Water Environment Soil
	Advantages	Rural Road	●Improve regional transportation conditions for residents to travel and work, optimize rural structure. ●Improve the regional investment environment conducive to sustainable development.	
		Building for factories, farmers markets, cooperatives	●Initial processing of crops and the increasing of farmers' income	
		Breeding Base and Planting	●Change the status of crops constitute, increase farmers' income ●Optimize the current farming method, reduce environment pollution and other impacts on environment	
		Livestock and Poultry Breeding	●Provide organic fertilizer with good quality for farmers ●Optimize the structure of breeding sites, promote effective treatment of animal manure	

According to the environmental impact characteristics of the project and the environment characteristics of project-covered areas, the qualitative relationship of impacts of various environmental resources at different phases could be shown in Figure 1.4.3-3.

Figure 1.4.3-3 Identification of Project Environmental Impact Assessment and Screening of Matrix

Phase	Activity	Identification of Impact Degree	Ecological Environment				Physical - chemical Environment				Socio-economic Environment			
			Landscape	Green Vegetation	Life of People	Water and Soil Conservation	Noise	Air	Surface Water	Solid Waste	Industry	Local Economy	Public Transportation	Job Service
Identification			-Ⅰ	-Ⅱ	-Ⅱ	-Ⅲ	-Ⅲ	-Ⅱ	-Ⅰ	-Ⅰ	+Ⅰ	+Ⅱ	+Ⅲ	+Ⅲ
Prophase	Construction Preparation	-Ⅲ	-2	-2	-1	-1	-1	-1	-1	-1	+1	-2	-3	-1
Construction	Factories and Offices	-Ⅲ	-2	-2	-2	-3	-2	-2	-1	-1	+3	+3	-2	+3
	Roadbed	-Ⅲ	-2	-3	-2	-3	-2	-1	-1	-1	+3	+3	-2	+3
	Land Regulation	-Ⅰ	-2	-1	-1	-3	-2	-1	-3	-1	+3	+3	-2	+3
	Transportation of Material	-Ⅰ	-1	-1	-2	-1	-2	-2		-1	+3	+3	-3	+3
Operation	Transportation	-Ⅰ	-2	-1	+3	+1	-3	-2	-1	-1	+3	+3	+3	+3
	Planting	+Ⅱ	+2	+3	+2	+3	+1	+2	-1	+1	+1	+3	+2	+3
	Breeding	-Ⅱ	-2	-1	+3	-2	-1	-2	-2	-3	+1	+3		+3
	Processing Workshop	-Ⅰ	-1		+2	+1	-2	-1	-2	-1	+3	+3		+3

Note: (1) Single impact identification: reflecting the impact of a particular environmental factors of certain engineering activities, and its impacts are labeled as the following symbols: +: favorable impact; -: adverse impact; 1: slightly affected; 2: The general effect; 3: greater impact.

(2) Integrated (or cumulative) impact identification: reflecting comprehensive impact of a particular project activities on various environmental factors, or reflecting the comprehensive impacts of certain environmental factors on all engineering activities, which are also regarded as the standards for selecting assessment factors. The impact degrees are labeled as the following symbols: Ⅰ: slightly affected; Ⅱ: general effect; Ⅲ: more significant impact.

The impacts on construction of roads, factories, office buildings caused by engineering activities are permanent, the rest of the impacts are temporary. The main environmental factors affecting the construction period are: ecological environment, water and soil conservation, social environment, water environment, acoustic environment and air environment.

The impacts on environment during the operation period will last for a long time, the main environmental impact factors are: acoustic environment, water environment, air environment, ecological environment, social and economic environment.

2. Selection of assessment factors

The environment impact assessment depends on identifying environment impacts of the project and the combination with environmental sensitivity, as well as the analysis of their mutual influences. Figure 1.4.3-4.

Figure 1.4.3-4 Assessment Factors under Environment Impact

Environment		Current Assessment Factor	Forecast Assessment Factor	Total Monitoring Factor
Acoustic Environment		Day and night equivalent sound level（Ld、Ln）	Day and night equivalent sound level (Ld、Ln）	/
Surface Water	Surface Water	pH, SS, COD, BOD_5, Ammonia Nitrogen	pH, SS, COD, BOD5, Ammonia Nitrogen	/
	Construction Site	/	pH, COD_{cr}, BOD_5, SS	/

Environment		Current Assessment Factor	Forecast Assessment Factor	Total Monitoring Factor
	Sewage			
	Batch Production Wastewater	/	pH, COD_{cr}, SS, Oil	/
Underground Water		pH, total hardness, sulfate, nitrite, CODMn, ammonia	pH, total hardness, sulfate, nitrite, CODMn, ammonia	
Atmosphere		SO_2、NO_2、PM_{10}、H_2S、NH_3	CO、NO_2、PM_{10}、SO_2、H_2S、NH_3	/
Solids Waste		Garbage, livestock and poultry manure, straw and other solid waste	Construction period: construction waste, construction workers' garbage; operation period: garbage, livestock and poultry manure, straw and other solid waste	/
Ecological Environment	Animal and Plant	Plants, terrestrial animals, aquatic creatures	Plants, terrestrial animals, aquatic creatures	/
	Use of Land	Current land using condition	Area occupation amount, land use pattern, agro-ecological	/
	Water and Soil Erosion	Erosion intensity, area and reasons	Disturbance of surface area, damaging area of water conservation facilities, soil erosion and the disadvantages	
	Soil	Current soil quality condition	Soil pollution caused by fertilization, pesticides and plastic sheeting	
	Landscape	Rural and urban landscape	Rural and urban landscape	/
Social Environment Impact		Land area, population, production value, mineral resources, tourism resources, industry, agriculture, transportation	Population size and structure, quality of life, secondary development activities, land occupation	/

1.4.4 Focus of assessment

Based on the characteristics of the project and the environment characteristics of project-covered areas, the focus of environment impact assessment is the impact on ecological environment, the impact on society and economics (see "editorial"), the assessment on land and water resources using, as well as the protection measures and management plans on ecological and water environment.

Impacts on agriculture, forest and grass industry before and after the implementation of key ecological environment project include: land using, animal and plant resource protection, ecology restoration, landscape greening measures, erosion control measures, and crops transformation.

The focuses of acoustic environment assessment are about highway traffic noise, the noise impact of processing factories on sensitive places, including forecasting impact scope, degree and taking environment protection measures.

Before and after the implementation of the project focusing on the assessment of water environment, agriculture and aquaculture water sources and the impact on surface water intake; agricultural fertilizer, pesticide use on water environment pollution.

Impacts on surface water through water using in agriculture and breeding industry before and after the implementation of the project are the key for ecological environment assessment, including: the impact on water pollution by using agriculture fertilizers and pesticides.

1.5 Environmental protection receptors

The overall environmental objective of the project is to protect and improve the implementation of ecological agriculture and rural environment, improve rural land resource utilization, and promote a virtuous cycle of agro-ecosystems and sustainable rural development. Considering the content and field of the project, the specific objectives are as follows

1. Environmental quality control objectives

(1) Ambient air: protecting the atmospheric environment within the area of construction projects to meet the secondary standard of "Ambient Air Quality Standard" (GB3095-1996).

(2) Noise: ensuring the sound quality of the environment surrounding the projects to meet the secondary standard of "Acoustic Environmental Quality Standards" (GB3096-2008).

(3) Water Environment: ensuring the quality of both surface water and groundwater in the project area won't be less than the current level due to the construction and operation of the project.

(4) Ecological control objectives: maintaining the ecological balance of the region and the integrity of the ecosystem to prevent damage of the ecological environment and degradation of ecological functions.

2. Pollution control standards

(1) To properly settle down the problems caused by the project on the society, economy and environment and make sure the environment within the project area can meet the functional requirements of the environment.

(2) To control soil erosion due to the destruction of vegetation and soil excessive use of resources, and agricultural chemical pollution, maintain the integrity of the ecosystem, ecological balance and diversity as well as protect the rare and endangered species and ancient woods with great value.

(3) To control the emissions of noise, waste water and solid waste during the construction and operation period, and protect the air, sound and water in the surrounding environment.

(4) To meet the planting and aquaculture planning of agriculture, forestry, animal husbandry and protect the farmland, woodland and grassland in the protected areas.

(5)To respect local customs in ethnic minority areas, and protect minority activities, nature reserves, drinking water source, scenic areas, heritage areas, world heritage sites and forest parks from destroy.

2. PROJECT DESCRIPTION

2.1 General goal and total investment of project

2.1.1 Project goal

Through the implementation of "Guizhou Rural Development Project With the Help of the Loan From World Bank", to remarkably increase the income of poor households in project area, to promote the production technology and self-development ability of farmers, to initially shape the superior industry by perfecting and adjusting the agricultural production structure, and to further develop the farmer

cooperative economy organization, making farmers' cooperative society as the main power of driving agriculture industrialization development. At the same time, the project shall also improve the living standard fundamentally in the project are, enhance the environment protection, complete the public service system, and lay a solid foundation for a comprehensive well-off society by 2020, and the basic elimination of poverty.

2.1.2 Project investment and source of funding

The project's total investment and the source of founding: The total project investment is 857.14 million RMB, including 600 million RMB loan from the World Bank with 70% of the total project amount, and 257.14 million RMB domestic funds with 30% of the total amount. The investment in recombination and modernization of agriculture's pillar industry is 364.77 million RMB, taking up 42.5% of the whole, the investment in public infrastructure and service support subproject is 340.33 million RMB, taking up 39.70%, the investment in training and ability development subproject is 68.35 million RMB, taking up 7.97%, the investment in project management, monitoring and evaluation subproject is 21.35 million RMB, taking up 2.49%, and the investment in "Three cost" is 62.34 million RMB, taking up 7.27%. See details in Chart 2.3-1

2.2 Project components and implementation scheduling

2.2.1 Project components

（1）Subproject for recombination and modernization of agriculture's pillar industry

To complete the construction of production demonstration base of tea, Chinese medical herbs, potato, edible mushroom, fruit and vegetables, and construction of standard breeding demonstration base of goat, chicken, pig, etc., and to complete the construction of processing plants for tea, walnut, hot pepper, konjac and other agricultural products. To establish a group of rural specialized cooperatives, forming agricultural production operating organizations, auch as "cooperative+base+households", and "enterprise+ cooperative+ households", and through the implementation of industrialized anti-poverty projects to make the project area per capita net income increase apparently higher than the provincial level.

（2）Infrastructure and service support subproject

Centering on the major industry's' development in the project area, to complete the construction of supporting industries, such as roads, irrigation, drainage, electricity, telecommunication, etc., building up a group of agriculture trading centers,

agriculture markets, and cold chain storage warehouses with a certain scale, and to perfect the agricultural technology extension, information service, financial service and public service system, which supports the whole development of the industry.

(3) . Training and ability development subproject

The project plans to complete practical technology training for 120 thousands of farmers, helping each household in poverty acquire 1-2 practical technologies, to complete 29 thousands of technical backbones' training for poverty alleviation and 85 hundreds of cooperative administrative staff's training for industry management, and to complete 700 administrative personnel's training targeting at project implementation and ability development, cultivating a team of management backbones for poverty alleviation.

(4) . Project management, monitoring and evaluation subproject

To set up management organizations of "Guizhou Rural Development Project with the Help of the Loan From World Bank" in every province, city, county and village, establishing corresponding management, monitoring and evaluation mechanism, formulating an effective management system, and developing a monitoring and evaluation index system. To equip corresponding devices in the work place, and purchase every kind of office equipment with 141 sets, such as computers, and 12 engineering vehicles.

2.2.2 Implementation scheduling

This project, applying for on the list of the 2013-2015 Aid Program of Rolling Development for China by World Bank, with total investment for 857.12 million RMB, shall be completed in 5 years from 2014-2018. However, according to the economic development speed of China, we shall strive to complete the project in 3 years, strictly observing the project scheduling and investment plan, and to withdraw and pay the loans in accordance with the World Bank's regulation and project scheduling after acceptance inspection.

2.3 Major content and scale of the project

Major content and scale of the project (details seen in table2.3-1). Distribution of the project(details seen in attached Pictures 2.3～2.3-11)

Table 2.3-1 List of World Bank investment in rural development projects in Guizhou

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
		Total		85714	100
	Ⅰ	**Restructuring and modernization of rural pillar industry**		36477	42.56
	(I)	**Standardized, large-scale production**	Breed improved varieties in 31 industries of the whole project area, change sporadic, non-technical breeding habits, and create standardized, large-scale production.	26084	
Buchan County	1	Guizhou white goat breeding	Build 22400m² of standardized sheep pen, 8960m² of playgroung,1400m^3 of silage pool, 2205 acres of artificial grassland,1400m^3 of reservoir, 1400m^3 of pool of sheep dung pile，purchase 280 straw chaff cutter, 5600 fine ewe breed，280 ram breed and distribute to 180 households， 20-50 per household.	2262.61	
	2	Tea plantation	Build 1,500 acres of new eco tea plantations, plant 9,000,000 (6,000 / acre) tea trees, use 2250 tons of organic fertilizer, install 30 units of solar insecticide lamp (1 unit / 50 acres), plant 21000 osmanthus (14 / acre) and ditch 150 acres of land.	913.2	
Daozhen County	1	Standardized vegetable production	Build 2000 acres of vegetable demonstration garden in Datang Village in Luolong and four greenhouse nursery NC shed (steel structure and CNC equipment), ranging 5120m². Buy solar insecticide lamp, rotary tiller, motorized sprayers, yellow sticky boards for pest control, fertilizers and get pollution-free vegetable production area certification and product certification as well as registered trademark of organic vegetable.	435.2	
	2	Standardized radix scrophulariae production	Plant 5000 acres of radix scrophulariae and buy seeds and fertilizers.	200.00	
	3	Standardized Codonopsis pilosula production	Plant 5000 acres of Codonopsis pilosula and buy seeds and fertilizers.	220.00	
	4	Standardized Honeysuckle	Plant 5000 acres of Honeysuckle and buy seeds and fertilizers.	200.00	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
		production			
	5	Standardized Taxus cuspidata production	Plant 5000 acres of Taxus cuspidata and buy seeds and fertilizers.	500.00	
Zheng'an County	1	Tea garden construction	Newly plant 540 acres of white tea standardization demonstration field, buy tea tree, base fertilizer (manure), fertilizer (organic fertilizer), shelter (Osmanthus fragrans), solar insecticide lamp, armyworms plate, anti-grass cloth, botanical pesticides, bio-pesticides , sprinkler irrigation facilities.	622.1	
	2	Tea garden renovation	Carry out renovation on 2,000 acres of organic tea garden, buy fertilizer (organic fertilizer), shelter (Osmanthus fragrans), solar insecticide lamp, armyworms board, botanical pesticides, bio-pesticides.	666.0	
	3	Walnut plantation	1500 acres of high standard walnut planting, 3,000 acres high grafted walnut, buy walnut seedlings, cuttings collection, base fertilizer (manure), fertilizer (special fertilizer), pruning shears, etc.	621.85	
	4	Bletilla plantation	500 acres of new Baiji demonstration plantation, buy seedlings Baiji, base fertilizer (manure), fertilizer (manure), drip irrigation facilities, etc.	329.0	
Dejiang County	1	Gastrodia elata plantation	Plant 95227 m² of gastrodia, of which Shaxi Township plants 35000 m², Fengxiangxi Town 7000 m², Gaoshan Town 29246 m², Quankou Town 5 000 m², Changfeng Township 5 000 m², Yantang Township 3981m², Hexing town 10,000 m². Buy Gastrodia Elata seed, mushroom seed and fungi timber, etc.	990.36	
	2	Walnut plantation	Plant 13153 acres of walnut, of which Shaxi Township plants 1250 acres，Fengxiangxi Town 1653 acres，Gaoshan Town 2500 acres，Quankou Town 2500 acres，Changfeng Township 2500 acres，Yantang Township 1750 acres，Hexing Town 1000 acres. Buy seeds, sprayers, pesticides, fertilizers, etc.	683.96	
	3	Virus-free potato plantation	Plant 10667 acres， of which Shaxi Township plants 1500 acres，Fengxiangxi Town 1500 acres，Gaoshan Town 1500 acres，Quankou Town 1500 acres，Changfeng Township 1500 acres，Yantang Township 1667 acres，Hexing Town 1500 acres. Buy potato seeds, insecticide lamp，sprayers, pesticides, fertilizers, etc.	597.36	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
Yanhe County	1	Hollow plum plantation	Build 5000 acres of standardized plum garden and renovate 5000 acres of plum garden. Buy seeds, fertilizer, phosphate fertilizer, solar insecticide lamp, sticks scissors, serrated, biological pest control agents, yellow plate and technical guide for new orchard cultivation and renovation.	670	
	2	Fine sheep breeding	Conduct seed breeding (put 570 ram, and 10380 ewes), plant 4400 acres of artificial grass, 2,300 acres of high quality forage, and other construction sheepfold of 15840m². Of the 300 households in 19 village involved, distribute 20-50 sheep per household.	991.24	
	3	Black peach plantation	Build 7800 acres of standardized orchard. Buy quality grafted seedlings, organic fertilizer, biological pest control agents, yellow plate and orchard cultivation techniques and new guidance.	347	
Sinan County	1	High quality plum plantation	6000 acres. Buy seeds, fertilizers, pesticides, solar insecticide lamp and pruners, pruning saws and pruner.	672	
	2	High quality grape plantation（rain-shelter-cultivation)	4,000 acres of high-quality grape base (rain shelter cultivation). Buy seeds, fertilizers, pesticides, pruning scissors, pruning saws, pruner, solar insecticide lamp, cement columns, # 8 wire, bamboo slice and films, etc.	2400	
	3	High quality honeysuckle standardized production	2000 acres. Buy seed, fertilizer, pesticide, pruner and solar insecticide lamp, etc.	152.00	
	4	High quality Codonopsis pilosula standardized production	2000 acres. Buy seed, fertilizer, pesticide, pruner and solar insecticide lamp, etc.	249.00	
	5	High quality Pseudollaria heterophylla standardized production	1000 acres. Buy seed, fertilizer, pesticide, pruner and solar insecticide lamp, etc.	222.00	
Yinjiang	1	Edible mushroom	Plant 6,000,000 stick mushroom, buy mushroom production facilities and so on; build 100m² of	1314.38	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
County		production	Sterilization chamber, 9000m² of greenhouse; buy sawdust, straw, oatmeal, sugar, gypsum powder, bacteria, fungus bag, coat pocket, snap, 95 % alcohol, fuel sterilization, disinfection drugs, other raw and supplementary materials and pay the electricity bills.		
	2	Green-shelled-egg chickens cultivation	Buy 90000 egg chickens， built 9000m² of pens and buy chicken feed, vaccination doser, supporting cages, chutes, 300 disinfection tanks, motorized sprayers, ventilation equipment, automatic waterers, 300 sets dung cleaner, and hydroelectric facilities. Of the involved 300 households, distribute 200-300 chicken per household.	886.34	
	3	Walnut plantation	Plant 7500 acres of walnut. Buy walnut seedlings, manure, P and K fertilizer (walnut special fertilizer), ABT rooting powder, bio-pesticides (nontoxic), mulch, spray, fruit pruners, pruning saws and movable pumps.	604	
Shiqian County	1	Virus-free potato plantation	Plant 3900 acres. Buy seed, fertilizer, organic fertilizer, pesticides, lure aphids yellow plates, land costs, solar insecticide lamp, motorized sprayers, tractors and rotary tiller	628.63	
	2	Ophiopogonis seed production	1000 acres. Buy 80000 Ophiopogonis seedlings/acre, fertilizer, power sprayer, tractor and rotary tiller.	572.04	
	3	Salvia miltiorrhiza seed production	2000acres，Salvia miltiorrhiza seed 5kg/acre，fertilizer, power sprayer, tractor and rotary tiller.	213	
	4	Layer hen cultivation	Buy 50000Layer hen，build 5 chicken houses of 1250m²，150 hen cultivation households，renovate 13750m² of pen and buy 250，000 chicken vaccine.	910	
Nayong County	1	Tea garden construction	Build 6000 acres of tea garden，plant 4000 tea trees per acre，mechanical trenching of 6,000 acres, apply 500kg fertilizer per acre， buy 120 solar insecticide lamp (per 50 acres).	912	
	2	1500 acres of Pueraria standardized plantation	1500 acres of Pueraria standardized plantation，of which 600 acres in Weixin Town and 900 acres in Guangming Village. 4070 yuan/acre.	610	
	3	1500 acres of Platycodon grandiflorus standardized	1500 acres of Platycodon grandiflorus standardized plantation in Gaofeng Village, Kunzhai Township，2020 yuan/acre.	303	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
		plantation			
	4	Nuogu pig cultivation	Farmers raise 2000 pigs. 200 households raise 10 Nuogu pigs each. Plant 2 acres per household forage species, purchase 2t forage maize, 1 chaff, epidemic prevention drugs 100 yuan / head and build standard sheds of 20 m², septic tank of 5m3 per household.	852	
	5	Ramie plantation	Plant 2000 acres of ramie. Purchase ramie seed, fertilizer and solar insecticide lamp.	474	
Hezhang County	1	Konjak standardized plantation	Build Konjac plantation of 1500 acres and cultivation of 1500 acres. Purchase seed, fertilizer and solar insecticide lamp.	1000	
	2	Virus-free potato plantation	Build 3000 acres of potato plantation. Purchase seed, fertilizer, pesticide and land management.	150	
	3	Walnut standardized plantation	Seedlings, grafting cuttings procurement, grafting, fertilizer and pesticide costs, walnut Scion construction of 500 acres, 500 acres of low-yielding improved walnuts.	140	
Weining County	1	Potato field plantation project	Plant 10000 acres of early-ripe Favorita potato. Purchase seed, fertilizer, pesticide and land management.	600	
	2	Layer hen business	8 standardized laying hen house, each with 30,000 laying hens in coop. A total of 160 households build laying house of 911m² per 20 households cooperative, each of 45.55m², breeding 1500 hens. Buy chicks, coop, feed, pharmaceuticals and vaccines.	369.4	
	3	Konjak plantation	New flower Konjac - Ⅱof 700 acres. Buy organic fertilizer 800t, mainly human and animal manure, corn stalks and straw.	600	
	(Ⅱ)	**Industrial value-added (processing) subproject**		5651	
Daozhen County	1	Vegetable testing machine	1 Pesticide residues in vegetables detector (including agents).	0.8	
	2	Chinese herbal medicine industry value added	Establish 4 effective herbal ingredient testing center.	400	
Zheng'an	1	Tea product	1 product inspection and testing equipment. Purchase 2 green tea cleaning processing equipment.	520	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
County		Inspection and testing and processing facilities			
	2	Walnut processing equipment purchase	Purchase 1 set of walnut drink processing facility for "Zheng'an County annual processing of 1000 tons of walnut oil 500 tons of walnut powder 1000 tons of snack feed project"（This item has been approved in table 2.5-1）	250.5	
Yanhe County	1	Hollow plum Industries preservation system	Preservation room, library body insulation systems, storage equipment (2000t), electrical systems, testing equipment, automatic classification of fruits pipeline and other constructions.	196.2	
	2	Goat feed industry supporting systems	Environmental batching system, detection systems and other construction，30000t.	281.26	
Yinjiang County	1	Edible mushroom industry	5 sets of bagging machinery and equipment, 4 auto-inoculation machines, 10 automatic vaccination machines, 1000m² of fresh frozen library, 2 sets of scales.	436	
	2	Walnut industry	Purchase 2 green walnut peeling machines, walnut oil moisture detector, biological electron microscopy, Lovibond colorimeter, gas chromatography and SFC thermostat system for "Yinjiang County annual production capacity of 10,000 t walnut processing project"（This item has been approved in table 2.5-1）.	93	
Shiqian County	1	Chinese herbal medicine testing equipment	33 testing machines.	220.11	
	2	Organic fertilizer of processed chicken dung plant construction	800m² of plants，100,000t of chicken dung organic fertilizer annually.	80	
	3	Chicken processing plant construction	500m² of eliminated chicken processing plant, 500m² of new egg warehouse, 500m² of hens feed factory processing plant.	75	
Nayong	1	Tea processing plant	2 sets of green tea processing facilities in Guiming Tea Limited Company in Nayong County	131	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
County		Construction	Guizhou Province.		
	2	Nuogu pig slaughterhouse	Build 1300m² of slaughtering, freezing workshop; slaughterhouse floor hardening of 1000 m², slaughter prep plant of 200 m², slaughter plant of 200 m², acid cleaner plant of 200 m², division workshop of 300 m², freezing workshop of 400 m², Tank of 400 m3, sewage treatment facilities of 400 m3, a set of mechanical slaughter, one set of division equipment, one set of refrigeration system. The slaughterhouse has 2000 Nuogu slaughtered pigs per year, built in Zhuchang Township Nayong County and is in the "Planning of small slaughtering point in Nayong County" and is one of the small slaughtering points for live pigs in the county.	600	
	3	Puerariae processing	Purchase one set of puerariae slice cleaning device, starch production facility, mill and packaging machine.	221	
	4	Platycodon grandiflorus processing	Build a bellflower processing room of 100m² and purchase one set of processing machine.	37.4	
	5	Ramie processing	Expand needlecraft manufacture plant of 1000m², purchase or make hand-loom for 400 sets	160	
Hezhang County	1	Konjak early processing plant	5 new konjak early processing plants, each of 100m²; 5 storage rooms, each of 200m ²; purchase washing machine, dryer, sets of slicing machine, one processing plant, storage room and a set of processing equipment for Kele Township, Caishen Township, Fuchu Township, Shuitang Township and Zhuming Township.	439	
	2	Walnut oil deep processing project	Buy 8 sets of crude oil cold pressed system, 2 sets of filling system,3 sets of high pressure air compressor system, 2 sets of low pressure air compressor system, two sets of oil-free air compressors for the "Annual production of 1.5 million kilograms of walnut oil and 2 million walnut powder processing projectin Hezhang County Bijie City". (The project is commissioned by another qualified environmental impact assessment unit and is no longer within the scope of this evaluation)	694	
	3	Potato industry project	Each cooperative build a storage room, each of 300m² for all three; each cooperative build a transition shed, each of 500m² for all three.	195	
Weining County	1	Layer hen cultivation garden project	Build 1,000m² of organic fertilizer plant, processing 4800t organic fertilizer; process 8362t of feed per year; build 400m² egg cleaning and graded packaging workshop.	180	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
	(Ⅲ)	**Professional Farmer Cooperatives Construction**	Build 108 cooperatives, each taking 100m², with a total area of 10800m²; equipped for each cooperative desktop computers and printers, copiers, office furniture, cabinets, etc. The total amount is 108 sets; provide project guidance, set 2 counselors for each industry and all the 61 counselors will train and operate the cooperative. Of all 108 cooperatives, 7 are in Wuchuan County, 9 in Zheng'an, 6 in Daozhen, 12 in Nayong, 9 in Hezhang, 6 in Weining, 12 in Yinjiang, 7 in Yanhe, 9 in Shiqian, 10 in Sinan and 21 in Dejiang.	3086.2	
	(Ⅳ)	**Market development**	Market development and research. Improve quality, brand and recognition, promote brand and ensure feed security.	837	
	(Ⅴ)	**Industry operating risk prevention**	Buy agriculture insurance in all industries to prevent market risks and natural disaster risks.	819	
	Ⅱ	**Public infrastructure and services support**		34033	39.70 %
	(Ⅰ)	**Production of road**		29204.67	
	1	Industrial road	For industrial sidewalk in rural area and in processing and marketing, we build 446.85km with width of 4.5m, cement concrete surface.	22343	
Wuchuan County	(1)	Industrial road 44.9km。	5.2km from Longdeng group to Fenghuo group in Niutang Village, 1km from Niutang group to Niutang Yakou， 5.7km from Xiongjiaping group to Xinchang Elementary School in Xinchang Village, 2.5km from Xinchang gate to Shuiyangxi grou, 3km from Xinchang gate to Qinggnagyuan group, 2.1km from Qingtai group to Zhongziyuan group in Tian Village, 17.64km from Gaodong to Lianshan to Gaofeng， 6.26km from Wangjiabao to Sanchakou to Chanyuangou and Pingshang, 1.5km from Tujigang to Yanjiaping.	2245	
Daozhen County	(1)	Industrial road 68.8km	13.00km from Dagan Village to Huangjiacao， 10.40km from Wu Village to Xintian， 10.80km from Yuxi Town to Hongguanya，16.20km from Hongguanya to Xiangyuanzi，9.0km from Lianchi Village to Huayuan， 3.00km from Taiyangping to Dashuijiang, 6.4km from Yangba	3440	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
			Village to Chengmendong.		
Zheng'an County	(1)	Industrial road 24.15km	4km in Tuping Town, 4km in Lejian Township, 6km in Jianping Township，10.2km in Gelin Township.	1207.5	
Dejiang County	(1)	Industrial road 43km	6km from Shujiazhai to Dayan， 3km from Majia in Xuanxi Village to Longdongwan，3km from Yanmen in Lengxi Village to Fenghuangshan， 5km from Shuitang Vilage S303 to Meijia， 18km from Xianjin Village in Changfeng County to Xiaoya， 3km from Louqinglaozhai to Shishuya in Yantang Township、3km from Xianfengdaluwan to Jingtouba,2km from upstream of Minzhu to downstream.	2150	
Yanhe County	(1)	Industrial road 18km	1km from Zhangjiaba to Daba in Shazi Town, 1km from Lianglongba to Zhifangping；3km from Zhongjieba to Sunjia in Heba Village in Zhongjie Township；6km from Shilaohu to Heba to Lizi in Zhongjie Township；1km from Xiaojing to Yangcha road in Xiaojing Township, 1km from Hejiapo to Yangjiawuji；3km from Laomulin to Shangyangzhai to Longjia in Guanzhou Town；2km from Hujiaba to Heduimen in Qiaojia Town.	900	
Sinan County	(1)	Industrial road 10km	3km from Xiaoxiqiao to Lishuwan in Tangtou Town,2km from Shaba Elementary School back to Zhulinwan；2km from Zengjiapo to Diaoshuijing, 3km from Haojiacunwan to Daba.	500	
Yinjiang County	(1)	Industrial road 41km	12km from Shanmen to Yanshang in Shapozi Town；12km from Zhuyuan to Yanshang in Shapozi Town；6km from Duimen to Yanjia；11km from Raojia to Hejia.	2050	
Shiqian County	(1)	Industrial road 50.5km	8km in Pingshan Township,8km in Shigu Township,9km in Huaqiao Town, 8km in Longjing Township, 12km in Tangshan Town.	2525	
Bijie County					
Nayong County	(1)	Industrial road 29km	8km from Gelaozhai to Haizitangbian to Qiangjiao in Shikai Township；6km from Baijia in Fanrong Village to Majiayakou in Yangchang Township；4km from Qiangshang to Qiuhuzhai to Houcao to Yibazhai in Guoquanyan Township； 4km from Zhangjiazhai to Qinggangpo to Zhangjiayakou to Daqiaobian in Weixin Town； 5km from Liangshuijing to Shangzhaizu to	1450	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
			Xiazhaizu to Sixin in Kunzhai Township；2km from Miaobaobao to Luojiazhai in Longchang Town.		
Hezhang County	(1)	Industrial road 42km	6km from Baimacang to Sujiahaizi in Caishen Township；6km from Kelelaojie to Yanheqiaobian in Kele Township；6km in Liaojiagou to Matang in Fuchu Township；6km from Hanqiao to Guanshan in Shuitang Township；3km from Daoshibei to Laolaishan crossroad；6km from Shuijingzu to Huamiaozhai in Songlin Township；3km from Xinying to Songlinchangba in Kele Township；6km from Yuanzi to Wanjiao in Zhuming Township.	2100	
Weining County	(1)	Industrial road 76km	16km in Longmen Township，22.5km in Longhcang Town，15km in Heituhe Township，22.5km in Xinfa Township	3800	
	2	Production sidewalk	Build 351.18km of production sidewalk with a width of 3.5m and cement concrete surface.	2809	
Wuchuan County	(1)	Production sidewalk 7.85km	Build 7.85km of sheep pen production sidewalk from Yangchanye road to artificial grassland. 2km in Guangzhuangpianqu in Niutang Zhuang, 1km in Xiongjiawan, 0.5km in Xiaoyangxi,2km in Qinggangyuan，1km in Gaotai in Fengle Village，0.6km in Zhaochiba，0.75km in Qingtai in Tian Village	62.8	
Zheng'an County	(1)	Production sidewalk 48.83km	30km in Lejian， 15km in Tuping， 3.83km in Gelin	390.64	
Dejiang County	(1)	Production sidewalk 15km	7km in Shaxi Township 8km in Gaoshan Town	120	
Yanhe County	(1)	Production sidewalk 125km	Build production sidewalk of 125km for five project towns with hollow plum industry, goat industry and walnut industry.	1000	
Sinan County	(1)	Production sidewalk 47.5km	Tangtou Town 11km，Banqiao Town 10km，Silin Town 8km，Yingwuxi 8.5km，Daheba Township 6km，Liangshuijing Town 4km.	380	
Nayong County	(1)	Production sidewalk 13km	10km in tea garden，3km in ramie plantation.	104	
Hezhang County	(1)	Production sidewalk 94km	Caishen 15km、Kele 18km、Fuchu 15km、Shuitang 2km、Zhuming 29km、Songlin Township 15km.	752	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
	3	Tractor road	80.77km，with a width of 1.5m,cement concrete surface.	2423	
Zheng'an County	(1)	Tractor road 23.5km	Lejian 10km，Tuping 8.5km，Jianping 2km，Gelin 3km.	705	
Dejiang County	(1）	Tractor road 21km	7km in Quankou Town, 7km in Yantang Township,7km in Hexing Town	630	
Yanhe County	(1)	Tractor road 14km	Build tractor road of 14km for five project towns with hollow plum industry, goat industry and walnut industry.	420	
Sinan County	(1）	Tractor road 8km	2km in Tangtou Town, 5km in Banqiao Town, 1km in Daheba Township.	240	
Shiqian County	(1）	Tractor road 3km	3km in Yibi Village Shigu Township.	90	
Nayong County	(1）	Tractor road 7km	7km in herb platation in Kunzhai Township Weixin Town.	210	
Hezhang County	(1）	Tractor road 4.27km		128	
Weining County	(1）	Tractor road 3km			
	4	Field trail (sidewalk)	Build 404km field trail with a width of 0.8m and cement concrete surface.	1630	
Daozhen County	(1）	Field trail 35km	Build sidewalk trail of 30km in vegetable base in Datang Village and 5km in Codonopsis pilosula base.	140	
Zheng'an County	(1）	Field trail 15.41km	Build sidewalk trail 11.28km in 2 walnut demonstration area，Jianping 5km，Gelin 6.28km；Baiji demonstration area 4.13km.	61.63	
Dejiang County	(1）	Field trail 35km	Shaxi Township 5km、Fengxiangxi Town 5km、Gaoshan Town 5km、Quankou Town 5km、Changfeng Township 5km、Yantng Township 5km、Hexing Town 5km.	140	
Yanhe County	(1）	Field trail 243km	Build sidewalk trail of 243km for five project towns with hollow plum industry, goat industry and walnut industry.	972	
Sinan	(1）	Field trail 69km	Tangtou Town 14km、Banqiao Town 15km、Silin Township 12km、Yingwuxi 13km、DAheba	276	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
County			Township 8km、Liangshuijing Town 7km.		
Nayong County	(1）	Field trail 10km	10km of herb field trail in Kunzhai Township Weixin Town.	40	
	(Ⅱ)	**Industry supporting infrastructure**		1145.9	
	1	Industrial area irrigation and drainage facilities	Build 846 tanks.	1100	
Wuchuan County	(1）	Tank	Build 6 500m^3 tanks.		
Zheng'an County	(2）	Tank and diversion channel	Build 12 4000m^3 tanks and ditch.		
Sinan County	(3）	Tank	Build 71 30m^3 tanks and 51 50m^3 tanks.		
Shiqian County	(4）	Tank	Build 51 50m^3 tanks (with settling pond and ditch）		
Nayong County	(5)	Tank	Build 400 3m^3 tanks and 300 10m^3 tanks.		
Hezhang County	(6)	Tank	Build 8 40m^3 tanks		
Weining County	(7）	Tank	Build 4 tanks of Konjak plant and irrigation, each of 250m^3.		
	2	Public market facilities, power supply and other necessary infrastructure		46	

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
Wuchuan County	(1）	Sheep dung pile transit pool	Build 5 sheep dung pile transition pool， each of 100m². Niutang Village has one, Xinchang Village has one, Fengle Village has one, Chaping Village has one and Tian Village has one.		
Shiqian County	(2）	Electricity supply system	Build 2100m of electricity supply system covering 1600m of virus-free potato industry(1000m in Yibi Village Shigu Township and 500m in Fenghuangtun Village Pingshan Township) and 500m of Chinese herb industry(Laozhai Village Pingshan Township).		
	3	Agricultural market, farmers market	Build 18 new farm products trade market for industry development.	3551	
Zheng'an County	(1)	6	Build a 300m² Tea-trading market in Lejian Village and Liaoyuan Village; build a 300m² Tea-trading market in Linxi Village and Mingxing Village in Tuping Town; build a 250m² walnut market in Fengguang Village, Gelin Town and Jianping Township.		
Yanhe County	(2）	3	Sand Hollow Plum Industrial Market: Proposed land of 2000m², the new steel concrete frame structures, greenhouses, eight farm building facades, each of 4 × 8 m², proposed booth of 30. Goat Market in Zhongjie: the proposed land of 1800m², the new steel concrete frame structures, greenhouses, 6 farm building facades, each of 4 × 8 m², proposed booth of 20. Xiao Jing Goat Market: Proposed land of 1,000 m², the new steel concrete frame structures, greenhouses, 5 farm building facades, each of 4 × 8 m², proposed booth of 10.		
Sinan County	(3)	1	Trade market in Tangtou Town Sinan County: Construction management space of 300m², 3,000m² of simple transaction greenhouse, roads, parking lots of 2000m², 800m² of simple packaging workshop, cold storage of 500m², one set of cold storage equipment.		
Yinjiang County	(4）	2	Muhuang Market: Market steel truss structure sheds of 840m², 350m² of market trading stalls, markets hardened ground of 840m², 210m² market sewage drainage ditch, garbage collection and disposal toilet room of 70m², 560m² of parking and other markets. Xinzhai Township Dayun agricultural market: goods storage warehouse of 1050m², the market management and office space of 140m², goods yard steel truss shed of 1260m², the market parking unloading field and hardening yard of 2100 m².		
Shiqian County	(5）	1	Trade market in Xinchang Village Tangshan Town: 1500m² of trade market and one electronic trade market.		

Project Location	No.	Project Name	Project Content and Construction Scale	Total Investment (ten thousand Yuan)	Ratio（%）
Hezhang County	(6）	4	1, Build a 3000m²-konjak product trade market in Zhuming Township and Fuchu Township, each with a set of supporting electronic information scroll. 2, Build a 3000m²-potato product trade market in Kele Township and Shuitang Township, each with a set of supporting electronic information scroll.		
Weining County	(7）	2	Potato Market in Maoguan Village Caohai Town: trading house of 1200m², 2000m² of trading shed, electronic trading systems, market transactions ancillary equipment. Wholesale egg center in Caohai Town: establish one wholesale egg product center of cooperative household, 580m².		
	4	Supporting service	Government feed safety testing and control, public outreach and training services, marketing system and agricultural research and technology transfer.	131	
	Ⅲ	**Training and capacity building**	During the project implementation, in order to facilitate project implementation, project stakeholders should strengthen technical training and capacity building. There are 156,138 passengers including 119,150 farmers attending practical technical training, 28562 people attending professional poverty alleviation technicians training and 8426 people attending cooperative management stuff's industrial management training. Also, we should pay attention to the role of poverty reduction in destitute areas and enhancement of agriculture and rural development. We should improve the ability to continuously optimize the industrial investment environment and enhance governance capacity of cooperatives and the main business of industrial development, and promote the interests of industry stakeholders to form an effective mechanism for benefit sharing .	6835	7.97
	Ⅳ	**Project management, monitoring and evaluation**	For institution-building, purchase computers and other office equipment of 141 sets, 13 project engineering and other vehicles; project management, monitoring and evaluation include: training, conferences, seminars, consulting, technical assistance, management software, provincial, city and county level monitoring and management (project communication, inspection, monitoring, etc.), project acceptance, monitoring and evaluation, etc.	2135	2.49
	Ⅴ	**Three fees**	Reserve fund, construction interest fee and front-end fee.	6234	7.27

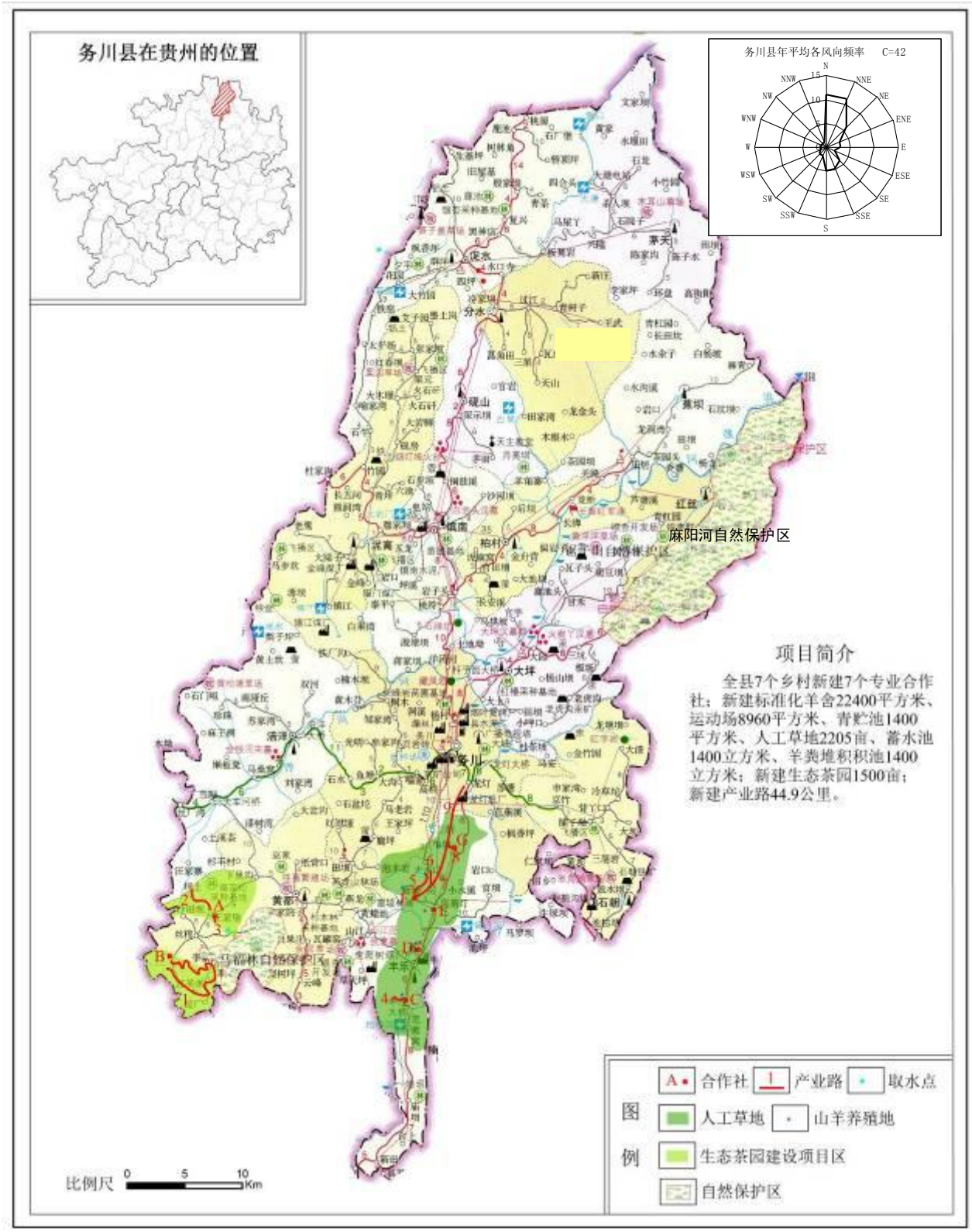


Figure 2.3-1 Project Area Distribution Diagram in Wuchuan County of the World Bank loan in Guizhou for Eural Development Project

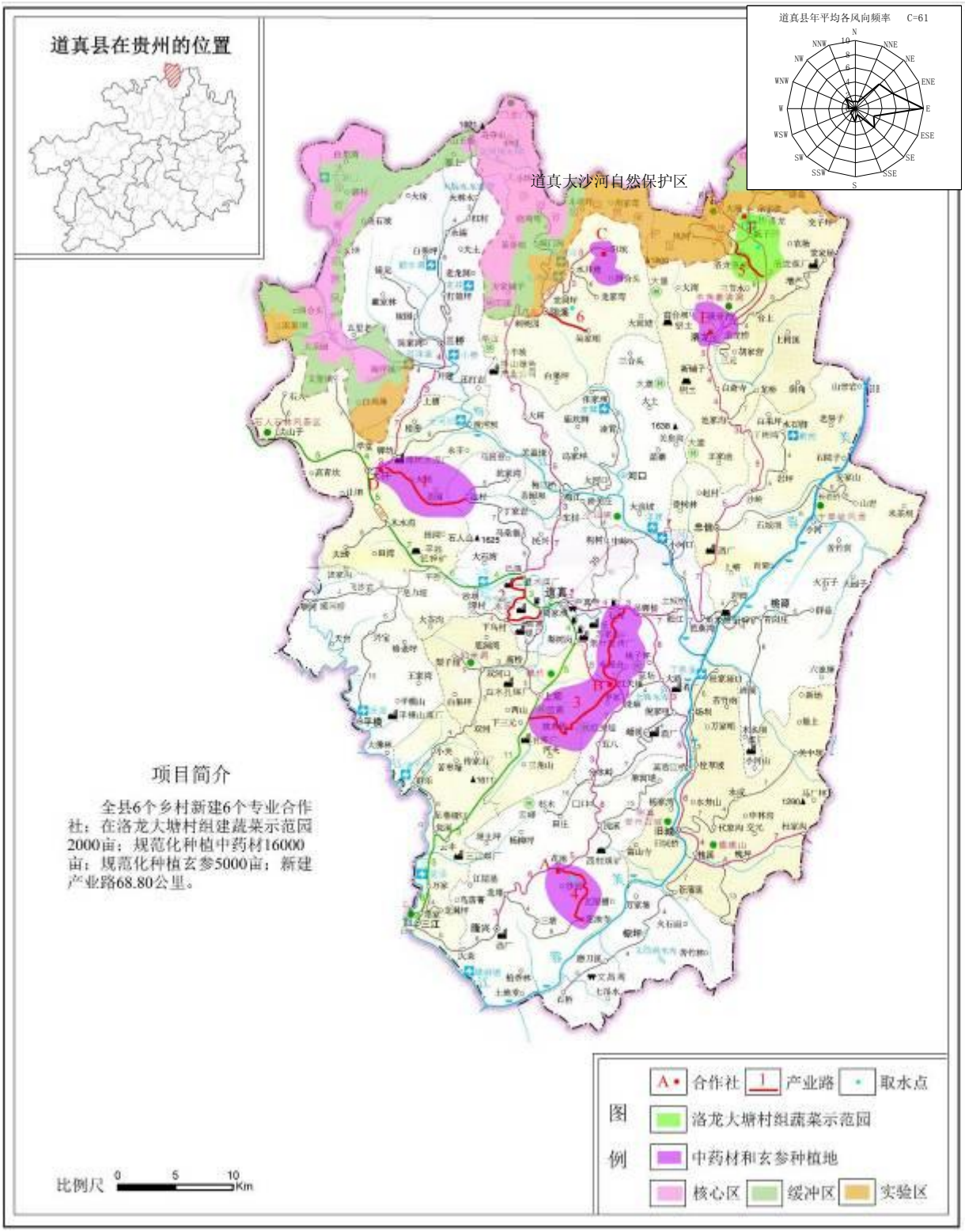


Figure 2.3-2 Project Area Distribution Diagram in Daozhen County of the World Bank loan in Guizhou for Rural Development Project

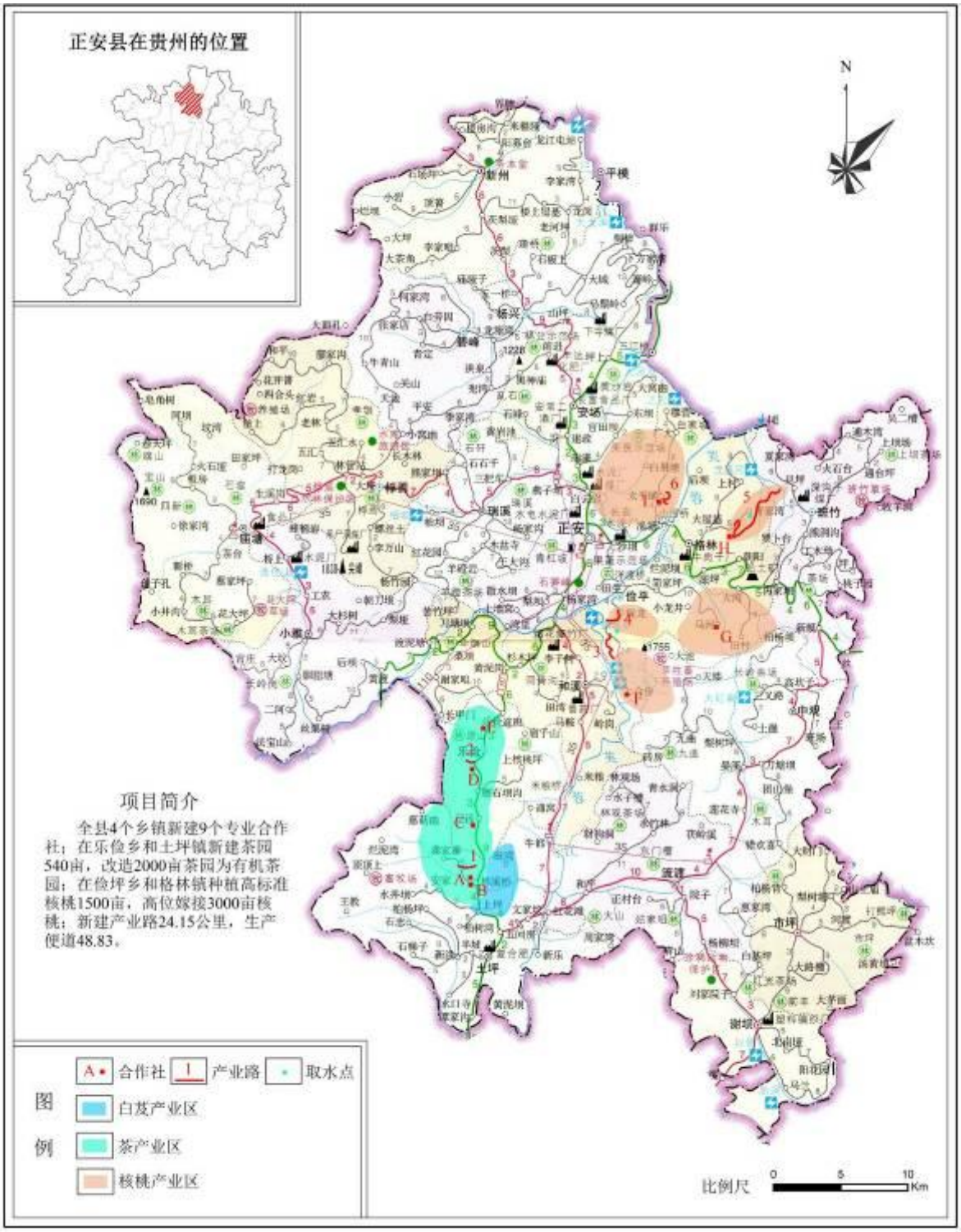


Figure 2.3-3 Project Area Distribution Diagram in Zheng'an County of the World Bank loan in Guizhou for Rural Development Project

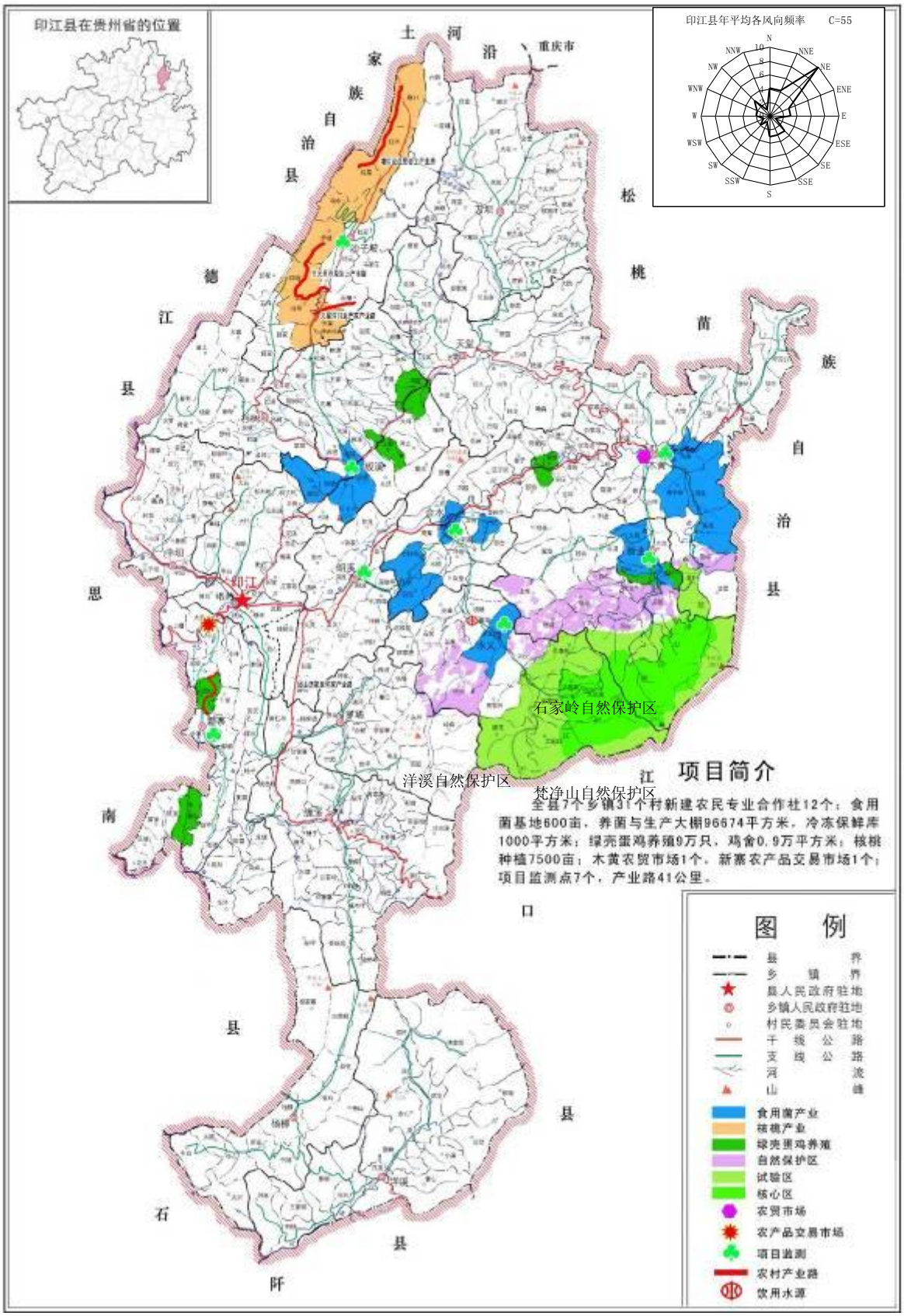


Figure 2.3-4 Project Area Distribution Diagram in Yinjiang County of the World Bank Loan in Guizhou for Rural Development Project

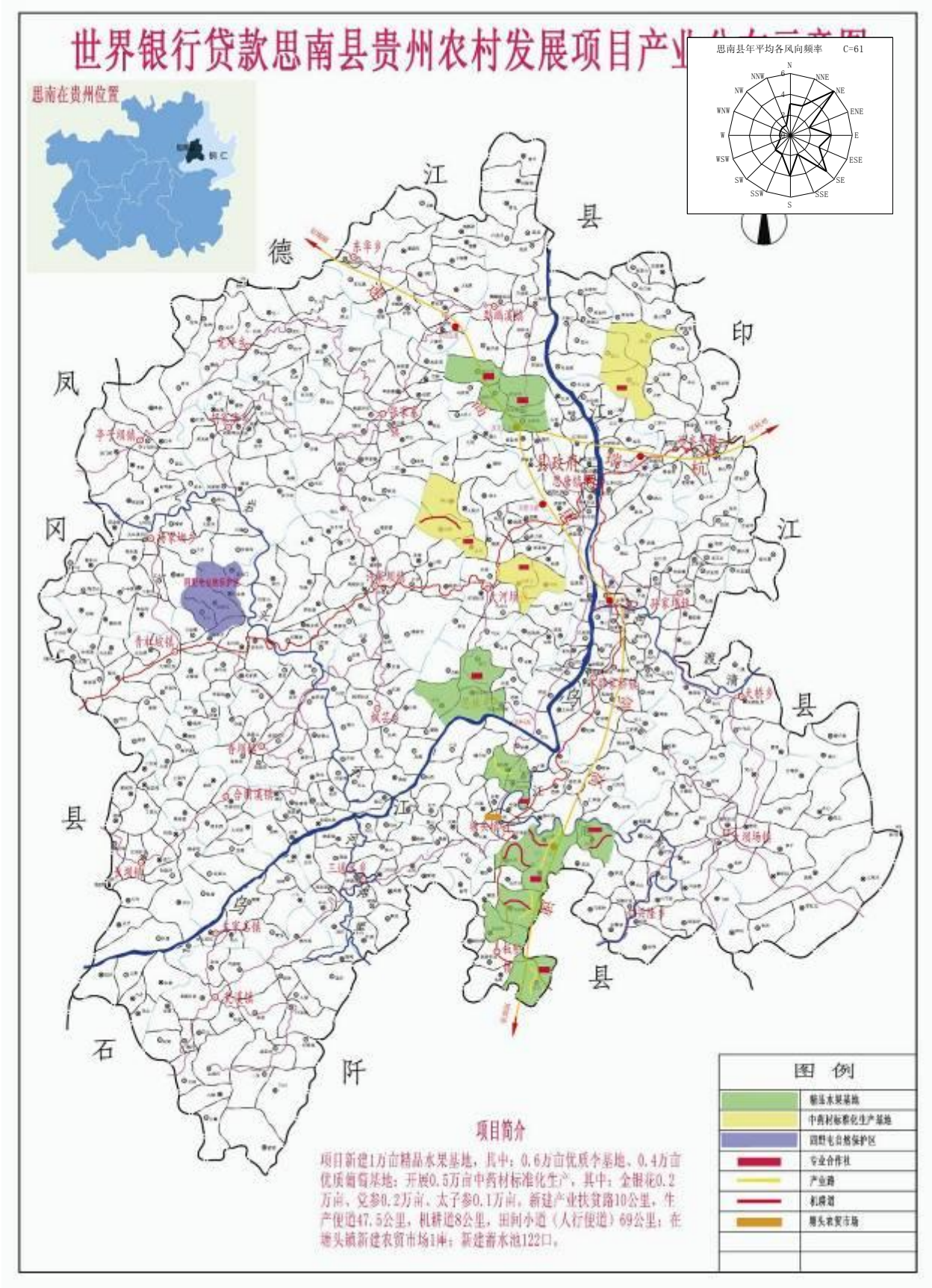


Figure 2.3-5 Project Area Distribution Diagram in Sinan County of the World Bank loan in Guizhou for Rural Development Project

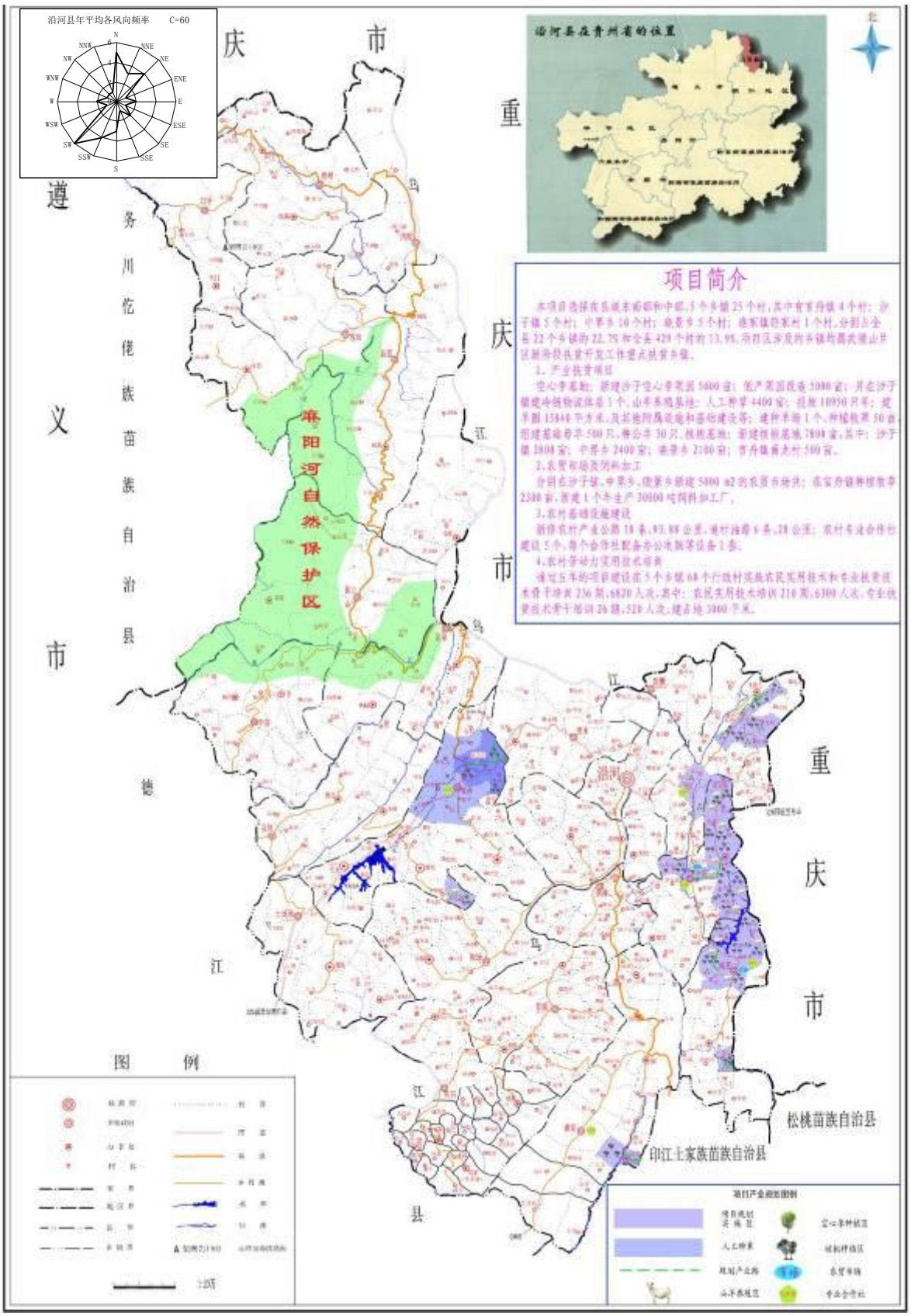


Figure 2.3-6 Project Area Distribution Diagram in Yanhe County of the World Bank loan in Guizhou for Rural Development Project

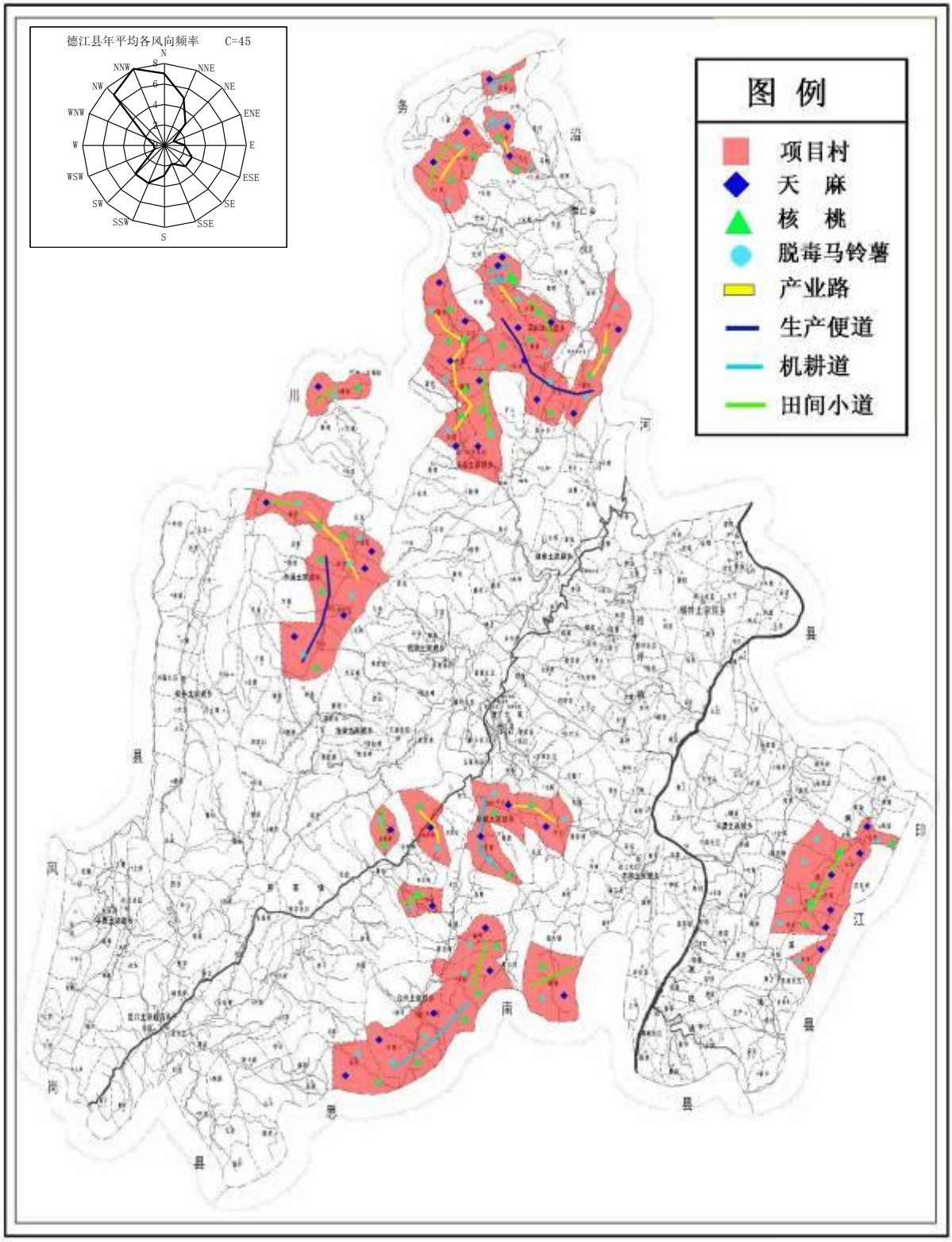


Figure 2.3-7 Project Area Distribution Diagram in Dejiang County of the World Bank loan in Guizhou for Rural Development Project

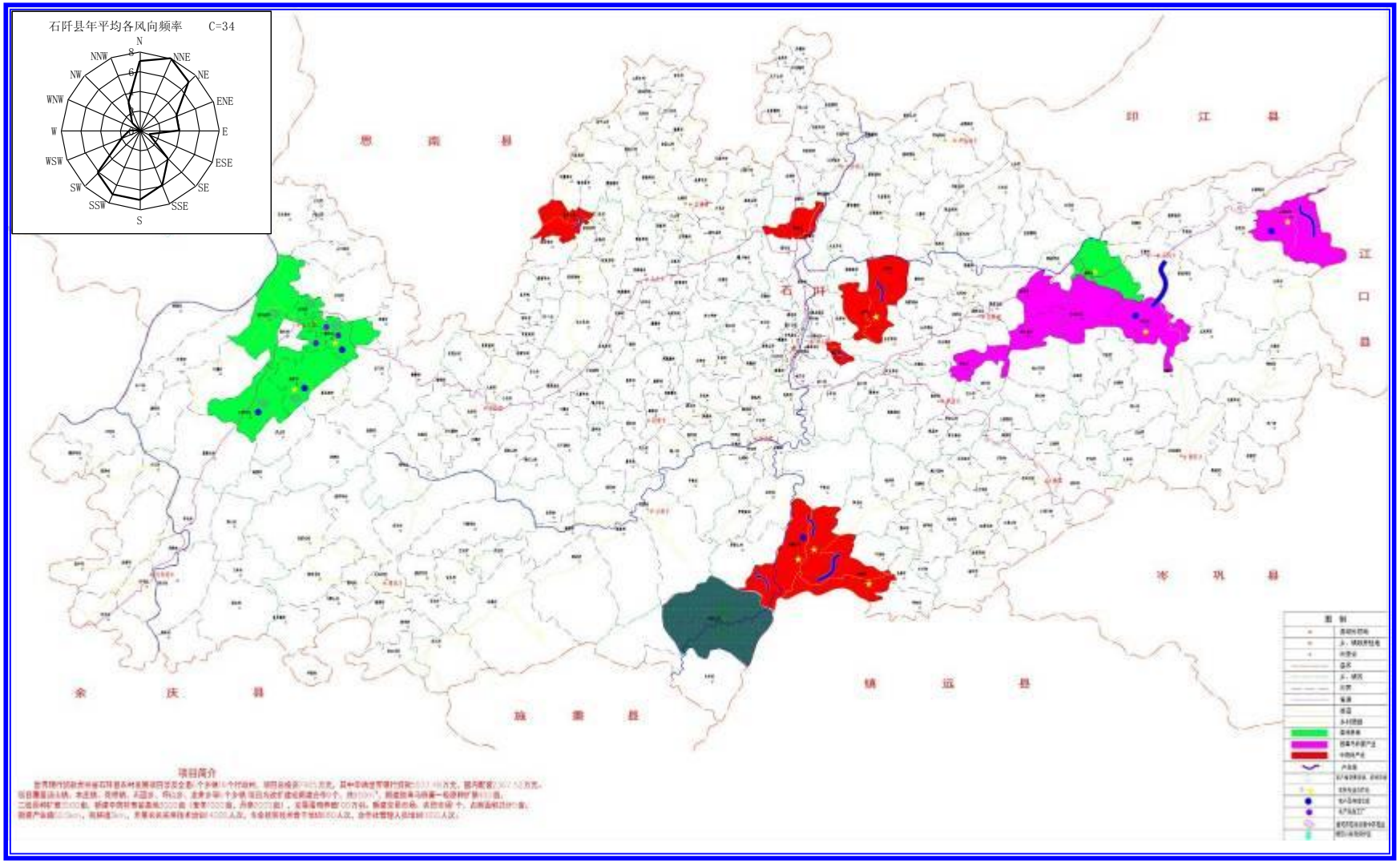
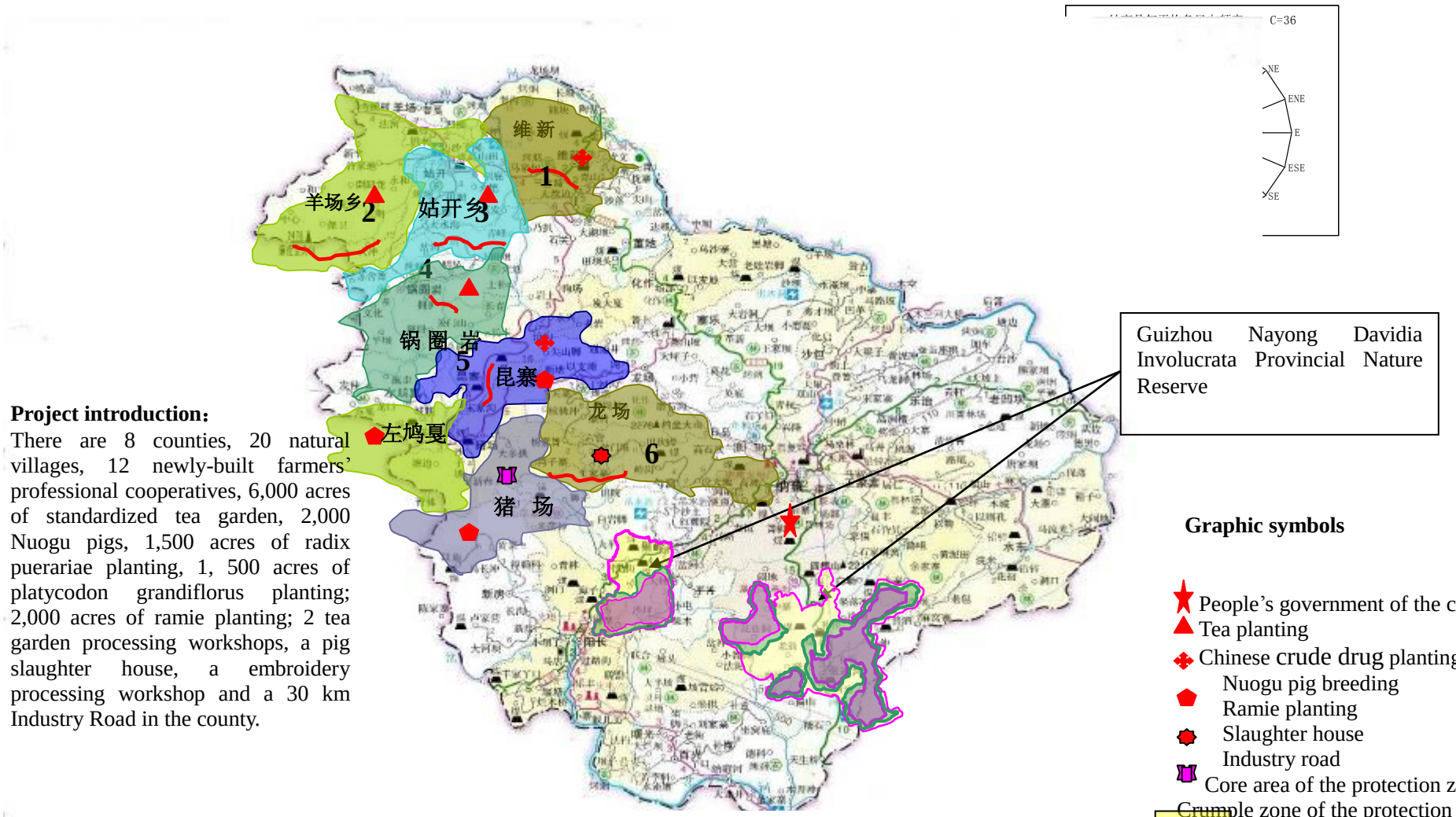


Figure 2.3-8 Project Area Distribution Diagram in Shiqian County of the World Bank loan in Guizhou for Rural Development Project t



Project introduction:

There are 8 counties, 20 natural villages, 12 newly-built farmers' professional cooperatives, 6,000 acres of standardized tea garden, 2,000 Nuogu pigs, 1,500 acres of radix puerariae planting, 1, 500 acres of platycodon grandiflorus planting; 2,000 acres of ramie planting; 2 tea garden processing workshops, a pig slaughter house, a embroidery processing workshop and a 30 km Industry Road in the county.

Figure 2.3-9 Project Area Distribution Diagram in Nayong County of the World Bank loan in Guizhou for Rural Development Project

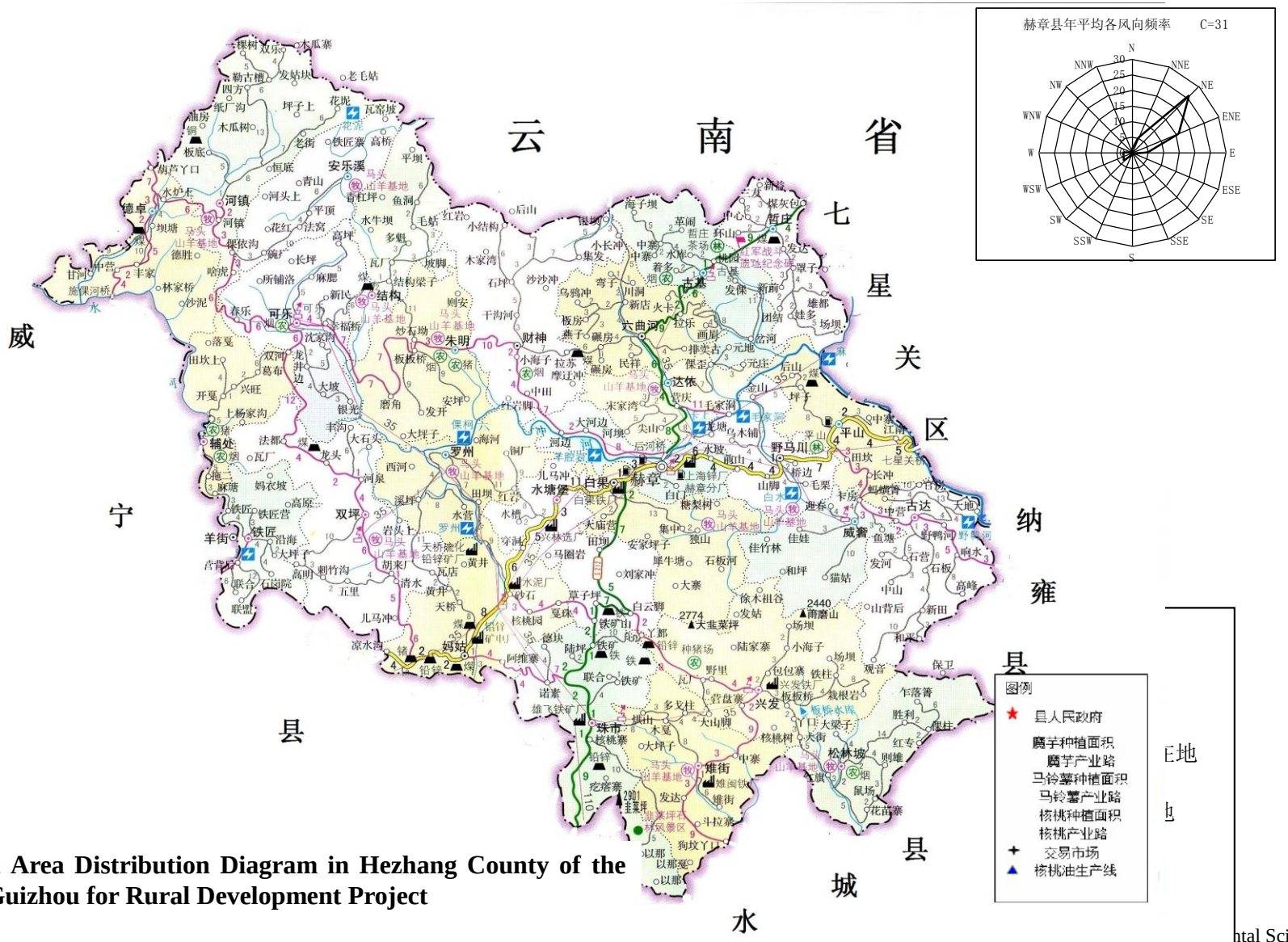
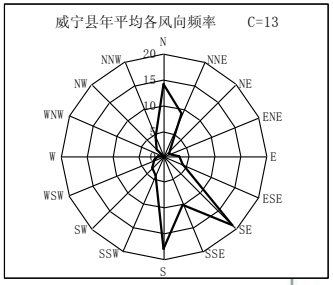


Figure 2.3-10 Project Area Distribution Diagram in Hezhang County of the World Bank loan in Guizhou for Rural Development Project



Project introduction:
There are 6 towns, 30 natural newly-built farmers' professional cooperatives, 10,000 acres of potato planting, 700 acres of konjac planting; 8 large-scale buildings; 240,000 hens, 1 commodities trading market in Caohai, 1 layer purchasing center

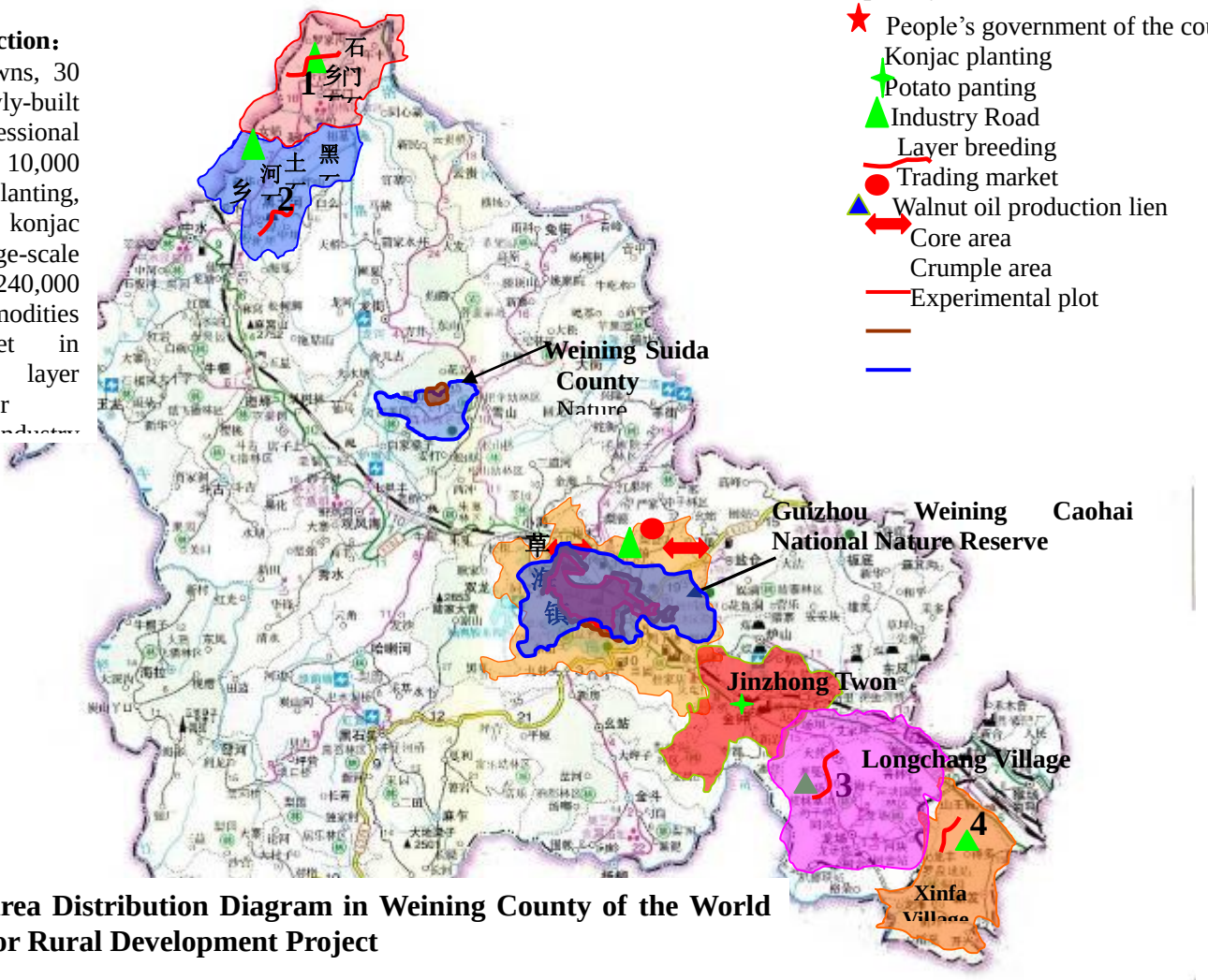


Figure 2.3-11 Project Area Distribution Diagram in Weining County of the World Bank loan in Guizhou for Rural Development Project

2.4 Various construction standards

1．Reconstruction and modernization of agricultural pillar industry

Tea：

Technical Regulations for Standardizing Safe Production and Planting of Tea（DB33/T 675—2008）

Tea Processing Enterprise Good Operation Standard

Standard Technical Regulations of Guizhou Tea

Chinese Crude Drugs：

Good Agricultural Practice for Chinese Crude Drugs (Trial) GAP (Chinese Food and Drug Administration Order No. 32) ;

Standardized Production Technical regulations of Radix Scrophulariae (Chinese Modern Medicine) 2008(10): 18-20);

Potato：

Code of Practice for Virus Free Seed Potatoes Production（GB/T29378-2012）;

Standardized Cultivation Techniques of Virus Free Seed Potatoes (Gansu Agricultural Science and Technology, the 11th Issue of 2012) ;

Management Measures of Guizhou Virus Free Seed Potatoes (Guizhou Agriculture Commission, 2012).

Walnut：

Technical Regulations of Guizhou Walnut Planting

Cultivation：

Animal Husbandry Law of the People's Republic of China (July 1st, 2006);

Animal Epidemic Prevention Law of the People's Republic of China (January 1st, 2008)

Pollution-free Food—Management Standard of Pig Feeding (NY/T5033)

Pollution-free Food—Management Standard of Layer Feeding (NY5043)

Construction Standards of Standardized Broiler Breeding Bases

Others：

Fertilizer Application Standards of Green Food (NY/ T 394-2000)

Pesticide Application Standards of Green Food (NY/ T 393-2000)

Implementation Handbook of Agricultural Product Processing and Storage Standards

Management Measures of Pollution-free Agricultural Products

2．Sub-project of infrastructure, supporting service and training & ability building

Unified Standard for Reliability Design of Building Structures (GB50068-2001)

Standard for Classification of Seismic Protection of Buildings (GB50223-2008）

Load Code for the Design of Building Structures (GB500009-2001)2006 Edition

Code for Seismic Design of Buildings (GB50011-2001) 2006 Edition

Code for Design of Building Foundation（GB50007-2002）

Technical Code for Ground Treatment of Buildings（JGJ79-2002）

Code for Design of Concrete Structures (GB50010-2002）

Code for Design of Steel Structures (GB50017-2003)

Technical Specification for Steel Structure of Lightweight Buildings with Gabled Frames (CECS102-2002)

Technical Code for Building Pile Foundation (JGJ94-2008)

Code for Design of Masonry Structures (GB5000.-2001)

Code for Transport Planning on Urban Road (GB50220-95)

Construction Specifications of Guizhou Rural Highway, Code for Design of Concrete Structures (GB50010-2002)

Code for Design of Concrete Structures (GB50010-2002)

Code for Transport Planning on Urban Road (GB50220-95)

Construction Standards of Farmers' Market (the Commerce Department)

Guizhou Rural Highway Engineering Technical Standards

Construction Standards of Guizhou Rural Highway

2.5 Related projects and their responsible investigations

2.5.1 Investigations on the upstream and downstream enterprises

For investigations on the upstream and downstream enterprises, please refer to Table 2.5-1.

2.5.2 Other projects with competitive resource

Investigate other projects, without plan or under construction, which will produce competitive resources for this implementation project.

Table 2.5-1 A list of upstream and downstream enterprises

Serial No.	This project	Related upstream and downstream enterprises							
		Name	Construction unit	Scale	Time to put into production	Technological process	Status of EIA approval	Current situation	Environmental protection conditions and suggestions
1	Walnut plating	Walnut deep processing project with an annual output of 10,000 tons in Yinjiang Autonomous County	Guizhou Green Energy and Technology Co., Ltd.	An annual processing of 10,000 tons of walnuts. An annual output of 250 tons of walnuts with high quality, 250 tons of walnut kernels with high quality, 2,000 tons of walnut oil wit high quality , 2,000 tons of walnut power, 30,000 tons of walnut milk beverage and 20,000,000 pellets of walnut oil capsule	December , 2014	Refer to the attached Figures 5.3.1-1 and 5.3.1-2 in Chapter Five of this report	Yinjiang Environmental Protection Bureau has approved. Y.H.B. [2013] No. 41	Under construction	Strictly implement the environmental protection measures approved by EIA
2		Construction project with an annual processing of 1,000 tons of walnut oil, 500 tons of walnut power and 1,000 tons of walnut leisure food in Zheng'an County	Zhen'an Tianhe Agricultural Development Co., Ltd.	An annual processing of 1,000 tons of walnut oil, 500 tons of walnut power and 1,000 tons of walnut leisure food	December , 2014		Zhen'an Environmental Protection Bureau has approved. Z.H.P.F. [2014]No.11	Under construction	Strictly implement the environmental protection measures approved by EIA
3		Newly-constructed process project with an annual output of 1,500,000 kilos of walnut oil and 2,000,000 walnut power in Hezhang County, Bijie City	Guizhou Hezhilin Food & Beverage Co., Ltd.	An annual processing of 150 tons of walnut oil and 2,000,000 tons of walnut power	December , 2014		Hasn't done EIA, still be in the study stage and preparing for EIA	To be constructed	Strictly implement the environmental protection measures approved by EIA

4	Gastrodiae planting	Dejiang Chinese Medicine Factory and Agricultural Product Processing Factory	Dejiang Jiutong Pharmaceuticals Co., Ltd.	An annual output of 3,000 tons of Chinese herbal pieces, 429 kinds of products, among which,127 are root or rootstalk category, 16 are skin category, 27 are vine category, 23 are leaf category, 27 are flower category, and 12 are fruit and seed category, 69 are whole herb category, 8 are resin category and 11 are bacteria and algae lichen category;4,000 tons of gastrodia health care products，including gastrodia milk (emulsion), gastrodia soup (solid agent), gastrodia gel (semi-solid agent, namely, jelly type), gastrodia oral solution (drink), gastrodia power and gastrodia pills.	March, 2012	Gastrodia materials →selecting and tidying →washing →cutting and drying→ checkout →stir-frying and cooking→ package →putting finished products into storage, storing and selling	Dejiang Environmental Protection Bureau has approved. D.H.P.B [2010] No. 61	Constructed	Strictly implement the environmental protection measures approved by EIA, qualified environmental protection
		Gastrodiae production and processing project	Guizhou Dejiang Kangqi Pharmaceutical Development Co. Ltd.	It produces 450,000m^2/a of gastrodiae improved variety; Gastrodiae processing: 250.000 kilos of fresh gastrodiae, 150,000 kilos of gastrodiae pills, 100,000 gastrodiae power. Bacteria production: 200,000 bottles of Mihuai bacteria and 200,000 bottles of germinate bacteria.	December, 2013	Refer to the attached Figure 5.1.1-4 in Chapter Five of this report for gastrodiae planting; Gastrodiae processing: Fresh gastrodiae →manual grading	Environmental Protect	Constructed	Strictly implement the environmental protection measures approved by EIA

						→selecting and tidying →washing →high temperature steaming→ baking in the kang →taking out of the kang →precise processing →package →putting finished products into storage, storing and selling			
5	Tea planting	Processing project with an annual output of 100 tons of tea with high quality	Xianlong Tancun Tea Specialized Cooperative in Wuchuan Autonomous County	An annual output of 50,000 tons of tea with high quality and 950,000 tons of large quantity tea	December, 2014	Refer to the attached Figure 5.3.4-1 in Chapter Five of this report	Hasn't done EIA, still be in the study stage and preparing for EIA	Under construction	Strictly implement the environmental protection measures approved by EIA
6	Goat breeding	Wuchuan Jiangyi ecological animal husbandry science and technology demonstration park processing factory construction project with an annual output of 80,000 tons of	Wuchaun Jiangyi Ecological Animal Husbandry Science & Technology Development Co., Ltd.	An annual output 80,000 tons of ruminant feed	December, 2014	Refer to the attached Figure 5.3.2-1 in Chapter Five of this report	Wuchuan Environmental Protection Bureau has approved. W.H.H[2013] No. 15	Under construction	Strictly implement the environmental protection measures approved by EIA

		ruminant feed							
		Processing construction project in Wuchuan County with an output of 50,000 tons of efficient biological organic fertilizer	Wuchaun Jiangyi Ecological Animal Husbandry Science & Technology Development Co., Ltd.	An annual output of 50,000 tons of efficient biological organic fertilizer. An annual handling of 125,000 tons of livestock waste, and an annual use of 25,000 tons of straw.	December, 2014	Refer to the attached Figure 5.3.2-2 in Chapter Five of this report	Wuchuan Environmental Protection Bureau has approved. W.H.H[2013] No. 14	Under construction	Strictly implement the environmental protection measures approved by EIA
7	Potato planting	Potato resource recycling project of Guizhou Jiusheng Starch Processing Co., Ltd.	Guizhou Jiusheng Starch Processing Co., Ltd.	With two starch production lines with an annual production of 30,000 tons; and a snowflake power production line with an annual production of 15,000 tons.	The starch production lines have been put into production in September, 2013,and the rest are to be put into production in December, 2014.	Potato storage →hydraulic handling →improving →multistep weeding →double-step stone-removing →double-step iron-removing →dehydration →three-level washing →improving →transmitting and metering →potato buffer storage →potato grinding →starch and fiber separation	Bijie Environmental Protection Bureau has approved. B.H.F. [2012] No. 26	Constructed	Strictly implement the environmental protection measures approved by EIA

						→starch milk concentration to extract cell liquid water →washing of starch milk →dehydration of starch milk →dry the wet starch → average volume cooling of dry starch→ selecting of dry starch →iron-removing→ automatic starch weighing and packaging →passing the metal detector →putting starch into storage, storing and selling			

3. BASELINE SITUATION OF THE PROJECT AREA

3.1 Project area

The area in which the Guizhou Rural Development Project upon the World Bank Loan is to be carried out covers the two concentrated contiguous indigent area, Mount Wuling Area and Mount Wumeng Area. The area involves three municipalities in which the involved eleven counties include 63 towns or townships of a total 243 project villages, and the three municipalities and eleven counties, namely, are Wuchuan County, Zheng'an County and Daozhen County of Zuiyi Municipality, Nayong County, Weining County and Hezhang County of Bijie Municipality, and Yinjiang County, Yanhe County, Shiqian County, Sinan County and Dejiang County of Tongren Municipality. See Attached Figure1 and Attached Figure 2 for the detailed distribution of the project area. The project enclothes a total population of 459050 (the population of all the project villages), in which the indigent people are numbered to 173448, and the number is 16.3% of the project towns'/townships' population and 18.5% of the total indigent population. See Table 3.1-1 for details of the Project Area. See Table 3.1-1 The Area for the Guizhou Rural Development Project upon the World Bank Loan

Table 3.1-1 The Area for the Guizhou Rural Development Project upon the World Bank Loan

project city	project county	project town	project village	population		Remarks(names of the towns)
				total	indigent	
Zunyi	Wuchuan	2	7	28559	5575	Fengle, Huangdu
	Daozhen	5	9	32198	11944	Luolong, Yuxi, Daqian, Yangxi, Longxing
	Zheng'an	14	12	49799	22382	Lejian, Tuping, Gelin, Jianping
	subtotal	11	28			
Tongren	Dejiang	7	42	64345	19610	Shaxi,Fengxiangxi, Gaoshan, Quankou, Changfeng, Yantang, Hexing
	Yanhe	5	25	34782	12941	Zhongjie, Xiaojing,Guanzhou, Shazi, Qiaojiazhen
	Sinan	6	28	33783	11321	Tangtou,Banqiao,Silin,Yingwuxi, Daheba, Liangshuijin
	Yinjiang	7	33	45317	16754	Shaziba, Banxi, Xinzai,Heshui, Muhuang,Xinye, Yongyi
	Shiqian	6	19	29311	24077	Pingshan, Shigu, Huaqiao,Longjin,Tangshan, Benzhuang
	Subtotal	31	147			
Bijie	Nayong	8	20	30878	19868	Gukai, Yangchang, Guoquanyan, Weixin, Kunzai, Zuchang, Zuojiuga
	Hezhang	7	18	52900	10366	Caishen, Kele, Fuchu, Shuitangpu, Zhuming, Songlinpo, Yemachuan
	Weining	6	30	57088	19610	Shimen, Longchang, Heituhe, Xinfa, Caohai, Jinzhong
	Subtotal	21	68			
Total	11	63	243	459050	173448	

3.2 Natural environment of the project Area.

3.2.1 Wuchuan County

1. Geographic location: Wuchuan Kelao and Miao Autonomous County lies in the northeast of Guizhou Province. It links Guizhou Province and Chongqing Municipality and it runs from East longitude 107° 30' to 108° 13′ and North

latitude 28° 11' to 29° 05′ , 125 kilometers from north to south and 62 kilometers from east to west. It is an accessible place with adjacencies of: Wulong County and Pengshui Miao Autonomous County of Chongqing Municipality on the north, Fenggang County on the south, Dejiang County and Yanhe Tujia Autonomous County on the east, and Zheng'an County and Daozhen Kelao and Miao Autonomous County on the west. The project is planned to be carried out in Fengle Town and Huangdu Town, south of Wuchuan County.

2. The landform and relief: Wuchuan County is a typical agricultural county with a tilt along its northwest-southeast, and mainly has middle mountains, hills and downs and an average elevation of 1034 meters from 650 meters to 1000 meters with a 1417.7 meters of differences in height (DH), for Sunzigai in Zhuoshui has the Highest Altitude of 1743 meters and Hongdu River in Hong si Township has the lowest altitude of 325.3 meters.

3. Climate and weather: Wuchuan County has a average perennial temperature of 15.7℃ with its average high temperature 20.1℃and its average lowest temperature 12.8℃(The extreme minimum temperature is -5.6℃ and the extreme maximum temperature is 39.5℃). Perennial average quantity of precipitation is 1198.3 mm with 1561.5mm of the maximum precipitation quantity and the 896.9 mm of minimum precipitation quantity. Annually, the prevailing wind direction is NNE. In summer, the dominant wind is NNE and SE wind while the winter dominant is NNE wind. The annual calm wind frequency is 31%. And the average wind speed for many years is 2.1 m/s and the maximum wind speed reaches 23.0 m/s.

The average relative humidity of the county is 80% and the minimum relative humidity is 14%. The annual average amount of evaporation is 1022.9 mm with 1234.4mm of the maximum evaporation quantity and the 887.1 mm of minimum amount of evaporation. The annual mean air pressure is 938.7 hpa with its tiptop air pressure of 961.6 hpa and its minimum air pressure of 988.9 hpa.

4. The hydrology: Furongjiang River is the main branch of Wujiang River to its left bank. It runs for about 230 km from Donglu Jianba Township, Daloushan, Suiyang County, Guizhou Province, with its natural drop height of about 1100m and its mean sloping of 4.8‰and the river basin area covers more than 7360 km2. The river runs through northeast Zunyi and Pengshui County and Wulong County of Chongqing Municipality. The Furongjiang River lies 9 km to the northwest of mining area.

The Zhuoshui, the biggest branch of the Furongjiang River, runs for about 10 km to the north along mining area, from east to west and into the Furongjiang River. The part of the river in Zhuoshui Town has an elevation of about 800m and has a sudden fall. The stream valley looks like a V and the mean hydraulic gradient reaches 2.4%. The general flow of the river through Zhuoshui Town is over 100m3/h. The Meigudong creek, the Zhaizi creek and the Xiaojiawan creek are the Zhuoshui River's branches to the south.

The Hongduhe River is the first branch of Wujiang River. It runs from Xihe Town, Meitan County, through the counties of Zheng'an, Fenggang, Wuchuan, Dejiang and Yanhe, etc. and into Wujiang in Hongdu Town, Yanhe County. The main river is 205 km long and its catchment area is 3739 km2.

5. The diversity of vegetation and life style: The earth in Wuchuan County can be classified into 5 soil types, 13 subgroups, 53 soil genuses and 33soil species. The relief of mining area is middle- mountain landform, and the middle and upside part of the highland has thin bed or medium thin bed of earth. The low-lying forms quench slime farmland while the cold flat tidal lands are ditributed in the shaden Clamp

grooves. The farmland in this area is almost douban yellow mud field formed of yellow loam. The soils are mainly the grey sand yellow soil, douban yellow sand soil and lime soil, all of which are belong to yellow loam. Most of the natural soils are salic yellow soil, ferrallitized soil and dolomitite black calcareous soil.

The regional protogene vegetation through out the county is evergreen broad-leaf forest. The vegetation in parts with 1000m~ 1200m altitude is evergreen leafy, mainly cupule family, and other families such as evergreen chinquapin family, camphor of camphor family, wet nan family. They are all distributed in the shaden gentle slopes. while in parts with altitude of less than 1000m are mainly subfault vegetation.

The kinds of ebon are Chinese red pine, China fir, sunflower pine and cypress and so on. The bushes distributed here are mainly pyracantha, Zanthoxylum planispinum Sied, China rose and rosebush, etc. The main kinds of trees protected here are : Chinese yew, gingko and nan trees.

To calculate in accordance with the new criteria, the forest area(including woodland and special provided national shrubland), with the forest coverage of 48.03%, is 133190.20km2, occupying 81.06% of the total woodland area of the county; while to calculate in accordance with the criteria of the forest law, the forest area(including woodland and special provided national shrubland), with the forest coverage of 52.11% , is 144478.60km2, occupying 87.93% of the total woodland area of the county.

According to the survey, there live 44 kinds of mammalia animals, 22 kinds of reptilia, 50 kinds of birds, 12 kinds of amphibians and 56 kinds of fishes.

Among them, pangolins, giant salamanders, night owls, otters, grey cranes and golden pheasants are under the national secondary protection.

The insects in this area belong to 5 catalogues, 36 families and over 70species in total.

3.2.2 Daozhen County

1. The geographic location: Daozhen County lies in the very north part of Guizhou Province with its northwest and northeast adjacent to Nanchuan City, Wulong County and Pengshui Miao Autonomous County of Chongqing Municipaliy, and its southwest and southeast adjacent to Zheng'an County, Wuchuan Kelao and Miao Autonomous County of this Province. The project is planned to be carried out in Luolong Town, Yuxi Town, Daqian Town, Yangxi Town and Longxing Town in Daozhen County.

2. The landform and relief: The topographic form configures the higher east-west part and the low central part. To see it thoroughly, it runs from the north upto the south with the outline of a dustpan and belongs to the karst relief family. The highest altitude of the county is 1837.8m and the lowest altitude 448m.

3. The climate and weather: The Climate prevalent in Daozhen County is northern subtropical monsoon wet climate with a kind of mild weather neither too cold in winter nor too hot in summer. The place enjoys abundant rain all round the year rainy and warm in the same season. According to the weather information accumulated in Daozhen Weather Station for many years, the dominant climate can be described as following: the annual mean air temperature is 15.6℃, the mean air temperature in the extremely cold month(Januaray) is 4.9℃, and that in the extremely hot month(July) is 25.9℃. The extremely high air temperature can reach 39.1℃ and the extremely low air temperature may fall down to 1.7℃. The mean quantity of precipitation is 1070.7mm and the mean quantity of evaporation is 669.7mm, and the maximum quantity of precipitation a day is 133.3mm. The relative humidity is 81% and the sunlight time of the whole year counts for 1076.1hours.

4. The hydrological characteristics: The rivers running through Daozhen County

are the kind of that originated-from-rain rivers mainly namely: the Furongjiang River, the Huaixi River and the Daijiagou River, etc. The Furongjiang River is the main branch of Wujiang River to its left bank. It runs from Donglu Jianba Township, Suiyang County northeastward through Zheng'an County Daozhen County of Guizhou Province, Wulong County, Pengshui County of Chongqing, and finally into the Wujiang River in Jiangkou Town, Chongqing Municipality. The river basin area covers more than 7376 km2 with the whole length of about 231 km and the riverbed drop rate of 4.8%. The Furong River runs into Daozhen County in the southwest, Longxing Town and goes on northeastward slanting through the county. It runs through the towns, Zongping, Jiucheng and Taoyuan and finally out of the county at Shajiao into Jiangkou Town, Wulong County and at the same place it flows into the Wujiang River. The part of the Furongjiang River through Daozhen County runs for 62.7km, with the drop height of 132m and riverbed drop rate of 2.1%. The main tributaries to Furong River are the Maijiang River, the Sanjiang River and the Luolong River. There exist other 7 tributaries, namely, the Guitangxi River (7.8km long with a total riverbasin area of 2424km2. The Cizhugou River is 7.8 km long and has a total river basin area of 49km2The Huaixi River is 15km long and has a total river basin area of 71km2The Baitan River is 7.7 km long and has a total river basin area of 31km2The Panxi River is 7 km long and has a total river basin area of 43km2The Dingjia River is 25.5 km long and has a total river basin area of 144km2The Shui River is km long and has a total river basin area of 199 km2

5. The land resource: The county occupies a total area of 2156 m2 and the population density is 141 people per km2. And the per capita land area is 11 mu that is more than the per capita level of the whole province. The county has a total farmland area of 750,000 mu, a total woodland area of 1,200,000mu and a total grass hilly area of 1,060,000mu, of which some land suitable for foresting covers 600,000mu and there are 24 patches each of which covers over 10,000mu and that totally sum to a whole 470,000mu.

6. The diversity of vegetation and life style: In Daozhen County live more than 3000 kinds of advanced plants. Among them are 885 kinds of forest woody plants, 16 kinds of valuable and rare plants under the national first or secondary protection, such as world widely known cathaya argyrophylla which are called the treasure of forest, davidia involucrate called Chinese dove tree, Chinese yew which are called the anticancer starlet, three-point fir, the relict plant gingko only survived in China, Emmenopterys henryi Oliv, liriodendron, Tetracentron sinense and yellow fir, etc. In the county are also more than 60 kinds of fast-growing plants or plants for special use, over 10 kinds of grease and ethereal oil plants. Among the plants for special use are mainly pines, firs and cypress. The the amount of trees growing here is over twice as much as that in the northeast part of China by the virtue of the excellent natural condition in the county. Economic woods appear a large range of variety. Of them, tung oil tree, Excoecaria sebifera, raw lacquer, Rhus semialata, nut, Chinese chestnut, tu-chung, palm, persimmon, jujube and litsea cubeba abound in the whole county. The county, one of the tung oil production bases, has a long history running the business of tung oil tree industry and was once ranked the third of the whole country. It is have been found out that there are 550 kinds of plants for medical use, therefore the county is praised as the Drug Storage of North Guizhou. Among the Chinese herb medicine, some grown the county, namely gastrodia elata, Coptis chinensis, tu-chung, Luotung, gallnut, Panax japonicus, have all been praised greatly at every previous Canton Fair and therefore found its way into every corner of the country. The amount of Coptis chinensis production has been ranked the first of the province and gastrodia elata,

Coptis chinensis and luotung are the famous Daozhen medicine.
The vast meadow and the great variety of pastures make the favor of the development of the herbivorous livestocks.

3.2.3 Zheng'an County

1. The geographic location: Zheng'an County, lying in the northern part of Zunyi Municipality, is the important Economic and cultural syncretic zone of north Guizhou and south Chongqing.

It is an accessible place with adjacency of: Wulong County and Pengshui Miao and Tukia Autonomous County of Chongqing Municipality on the north, Fenggang on the south, Wuchuan County and Daozhen County on the east. The project is planned to be carried out in Lejian township, Jianping township, Tuping Town and Gelin Town of Zheng'an County.

2. The landform and relief: The topographic form configures the higher east-west part and the low central part. To see it thoroughly, it runs from the north upto the south with the outline of a dustpan and belongs to the karst relief family. The highest altitude of the county is 1837.8m and the lowest altitude 448m.

3. The climate and weather: The dominant climate of Zheng'an County is the subtropical wet monsoon climate. Zheng'an County has a mild climate and enjoys four distinctive seasons, plenty rain and a longer frostless period. Heat and rain, especially in the phase of the crops growing vigorously and the hot and rainy season, facilitate the growth of the crops. As a result of the large relief altitude difference, the three-dimensional agricultural climate is obvious with the presence of all the cool, mild and warm weather. However, the county has less sunlight and therefore it has more rain and summer drought.

4. The hydrology situation: The rivers in Zheng'an County are rain-originated rivers and they are numbered to 393. Among them the important ones are the Furong River, the Xiebahe River and the Hongxihe River. The total length is 1757km and the density of the river distribution reaches 0.7km/ km2. These rivers have strong erosion and deep cuts, forming the phenomenon of rivers underneath the farmland; the flow of the surface water is 1,610,000,000m3 per year. This area abounds with Plenty of ground water with the mean flow of 290,000,000m3 and the production is 624,000m3.

5. The land resource: The whole county's land spreads for 3,892,500mu, of which the farmland is 1,100,000mu and makes 28.26％ of the total; woodland 1480,000mu, 38.02％ of the total; grassland 321,000mu, 8.26％ of the total, the other 991,000mu, 25.46% . As for Mineral resources, the county has 16 kinds of mineral products, such as coal, bauxite, limestone, Potassium shale, griotte, etc. Coal, bauxite and griotte have the bigger exploring potential.

6. The diversity of vegetation and life style: In Zheng'an grow more than 2500 kinds of plants, among them there are more than 1500 kinds of herb medicine, among them the unique ones are pawpaw, Bletilla, tuchung and gastrodia elata. The more than 70 kinds of wild animals live in Zheng'an County and the valuable ane rare mainly giant salamander, etc. The domestic animals include swines, cattle, sheep, horses, rabbits, chickens, ducks, geese and bees. The aquatic products are mainly fishes.

3.2. 4 Dejiang County

1. The geographic location: The project is planned to be carried out in Dejiang County, the northeast part of Guizhou Province, adjacent to the west of Tongren Municipality. The county spreads from north latitude 28° 00′ to 28° 38′ and from east longitude 107° 36′ to east longitude 108° 28′ . It runs eastward to Yinjiang County, southward till Sinan County, and links Fenggan County in the west and

inserts northward between Yanhe County and Wuchuan County. It extends 78.88 km from the north to the south and 63.68km from east to west. The area has a circumference of 370.33km and the total area 2071.92km2. The County seat is 179 km away from Zunyi City, 342km from Guiyang City and 262 km from Tongren Municipality. According to the national and Guizhou provincial development plan, there will be three speedways, five railways and one port joining in Dejiang. Among them, the speed way had been built and open to traffic by the end of the year 2013, the speed way from Youyang to Rongjiang is being built, the one from Dejiang to Xishui will begin before long, and the five railways, i,e, respectively, the one from Zhaotong to Qianjiang, the one from Duyun to Qianjiang, the one from Qianjiang to Hekou, the one from Chongqing to Guangzhou and the one from Zunyi to Jishou, are orderly carrying forward, and the Wujiang River Shipping Dejiang Port is expected to be finished within this year. As the construction of the speed ways and the railways mentioned above gradually goes on, Dejiang County will become the hub communication city connecting all the circumjacent areas by land and water.

2. The landform, relief and geography: Dejiang County lies on the south of the northeastern plateau in Guizhou Province. It links the Dalowshan mountain range and the Wuling mountain range with the landform heaving voilently, mainly, the west higher and the east low, the highest altitude is 992m and the lowest altitude is 300m. In the project area roll chain of mountains and lie many deep valleys cutting one another. So the landform is steep and the natural slope is large. The landform is the typical hilly terrain and the medium and low hilly stream valley denudation and erosion relief. Dejiang County is located in northern drape zone on Guizhou, the exposed terranes, either old or new , belong to Cambrian system, Ordovician, silurian system, Permian System, Triassic and partly quaternary system. The total thickness of the terrane is over 3500m, of which the soluble exposed rocks occupy 70%.

3. The climate and weather: The prevalent clibate in this area is subtropical monsoon wet climate of which the characteristics are monsoon climate distinctive, plenty of heat, mild weather, plenty of rain and sunlight in the same season, and a long frostless period. According to the information accumulated in Dejiang Weather Station for many years, the annual mean temperature is 16.0℃, the mean temperature in Januaray is 4.9℃, the mean temperature in July is 41.2℃, the extremely lowest temperature is - 8℃, the frostless period is 295 days, the annual mean quantity of precipitation is 1239.8mm, the annual mean sunlight time is accumulated for 1069.8 hours, the relative humidity is 81% and the dominant wind direction is northward.

4. The hydrology and the water system: The rivers in Dejiang County is of the Wujiang River catchment family belonging to the Changjiang River river system. In this area there are 178 rivers. Among them, 31 rivers, either trunks or branches, have the riverbasin area of more than 20km2 and the length of over 10 km. The total length of the rivers in this area is 574.9km. The total area of the part of the Wujiang River basin in Dejiang County is 2071.9 km2, the first ranked tributaries are the Liuchihe River, the Matihe River and the Yinjianghe River, etc. The main river of the Wujiang River runs into this county from the eastern border of Sinan County, through Chaodi, Changbao, Gonghe, Wenping, Jingjiao till Tongjingwangpai and at there into Yanhe County. The length in Dejiang County is 46km.

5. The soil and vegetation: The soil parent materials form the specific soil of this area (in Dejiang County) are mainly carbonatite, Clastic rock weathered granite, red clay of Modern the quaternary system, Modern river alluvial deposits, etc. The earth in the County can be classified into 5 types, 15 subgroups, 27 soil genuses and 58soil species. Alongside the speedways to be built there are mainly Yellow soil, lime soil

and paddy soil. The other types of soil distribute sporadically.

The vegetation: As a result of anthropogenic factor influence, the native vegetation in the evaluated area has been destroyed. The exsiting plants are mainly subfault vegetation, such as Chinese red pine wood, cedarwood, China fir wood, brushwood, etc, besides, there are some farm vegetation such as paddy, mealie, rape and vegetables. The forest land area in Dejiang County stretches 67622hm2. Of the total area, there is 40417hm2 for forest land, 3257hm2 for open forest land, 11926hm2 for no-forest woodland and 4hm2 for no woodland and the forest coverage rate is 25.38%.

Dejiang County, in which the project is planned to be carried out, lies in the subtropical broad-leaf forest zone and abound with forest, medicinal materials, and pasturage. According to the statistics, 4689 kinds of vascular bundle plants grow here. Among them, aquatic vascular bundle plants numbering 48 kinds, fern 120 kinds, gymnosperm 21 kinds, angiosperm more than 4500 kinds (dicotyledon, more than 3000 kinds and monocotyledon more than 1500 kinds.). Different plants combinate in different form, so the composition of the vegetation is complex. The trees in this area belong to 71 families, 218 tree species. The mains are pine family: Chinese red pine, Chinese whitle pine; fir family: China fir, cryptomeria and cypress family: cedarwood, sabina chinensis, Chinese juniper and arborvitae, etc. On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild animals that are in imminent danger and well-known old trees.

6. Animals: Because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information, surveys the related certification from the local, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3.2. 5 Yanhe County

1.The geographic location: Yanhe County stretches from east longitude 108° 03′ 49″ to east longitude 108° 37′ 53″ and from north latitude 28° 12′ 45″ to north latitude 29° 05′ 23″. It lies in the northeast of Guizhou Province, in the northwest of Tongren Municipality. It is on the lower course of the Wujiang River. This county is 180km from Tongren Phoenix airport, and 60km from Yuhuai Railway Youyang Station. The northern and the eastern parts border on Pengshui Miao and Tujia Autonomous County and Youyang Tujia Autonomous County of Chongqing and the eastern part connects to Songtao Miao Autonomous County and Yinjiang Tujia Autonomous County. The southwestern part and Dejiang County have a common border and its northwest borders on Wuchuan Kelao and Miao Autonomous County.

2. The landform, relief and geography: Yanhe County lies on the slope in the northern edge of the Guizhou plateau and in the intersection of the Dalowshan Mountain Range and the Wuling Mountain Range. The Wujiang River runs from south to north cutting the whole county into two halves: the northwestern part belonging to Dalowshan Mountain Range and the southeastern part belonging to Wuling Mountain Range. There are 8815 mountains and hills rolling in this area with the rate of 3.6 hills per square meter. The highest altitude of this area is 1462m and the lowest altitude is 225m. Of the whole area, the highland is 69.9%, the upland occupies

27% and the plain is 3.1%. It is a typical karst mountainous area with the karst area occupying 72.5%, and the non-karst area occupying 27.5%.

3. The climate and weather: The dominant climate of Yanhe County is the subtropical monsoon wet climate. The mean temperature in this area is 13～18℃ and the annual quantity of precipitation is 1050～1220 mm and the annual sunlight period is 1100～1400 hours. The climate here is warm and wet, and this area enjoys water, heat，sunlight and suitable temperature simultaneously. Thus, this kind of climate condition is suitable for many kinds of animals, plants, microorganisms, etc. to grow.

4.The Hydrology and the River System: The rivers in Yanhe County, including 26 rivers, namely, the Wujiang River and its tributaries, the Hongduhe River, the Anxihe River, the Bainihe River and the Batuohe River, etc., belong to the Wujiang Hydrographic net, the Changjiang River Basin. The total length of all the rivers is 548.7km and the density of the river net is 22.2km /100km2 which is 5.1 km longer than the mean length /100km2 of the province. The main river of the Wujiang River is 132km long and the theoretical hydroenergy reserve is 994,000kW. The theoretical hydroenergy reserve of the 25 middle or small rivers, which are more than 10 km long and have a catchment area of 20 m2, is 97,800 kw. To estimate by using many years' mean minimum flow rate, the ground water dynamic reserve of the whole county is 343,000,000m3, in the median water year,332,700,000m3, in the dry year, 271,000,000m3 and in the special dry year,202,400,000m3. The regional ditribution of the ground water is in accordance with that of the quantity of precipitation, i.e., the northern groundwater is more than the south groundwater. The water production per km2 is 20,000 m3 more than the water production of the Changjiang River Basin which is 120,000m3. The groundwater abouns in this area and the temperature of the water is 8～ 20℃, and the temperature of hot spring can reach 55℃.

5. The soil and the vegetation

Soil: The soil in this area is mainly form of yellow soil and yellow lime soil, and other minor soils, such as yellow brown soil, purple soil and paddy soil, etc.

The vegetation: the zonal vegetation are evergreen broad-leaf forest distributing in the highland with the altitude of less than 1300m. The representative tree species are cupule family evergreen types and camphor family plants, such as little red mangrove, Castanopsis fargesii, Daphniphyllum oldhami and Engelhardtia, etc. Because of the constant activities of the human, few kinds of the native vegetation in the project area has survived, the proportions of the vegetation are mainly subfault vegetation, farmland vegetation and cultured vegetation. These kinds of vegetation include Chinese red pine,cedarwood,China fir, cultured sweetgum, Chinese aspen, shrub, herbage, etc and plum, tea leaf, paddy, mealie, potato, rape ,vegetable and so on. On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild plants that are in imminent danger.

6. Animals: Because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information and the related surveys, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3.2. 6 Yinjiang County

1. The geographic location: The project is to be carried out in Yinjiang County, Tongren Municipality, the northeastern part of Guizhou Province. The county spreads from east longitude 108° 17′ to east longitude 108° 48′, north latitude 27° 35′—28° 28′. It runs 83.6km from north to south and 49.4km from east to west. The total area is 1969km2. This county lies at the foot of the peak of the Wuling mountain range(the peak named Mount Fanjing is famous as a famous Buddhist mountain) with adjacencies of: Jiankou County, Songtao County on the east, Shiqian County on the south, Sinan County and Dejiang County on the west and Yanhe County and Xiushan County, Chongqing Municipality on the north. This county is 170km to the west of Tongren Airport, and 410km to the east of the provincial capital, Guiyang, 110km to the south of Xiushan Railway Station and 80km from Yuhuai Railway Songtao-Mengxi Station (which passes through territory to another county.). The Provincial-level roads S303 and S304 intersect in this area and there are enough roads leading to every corner of the county which makes the traffic is very easy and all the path connecting villages are absolutely asphalt roads. The Tongren airport is now open to navigation, and Yuhuai Railway, Hangrui Railway have been completed and are open to traffic. The roads in the county, namely, Tongsi, Yinsong, Yinyan, Yinde, Yinshi Yinxiu, are all open to traffic, too.(60km away from Qingxi-Mengxi Station). (See Figure 1)

2. The landform, relief and geography: Yinjiang County, lying between the eastern hilly land and the northeastern canyon, on the transitional slope from the Yungui plateau to the west of Hunan and the Szechwan bason, is to the west of Mount Fanjing, the peak of the Wuling Mountain Range, forming the relief with higher east and lower west, and with a tilt from southeast to northwest. The shrug bumps of Mount Fanjing, with the altitude of 2493.8m, is the peak of the county, and the lowest lowest point ,the joint of Sinan and Dejiang, is in the west with the altitude of 377.7m. The relative altitude difference is 2116.1m and the straight distance between the highest place and the lowes one is 46.12km. The landform of this area can be classified into medium high mountains, medium mountains, medium downs, and low mountain relief, and the geomorphic type include corrosion, erosion and stream valley erode piled up relief, and the karst landform, distributing widely, is the main relief in Guizhou Province. The relief of nearly all parts of the province belongs to this type excep Mount Fanjing in the southeast. The eastern Mount Fanjing area, with the mean altitude more than 1600m,The terrain of intensive cutting, the relative altitude difference great, the steep slope, is the medium high mountain and mainly the erosion relief; the middle Mount Fanjing area, with the 1000- 1600m altitude of the front edge, the steep or slow gradient, is the low medium mountain and mainly karst landform river eroded piled up relief and erosion landform; the central part, the southwestern part and the southern part, with the altitudes of 800- 1000m, is medium down and mainly karst landform, erosion landform and river eroded piled up relief and erosion landform; the rest of the county, with altitudes 700- 800m, relative altitude difference of 200- 300m, lesser gradient, are low mountain relief. In the topographical highland stream valley region, the perennial river water erosion forms some relatively flat stream valley eroded piledup relief, but its area is not vast.

3.The climate and weather: Yinjiang County has mainly subtropical warm wet monsoon climate with the annual mean temperature of 16.8℃, the sunlight time of 1255h, nearly-30-day frostless period, annual rainfall of 1100mm and it's not too cold in winter nor too hot in summer. The perennial dominant wind direction and frequency: C, NE(55,10), the mean wind speed over the years: 0.9m/s; the mean evaporation quantity:1174.7MM; the annual most frequent wind direction and

frequency: C, Ne(55,10); the annual sunlight time: 1296.9 hours; In winter, the wind speed outside:1.0m/s, in summer, the wind speed outside:1.0m/s, the year's maximum wind speed(in specific period):12m/s, the extreme highest air temperature: 39.9, the extreme lowest air temperature: -9.0℃， the mean air temperature over the years:16.8℃， the average relative humidity over the years:78% ,the maximum average relative humidity:100%, the minimum average relative humidity:9% , the mean air pressure over the years:96,220p, the mean quantity of precipitation over the years:1113.4mm, the maximum quantity of precipitation over the years:1621.6mm, the minimum quantity of precipitation over the years:678.7mm, the days with the daily mean temperature:<=5.0℃:50.4 days, the maximum depth of the firn:17mm, the atmospheric pressure in winter:96,910p,the atmospheric pressure in summer: 95,300p, the time when appeared the lowest air temperature: 1977,1,30., the time when appeared the the highest air temperature:1971,7,27, the hottest month and the coldest month: July and January, the annual mean frost period:74 days.

4. The hydrology and the water system: The rivers in this county is of the Changjiang River catchment family belonging to the Wujiang River system. The rivers running in this area are mainly the Yinjiange River, the Chejiahe River, the Yangxihe River, and the Jiangyuanhe River, etc. The river net on the earth's surface is dense. Most of the rivers are the same with a steep upstream, a gentle midstream and a steeper downstream, cutting deeply and torrentially. These rivers, respectively, run from west to east, from south to north and from southeast to northwest, finally into the Wujiang River. The terrain of cutting in this area is much greater and the rivernet is dense. This area is comprised of highlands, flats and water area, etc., among them, the highlands occupy 93%. The total length in this area extends 457.5km and the density of the rivernet is 0.23 km/ km2, belonging to the Wujiang Hydrographic net. Of all the rivers, The Yinjiang River is the first rank tributary seminary of the Wujiang River, and it is 219 km long; the trunk Chejiahe River is 51.4 km long, and the total length of all its tributaries sum to 86.4 km. Yinjiang County abounds with water resource with the 20km2 rainwater harvesting area, 20 rivers of over 10km long of which 8 rivers have the riverbasin area of over 100km2, and the total length of 223km and , the annual total runoff volume of 1,250,000,000m3. The mean water volume is 4487/mu and there are 263 exposed springs and wells of which 136 are with the flow of 0.5 m/s and 76 springs and wells are used for irrigation. The underground water production rate is 12.9m3/km2, that is 12.5 more than the mean provincial level and 12.7 more than the mean rate of the Wujiang Hydrographic net. per capita The water resource per capita of the whole county is 3544m3, 31.3% more than the 2700m3, the whole nation level, and 26.7% more than 2820 m3, the Changjiang River Basin level. Because of so many hills and mountains rolling this area, these rivers drop height are so extremely great, so the hydroenergy reserves are very rich, the Proven waterpower generated energy can be 58,700kw of which there 87,500,000km occupying 14.9% of the total reserve. What's more, there are 4 underground springs with the stable temperature of between 28℃and 56℃, these springs still remains to be exploited to use.

5. The soil and the vegetation:

The present situation of soil and land use: In this project area are some types of soils, such as red soil, yellow soil, paddy soil, etc. The yellow soil and red soil are regional types of soils in this project area and the distributions of them are as: the red soil is along the land with altitude of under 500m, the yellow soil scatters along the highland with altitude of 500— 1400m and the paddy soil is around the population relatively concentrated areas, such as towns or townships and villages, etc. According

to the statistics information, Yinjiang County occupies an area of 1819.2km2. Of all the area, the farmland occupies 18994hm2 that is 10.44% of the total,; the garden plot occupies 8950hm2 that is 4.92% of total; the grassland occupies 8072hm2 that is 4.44%; the woodland occupies 102199.03hm2 that is 56.17% of total and the land for residence and mining occupies 8025hm2 that is 4.41% of total, the land for traffic occupies 451.3hm2 that is 0.25% of total, and water area occupies 206.1hm2 that is 0.11% of total, the unexploited rest occupies 35022.75hm2 that is 19.25%.

The Vegetation: The vegetation in the project area belong to Guizhou medium mountain evergreen oakery original limestone, evergreen defoliating mingled forest, and Chinese red pine, etc. The representative vegetation are limestone broad-leaf forest Rattan thorn bushes. The native vegetation has been appearing into retrogressive succession because of the constant overcutting and destruction. The exsiting are coniferous forest, sparsing bushwood, hassock, evergreen leafy mingled forest, defoliating broad-leaf forest, Rattan thorn bushes, etc. Of the vegetation here, the cultured vegetation is much more extensive than natural vegetation, and thus, the cultured woodland runs to an important proportion. The forest area in Yinjiang County stretches 102199.03 hm2. Of all the area, there is 76867.42hm2 for woodland, 10538.75hm2 for shrubbery, 1197.81hm2 for open forest land, and 3880.56hm2 for no-forest woodland; the forest coverage rate is 48.05%, the standing forest stock reaches nearly 2,772,400m3. On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild plants that are in imminent danger.

6. Animals: Because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information and the related surveys, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3. 2. 7 Sinan County

1. The geographic location: Sinan County lies in the east part of Guizhou Province and is under the administrative jurisdiction of Tongren district. The geographic place lies at east longitude 107° 52′ - 108° 28′ and north latitude 27° 32′ - 28° 10′ . Sinan County lies in the hinterland of Mount Wulilng and in the center of the Wujiang River catchment with the adjacencies of: the national level nature protection area, Mount Fanjing, on the east, the famous historical cultural city, Zunyi, on the west, the spring spot Shiqian on the south and along the Wujiang River northward through Pailing, Chongqing, and finally into the Changjiang River. This county, with Tongzun Speedway running through from the east to the west and the gold lode, the Wujiang River flushing from the south to the north, is the northeastern Guizhou amphibious transportation fort connecting Chongqing and Szechwan. The county, with its beautiful scenery and mild climate and rich land, stretches 2230.5km2 and administers 13 towns and 14 townships in which there are 17 peoples, such as Han and Tujia, Kelao, Mongolian, etc. for a total population of 640,000. As the main river of the Wujiang River running through Sinan County for 78.13km, there thus forms the natural charming landscape cutting down between the Dalowshan Mountain Range and the Wuling mountain range and finally forms the unique karst landform and relief.

2. The landform, relief and geography: Sinan Couty lies in the northern edge on

the large transitional slope the connecting Guizhou plateau to the west Hunan, and between the Dalowshan Mountain Range and the Wuling mountain range. As conditioned by the conformation, lithology and the Wujiang Hydrographic net, the landform of the county is comprised of a variety of reliefs and landforms, such as peak cluster, highland, gentle hilly valley, stream valley, and stone forest, etc. The culmination in this area is Zhangziyan, with the elevation of 1434m, in the southeastern edge, and the nadir is in the north where the Wujiang River running out of the couty, with the elevation of 343m. The relative altitude difference is 1091m. The landform in this county are mainly highland and upland.

To talk about the geological structure, this county lies in the western edge of the xuefeng ancient land stable platform, it is regionally in northeastward structural deformation zone in the north of Guizhou, at Fenggang in Tailong Zunyi Broken Arch. Therefore, Sinan County has the rupture and fold development of geographic and relief. The structure system is comprised of two mainsystems: NNE and NE, of them, the NE is the major. It was formed in yanshanian, of approximately parallel listed folds and High Angle fractures, with the appearance of wiggling structure of series of the Chinese character "多". These folds and ruptures bend eastward like an "S", the bending part develops extensionally and tension shear structurally, with the syncline open and the anticline narrow. The main folds are Xujiaba syncline, Tangtou syncline and Yingwuxi anticline; and the main ruptures are Daheba and Shiqian compressional fractures. The minor conformation is the NE structure, including a series of approximately parallel compression shear fractures. In the county are mainly Sinan compression shear fracture and Tangtou compression shear fracture. The two are both regional large compression shear fracture.

Sinan Couty lies in the northern edge on the large the Guizhou plateau transitional slope connecting to the west Hunan, and between the Dalowshan Mountain Range and the Wuling mountain range. As conditioned by the conformation, lithology and the Wujiang Hydrographic net, the landform of the county is comprised of a variety of reliefs and landforms, such as peak cluster, highland, gentle hilly valley, stream valley, and stone forest, etc. The culmination in this area is Zhangziyan, with the elevation of 1434m, in the southeastern edge, and the nadir is in the north where the Wujiang River running out of the couty, with the elevation of 343m. The relative altitude difference is 1091m.

According to the inside and outside stress of the relief forming and the earth's surface form, the reliefs in this area can be classified into 4 types, namely, structural erosional corrosional low-medium mountains, karst hilly and valley, structural erosional corrosional down mountains and erosion piled up. The exposed stratum in this county, from old to new, are repectively of Cambrian system, Ordovician, silurian system, The next generation and distribution as well as the system, Permian System and Triassic system in middle. The most extensive exposed are Triassic and Permian System, the minor are silurian system and Ordovician, the quaternary system are sporadically distributing. The missing stratum are devonian system, carboniferous system, Jurassic systerm and cretaceous, etc.

3. The climate and weather: The climate in Sinan County belongs to the subtropical monsoon wetn climate with the winter and the summer long and the spring and the fall short, and the weather in Sinan is mild with the flood season full of rainstorm, shower and thundershower. The rainstorms happen in June and July and last for 3 days. As the difference in temperature between the day and the night is so large, the night rains often happen. The mean precipitation for many years is 1134.4mm, the annual mean air temperature is 17.3℃， the summer utter highest air

temperature is 41℃, the winter utter lowest air temperature is-5.5℃， and the annual relative humidity is 7.6%. The annual sunlight period is 1248.4 hours with the sunlight rate of 27% , the mean frost-free period is 290 days, the perennial dominant wind direction is S.

The hydrology situation

4. River system: The Wujiang River runs from High Beach, the southwest of the county, into this area, through Wenjiadian, Wayaozui, Fengqing, Silin, Liangjiakou, Shaojiaqiao, the County seat and Tongjin, and finally out of the this county at Maixiexi, in the north of the county, with the total length of 78.13km and width of 60~ 110m. The Shiqianhe River runs into the Wujiang River at Liangjiangkou, with the total length of 37km and the width of 5- 6m. The Liuchihe River runs into the Wujiang River at Tongkou, the length it runs in the counth is 43.4km, and the channel is 5m wide. There, thus, form 18 well-conditioning wharfs. And this facilitats the water carriage greatly.

5. The soil and the vegetation

The soils in the project area and the areas nearby are mainly yellow soil and yellow brown soil, the minor is paddy soil. The horizontal zonal soil is yellow soil and the vertical zonal soil is yellow brown soil. The yellow soil and yellow brown soil develop under the condition of subtropical monsoon climate, and Rich aluminized role appears intensively, the development arrangement is distinctive. PH is 6.5.

The vegetation condition:The vegetation in the project area are subtropical evergreen broad-leaf forest and defoliating mingled forest, but there is not any of the original the earth's surface vegetation, however, the subfault bushwood and the grass vegetation grow well. According to the on-site survey, the plants in the project area are mainly: stink bug, acacia, Betula luminifera, cryptomeria, China fir, etc. Among them, stink bug, China fir are of the vernacular tree species and mainly the colonizing tree species; the bushwood are mainly buckthorn, Rosa cymosa, etc; the wild pasturage is mainly of the grass family composite, Leguminosae sedge family and Lip type section, etc.

3.2. 8 Shiqian County

1. The geographic location: Shiqian County lies in the northeast part of Guizhou Province and the central part of Tongren district. The geographic place lies at east longitude 107° 44′ 55″ —108° 33′ 47″ and north latitude 27° 17′ 5″ —27° 42′ 50″ , on the transitional slope from the west of Hunan to the Yungui plateau. The distance from east to west is 86.6km and the distance from north to south is 47.6km. The area is 2173 km2. This county, bordering: on Jiangkou County and Cengong County on the east, Zhenyuan County, Shibing County on the south, Fenggang County and Yuqing on the west and Sinan County and Yinjiang County on the north, includes 7 towns and 11 townships. This county is a traditional mountainous agricultural county.

2. The landform relief, geography: Shiqian Couty lies in the northern on the large Cascade transitional shaped slope connecting Guizhou plateau to hilly land of the west Hunan, at the southwest edge of the Wuling mountain range and it is famous just because of the Rock Screen standing distinctively. Shiqian County is of the south China isolated hill system with the Mount Wulilng area on the east and the Miao Mountain area on the west. In this county, there are many mountains and hills, forming the specific relief with variety of landforms (mainly highland). There are highland, mountain plateau, and also some down mountains, uplands, small basins in the mountains, valley terrace, these valleys intersect each other and valley Hillslope smashed, there are corroded hills, needle karsts, valley and also some eroded ridges

and valleys. According to the classified cause of formation of the relief, the landform of the whole county are mainly karst and erosion relief. There is a complete series of karst shapes: karst funnels, depressions, valleys and underground rivers are easy to see everywhere. The relief types in Shiqian County are complex with highlands of mainly the medium mountains in the south and west, mountain plateau region in the southwest, down mountains and uplands in the center, along the Longchuan River, down mountains and uplands and trough valleys in the northwest, along the Yuqing River. The terrain tilts from southeast to northwest and Mount Foding, standing in the south, is the culmination of the whole county with the altitude of 1869.3m. High Beach, where the county borders on Fenggang County, is the nadir of the whole county with the altitude of 388.3m.

3.The climate and weather: This area has the subtropical monsoon wetn climate with four distinctive seasons, and this area enjoys water, heat， sunlight and suitable temperature simultaneously. The weather here is no too hot in the summer and nor too cold in the winter. It is cool and wet in spring and fall. It is often Overcast and rainy and the sunlight time is short. It often occurs cold spell in later spring and drought in the later summer. The annual mean temperature:17.6℃， the extreme highest air temperature: 41.1℃， the extreme lowest air temperature:- 6.9℃,precipitation: 1087.4mm, the whole year's sunlight hours:976.7 hours, annual frost-free period extends 327days, the annual mean wind speed: 2.7m/s, the dominant wind direction in summer: S, the dominant wind direction in winter: NE, the annual average relative humidity:78% .

4. The hydrology: The rivers in Shiqian County is of the Changjiang River Basin, the northern part is of the Chishuihe River river system, and the southern part is of the Wujiang Hydrographic net. The annual mean quantity of precipitation in the whole county is 950～1100mm, the annual mean depth runoff is 450～550mm. The quantity of precipitation 3,672,000,000 m3, and the mean reserve of the total groundwater reserve for many years is 507,000,000m3. The Baoxihe River, the first ranked tributary of the Wujiang Hydrographic net, the second ranked tributary of the Shiqianhe River, runs through Shangyao Village and Zhongjiaping, Pingshan Township, and then in Shuangxi Village, Zhongba Town, into the Baiyanhe River and finally into the Shiqianhe River. It has the length of 26.4km and the the riverbasin area is 101.2km2, the river sloping is 3.8‰; The main river of the Shiqianhe River is 117km long and the riverbasin area is 2128km2, the mean flow at the estuary for many years is 44.7m3/s, the natural drop height is 502m, theoretical hydroenergy reserve is 10,000kw.

5. The soil and the vegetation

There are 6 soil types in Shiqian County, namely, yellow soil, limestone, highland yellow brown soil, purple soil, moisture soil and paddy soil, they are classified into 17 subgroup, 4soil genus and 10soil species. Among all the types of soil, the area of yellow soil is the largest, that is 63.1% of the total area; the second, limestone, is 46500 hm2, that is 22.5% of the total area; the area of paddy soil is 20900 hm2, that is 10.2% of the total; the area for forestry using, mainly comprised of yellow soil developed from sandshale, the minor ones are lime soil developed from limestone and the least is purple soil from sandshale. The highland yellow brown soil mainly ditributes in Mount Foding area and Mount Dading area.

Shiqian County lies in mid-subtropical areas, evergreen broad-leaf forest zone, and the vegetation types are throng, but remain few native vegetations, the most are subfault vegetation, the dominant are coniferous-broadleafy mingled forest. The patches for them respectively are not distinct. The native vegetation remain only in

Mount Foding area and Mount Dading area.

3.2. 9 Nayong County

1. The geographic location: The project is planned to be carried in Nayong County. Nayong County stretches from east longitude 104° 55′ 40″ — to east longitude 105° 38′ 04″ and from north latitude 26° 30′ 16″ — to north latitude 27° 05′ 54″ . This county lies in northwes of Guizhou Province, southeast on Bijie district, and is shaped like a goat with its head in the west and its tail in the east, lying at the foot of Wumeng Mountain System, between the Liuchonghe River and the Sanchahe River. This county borders on: Zhijin County, LiuZhi County on the southeast, Shuicheng County on the southwest, Bijie city and Hezhang County on the northwest and Dafang County on the northeast. The distance from the east to the west is 56km and the distance from the north to the south is 48km, and the total area is 2448km2. (See attached Figure1)

2. The landform, relief and geography: Nayong County lies in the west, is part of the Qianxi mountain plateau, the second ladder of the Guizhou plateau. It is in the (Yungui plateau to Qianzhong mountain plateau) transitional region, with the higher northwest and the lower southeast, the mountain range in this area appears like the letter: L, extending from the northwest to the southeast. The southeast branch of Jiucaiping ridge, of which the peak, lying in Hezhang County, has the highest altitude in the whole province, runs into this area from the northwest and through Mount DaLaikebao and Shiren Big Ridge and Kunzai ridge, forming a line and it extends to the center and the southwest contiguous with Mazongling, Doupengqing, Saozuo Mountain and Jieban Mountain traversing the southeast and then inclining in two ways respectively toward northeast and southwest. The eastern area to the northeast of Longchang Town is a "more"- like series of Fold fractures, with river colored syncline, Lezhi syncline and Luzui syncline, etc., belongs to Huaxia type structure. The western area to the northeast of Longchang Town is NE parallel diagonal fold fracture, with Baogushan anticline, Yinchanggou anticline, Saozuo anticline,and Doupengqing anticline , belongs to Huaxia type structure. The peak in Nayong County is Mount Dalaikebao, lying in the West with altitude of 2476.40m, and the nadir is Chahekou in HuangmaoZai, Lezhi Town, with altitude of 1052m. The mean altitude of Nayong County is 1684m, and the relative altitude difference is 1424m. Of the whole area of Nayong County, the part with relative altitude difference of over 400m occupies 534.97 km, that is 21.09% of total; that with relative altitude difference of 300－400m occupies 767.81km2 that is 31.40% of total, that with altitude difference of 200m－300m occupies 534.17km , that is 21.80% of total; and the rest hillock and valleys occupies 609.55km, that is 24.90% of total.

3. The climate and the weather: The climate in Nayong County belongs to warm temperate zone climate, with shorter cool summer and longer cold winter. The annual mean air temperature:13.7℃， the mean air temperature of the hottest month :22.3℃, the extreme high temperature: 33.0℃，and the utter low temperature :- 9.6℃. The annual mean quantity of precipitation is 1267.4mm, the annual mean rainy days(quantity of precipitation per day>=5.0mm)is 59.4days, the rainstorm days(quantity of precipitation per day>=50.0mm) is 2.8 days, the heavy rainstorm days (quantity of precipitation per day>=100.0mm) is 0.3 days. The annual mean sunlight time is 1486.4 hours that is 33% of the lightable hours. The annual mean wind speed is 1.6m/s, whole-yearly, the dominant wind is NE, and the S wind is prevalent in summer while NE wind is prevalent in winter. The annual frequency of calm wind is 36%.

4.The hydrology situation: There are 506 rivers, great or small with the total length of 820.8km, and the riverbasin area of 2420 m2, of all the rivers, the main ones with length of over 10km and the the riverbasin area of over 50km2 are 22, all the rivers intersect each other. The Zongxihe River and the Nayounghe River are the greater rivers in Nayong County, because of the intersection of ridges, the rivers distribut along the ground in east and west two ways: one is the Zongxihe River-the Guazhong River system from west to northeast with the the riverbasin area of 1739km2; and the other is from northwest to southeast forming the Nayonghe River Water Net, with the riverbasin area of 680.60.

The Zongxihe River originates from Hezhang County, running through Qixingguan, Bijie, joining with the Liuchonghe River at the downstream and finally into the Wujiang River. In Weixin District, The part of Zongxihe River, from Zongxihe River Bridge to the downstream, is 12km long.

5. The soil and the vegetation

Soil: There are too many types of soil in Nayong County, the area for the farmland: 1484521.4mu, the area for gardenland: 8370.4mu; the area for forest; the area for pasturage: 27190.7mu and the area for others: 316796.4mu. The major type of soil in Nayong County is yellow brown soil, with the area of 15.12 hm2 (2,268,300 mu), that is 57.30% of the total, the second is yellow soil with the area of 18.51% of the total, purple soil is to 12.01% and lime soil is 7.92%, and brown soil occupies 1.61% of total. Yellow soil, the main soil type in the project area develops under the condition of subtropical wet monsoon climate, and Rich aluminized role appears intensively, the development arrangement is distinctive. The yellow soil has a strong resistance to fouling and the scour resistance, and the PH of it is 6.0. The PH of subsoil can reach 6.0 or so. The thickness of the mellow soil layer is 0～ about 40cm, the thickness of the parent rock horizon is 30～50 cm.

The vegetation: The vegetation in Nayong County belongs to the wet broad-leaf forest zone of the middle part of Bijie District, the central vegetation belongs to medium mountains valley wet evergreen oakery, evergreen and defoliating mingled forest, Chinese red pine, sumach, walnut woods zone. Much of the native vegetation has been destroyed, replaced by many types of the subfault vegetation. At present, area-wholy, the land for forestry occupies 72342.5 hm2, that is 29.6% of total; the land for woodland occupies 41346.7hm2, and the forest coverage rate is 16.89%.

The native vegetation in the project area has been destroyed, and the proportions of the vegetation are mainly subfault vegetation, farmland vegetation and cultured vegetation. These kinds of vegetation include Chinese red pine, China fir, cryptomeria, shrub, herbage, etc and , tea leaf, paddy, mealie, potato, rape, vegetable and so on. On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild plants that are in imminent danger.

6. Animals: because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information and the related surveys, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3.2.10 Hezhang County

1. The geographic location: The project is planned to be carried out in Hezhang

County. The county lies in northwest of Guizhou, in the Mount Wumeng region--the transitional versant from the east Yunnan plateau, which is in the upstream area of the Wujiang River 's northern origin--the Liuchong River and thesouth origin--the Sanchahe River, to the Guizhou highland and hills. The county seat is 340km away from the provincial capital, Guiyang, 96 km away from Bijie Municipality, and 107 km away from Liupanshui Municipality. The 326national highway, running from the east to the west, comes into this county at Pingshan Township, westward through Weining County and then into Yunnan Province. There are some provincial level highways respectively, northward, southward and eastward to Zhenxiong COunty of Yunnan Province, Liupanshui Municipality and Nayong County, so the traffic in Hezhang County is very convenient.

2. The landform relief and geography: Hezhang County lies in the upstream area of the Wujiang River 's northern origin--the Liuchong River and thesouth origin--the Sanchahe River, under the Bijie district administration. Geographically, the county lies in the medium mountains canyon area of Qianxi plateau, in the transitional versant from the east Yunnan plateau to the Guizhou highland and hills with too many high mountains, steep slopes and intersecting deep rivers and valleys. Generally, the relative altitude difference is 500～ 700m,the highest altitude is 2900.6m, and Jiucaiping, lying Zhushi Yi Township, is the peak in Guizhou and famous as the "GuiZhou fastigium". The Yejihe and the Shajiehe, lying in Guda Yi Township, have the minimum altitude of 1230m. So the maximum altitude difference extends to 1670.6m. This area is cut by Mountains, such as Shehu ridge, Jiegou ridge, Sanwang ridge and Jiucaiping , with the higher northwest, southwest and the lower northeast. There are many mountains and hills and many deep intersecting rivers and valleys.

3. The climate and weather: Hezhang county seat belongs to north subtropical wet climate zone with the dry winter and spring and the wet summer and the winter is long and warm but the summer is cool with the water and heat simultaneously. The climate in this area is Plateau type warm and cool monsoon climate. the weather is mild and the precipitation is rich, the humidity is great. The annual medial humidity is 83% and the mean annual temperature:14.1℃， the mean air temperature of the coldest month, January:4℃ and the mean air temperature of the the hottest month July:22.5. the extreme highest air temperature: 33.5℃， and the the lowest air temperature :- 12.1℃. The sunlight time is much less and southeastern (SE) wind blows a lot, sometimes see the severe weather of congelation, hail and rainstorm, etc. According to the information collected in 1988-2001 by Hezhang Weather Bureau, in this area: the annual mean quantity of precipitation:1000- 1200mm, the maximum annual precipitation: 1300mm, the minimum annual precipitation:800mm, the proportions of quantity of precipitation each year is not even. The rainy season lasts from June to September, the quantity of precipitation in this period occupies 77% of the whole, the 11th-the 3th month is low water season, in which the quantity of precipitation occupies only 10% of total.

4. The hydrology situation: The rivers in Hezhang County belong to the Wujiang Hydrographic net and the Wujiang River catchment of the Changjiang River Basin. The Wujiang Hydrographic net can be classified into two small catchments, the Liuchonghe River catchment and the Sanchahe River catchment. The the Liuchong riverbasin area is 479km2 and the riverbasin area of the Sanchahe River catchment is 479km2, The total area of the riverbasin area is 2609 km2, the two riverbasin areas are respectively occupy 64.8% and 14．8% of total. The total riverbasin area of the Liuchong river basin area and the Sanchahe river basin area of the the Wujiang River

basin is 79.6% of the total of the county; The main rivers and tributaries in Hezhang County are numbered to 19 with the total length of 357km. The Luozehe river basin area of the Hengjiang River basin area is 526.63 km2, that is 16.2% of the total of the county.

5. The soil and the vegetation

The earth in Hezhang County have many types，they can be classified into 9 types, 17 subgroups, 49 soil genuses and 119 soil species . The soil area is 263,900hm2, occupying 81.3% of the total. Of them, the natural soil:167,600, occupying 51.7% of the total, The dry soil： 93,400hm2，occupying 28.6% of the total， paddy soil：29,000hm2.occupying 0.9% of the total. The major type of soil in Hezhang County is yellow brown soil, with the area of 15.12hm2(2,268,300mu), that is 57.30% of the total, the second is yellow soil with the area of 18.51% of the total, purple soil is to 12.01% and lime soil is 7.92%, and brown soil occupies 1.61% of total. Yellow soil, the main soil type in the project area develops under the condition of subtropical wet monsoon climate, and Rich aluminized role appears intensively, the development arrangement is distinctive. The yellow soil has a strong resistance to fouling and the scour resistance, and the PH of it is 6.0. the PH of subsoil can reach 6.0 or so. The thickness of the mellow soil layer is 0~ about 40cm, the thickness of the parent rock horizon is 30~ 50cm.

Hezhang County is of the northwest plateau evergreen oakery,Yunnan Pine wood, sumach, walnut wood zone and Hezhang-Shuicheng plateau highland evergreen oakery Yunnan Pine and karst vegetation region. The native vegetation in the project area has been destroyed, and the proportions of the vegetation are mainly subfault vegetation, farmland vegetation and cultured vegetation. These kinds of vegetation include Yunnan Pine, Chinese red pine, China fir, sumach, walnut, shrub, herbage, etc and, tea leaf, paddy,, mealie, potato, rape, vegetable and so on. The woodland area in Hezhang County reaches 148,000hm2, and of all the area, forest land: 55,000 hm2, open forest land:81.000 hm2 and thenon-forest land: 11,500hm2, and the forest coverage rate is 37.4% . On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild plants that are in imminent danger.

6. Animals: because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information and the related surveys, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3.2. 11 Weining County

1. The geographic location: Weining County, the largest county in Guizhou, lies in the west of Guizhou Province. It has the most extensive area, the highest altitude and the largest population in this province. It includes 35 towns or townships with a total area of 6298km2. The mean altitude is 2200m and the forest coverage rate is 33.28%. The population in the late year 2012 was 1435,000. In the county live 1435,000 people, among them, the minor peoples are numbered to 336,000, and the minor peoples are mainly Yi, Hui, Miao, etc. 19 in total. It is the sole Three - Peoples autonomous county in the province. Weining Yi, Hui and Miao Autonomous County lies in the northwest of Guizhou province and it borders on Yunnan Province on north, west and south. The total area of the county is 6296.3km2 and the mean altitude is

2200m. The Autonomous County lies in the northwest of Guizhou province, in the east longitude 103° 36′ —104° 104° 45′ and north latitude 26° 36′ —27° 26′ . and it borders on Yunnan Province on north, west and south and is the Traffic crossroads of the Yun, Gui and Chuan three provinces. It is well known as the West Gate of Guizhou Province. The distance from the east to the west is 105km and the area is 6296.3km2, The County is 365km away from Guiyang, and the traffic is very convenient.

2. The landform, relief and geography: Weining County lies on the plateau surface of Wumeng Mountain Ridge, and is the upstream watershed of the Changjiang River and the Zhuiang River and is the origin of the Wujiang River. The mean altitude is 2200m, known as the "GuiZhou fastigium". In Weining, The mountains are high and the rivers are beautiful, there are many deep valleys and unique gorges. There is a extensive tilt from the west to the east and therefore, Weining is the largest plateau highland in Guizhou. In this area there are many rupture s of the crustal derm and dense high mountains and gorges; the central fault folds are small and the lithosphere distictively lifts forming the plateau with gentle relief. There are wide karst gentle hills and upland swales, the landform appears as high center and low surrounds. There are too many mountains and intersecting rivers and valleys with steep terrain and sporadically fractured large heave of relief. The Wumeng Mountain Ridge runs Straight - through the whole area mainly in three directions. The highest altitude of this area is 2879m and the lowest point altitude 1234m， and the altitude difference is 1645m. The vein in the east ridge of the Wumeng Mountain Ridge is not clear, and the peak, Mount an has the altitude of 2835.9m. The middle ridge runs from Saofudoumuxion ridge, through Niujiexiaozhangguan to Mount Xiliang, southward it stretches to Mabai Mountain, The peak is Mount Xiliang with the altitude of 2860m. The west ridge of the Wumeng Mountain Ridge runs from Liangfengtai, Zhaotong district, through Mount Mawo and southward to Mount Longtou. There are two Peaks, one is the Pingqing Ridge on the north side of Mount Longtou with the altitude of 2879.6, and the other is Shuanbaoyan Rock with the altitude of 2835 m.

3. The climate and weather: Weining County is of subtropical plateau monsoon climate, the annual mean temperature is 10.5℃， the mean air temperature of the coldest month(January):1.9 ℃ ， and the mean temperature in the hottest month(July):17.7℃. The utter cold temperature:- 15.3℃, The utter high temperature: 32.3℃: The annual mean precipitation 950.9mm, The sunlight time per year:1805.4 hours; The frost-free period 280 days; the annual relative humidity 80% ; the annual mean wind speed:3.2 m/s; the perennial dominant wind direction : SE and frequency:19% ; The second dominant wind direction: N,frequency:19% ; the annual calm wind frequency 13% . In this area often see drought in winter and spring, rain in summer. It is cold in winter with congelation and the summer lasts short but is cool with suitable weather, therefore it is worth being called the Spring City on the plateau.

4. The hydrology situation: The rivers in Weining County, great or small, are intersecting one another with the total length of 1031.1km. The total length of the main rivers is 368.5km. The three big rivers, namely, the Niulanjiang River in the west, the Luozehe River in the north and the Ertanghe River in the east, are of the Changjiang River system. The Keduhe River is of Zhu River system. Among all the rivers, the medium ones with length over 10 km respectively belong to the four great river systems: the Baipanjang river system(the Xiaokedu River,the Maza River, the Wenchang River and the Julexiaohe River), the Niulanjiang River system(the Halahe River, the Andan River, Qiaxihe RIver, the Shuixihe River, and the Chongzihe River,

the Chahe River, the Chazihe River, the Wazahe River and the Baiwanhe River), the Hengjiang River system(the Yangjiehe River, the Sandaohe River, the Xinglonghe River, the Tuoluohe River, the Heituhe River and the Shizihe River)and the Wujiang Hydrographic net (the Gongqiaohe River, the Wenminghe River, the Tuoluochong River and the Lexi River). The drainage density is 16.4/km2. The Keduhe River, called Cunshui or Pushui in the ancient time, is the boundary river of Weining and Xuanwei of Yunnan. It is of a high strategic status in through the history with many relics on both banks. The rivers running in the Caohai Region is of the Hengjiang River system and the 1st tributary of the the Hengjiang River, the Luozehe River originates from the Caohai Region and the Wujiang River originates from Banchang Village. Caohai, known as the bright plateau phearl, lies in the southwest to the county seat.

5. The soil and the vegetation

The earth in Weining County have many types, they can be classified into 9 types, 17 subgroups, 49 soil genuses and 119 soil species . The soil area is 263,900hm2, occupying 81.3% of the total. Of them, the natural soil: 167,600, occupying 51.7% of the total, the dry soil: 93,400hm2, occupying 28.6% of the total, paddy soil: 29,000 hm2. Occupying 0.9% of the total. The major type of soil in Hezhang County is yellow brown soil, with the area of 15.12hm2(2,268,300mu), that is 57.30% of the total, the second is yellow soil with the area of 18.51% of the total, purple soil is to 12.01% and lime soil is 7.92%, and brown soil occupies 1.61% of total. Yellow soil, the main soil type in the project area develops under the condition of subtropical wet monsoon climate, and Rich aluminized role appears intensively, the development arrangement is distinctive. The yellow soil has a strong resistance to fouling and the scour resistance, and the PH of it is 6.0. The PH of subsoil can reach 6.0 or so. The thickness of the mellow soil layer is 0~ about 40cm, the thickness of the parent rock horizon is 30~ 50cm.

The vegetation in Weining County is of Yun - Gui plateau semihumid evergreen broad-leaf forest zone and plateau highland evergreen oakery Yunnan Pine silva. The evergreen trees are Yunnan ZhuiLi, Yunnan yellow oak, flaucoides, Cinnamomum glanduliferum, and the deciduous trees are: Populus yunnanensis Dode, Salix cavaleriei, Yunnan park and Mengzi alder.

The conifer trees are mainly Yunnan Pine and Chinese White Pine. The most important in the economic forest is Cork forests.

The major fruit trees are pineapple, apple trees and malus asiatica. The native vegetation in the project area has been destroyed, and the proportions of the vegetation are mainly subfault vegetation, farmland vegetation and cultured vegetation. These kinds of vegetation include oakery, Yunnan Pine, Chinese White Pine, shrub, herbage, etc and, buckwheat, paddy, mealie, potato, rape, vegetable and so on. On the basis of the accumulated information, surveys and the related certification from the local Forestry Bureau, we haven't discovered any valuable and rare wild plants that are in imminent danger.

6. Animals: because of the constant activities of the human, the forest resources have decreased and the wild animals become rare, the exsiting animals are beasts and birds. The wild animals living in this area are mainly hares, squirrels, goats, snakes, grass carps, fish, loaches, and ricefield eels, etc; the animals belonging to the family of livestock and poultry are swine, cattle, sheep, horses, chicken, ducks, geese, rabbits, and bees. The cultured kinds of fishes are grass carps, cyprinoids and chub, etc. On the basis of the accumulated information and the related surveys, we haven't discovered any valuable and rare wild animals that are in imminent danger.

3.3 The social economic condition of the project area

According to the information from the year2013 statistics yearbook or the year 2013 leaders and cadres administration manual of all the project county, The social economic condition of the project area, see Table 3.3-1.

See Table 3.3-1 for the basic situation of each of the project county of the Guizhou Rural Development upon the World Bank Loan Project.

Table 3.3-1 The basic situation of each of the project county of the Guizhou Rural Development upon the World Bank Loan Project (Tho represents thousand**)**

item		Unit	Total	Wuchuan	Zheng'an	Daozhen	Nayong	Weining	Hezhang	Shiqian	Sinan	Yanhe	Yinjiang	Dejiang
1.the basic situation of the population														
Number of towns		nr	239	15	19	14	25	35	27	18	27	22	17	20
Number of villages		nr	3822	113	152	83	479	609	456	302	489	429	365	345
# The important villages in the anti-poverty project		nr	1974	89	115	83	317	362		183	335	283		207
Total number of households		nr	1948131	110449	172878	87666	252154	346781	199760	117525	191344	176987	138447	154140
#the number of farming households		hs	1667833	104659	149897	61830	238682	279159	180940	97939	174439	145543	126462	108283
Indigent households		hs	510108	48549	46714	24574	80378	113011		34850	63683	61897		36452
Total population		10tho.	733.23	45.61	65.05	30.31	97.91	143.79	79.15	41.29	67.71	66.10	43.76	52.56
Rural population	population	10tho.	656.72	41.45	59.33	29.71	92.67	130.26	71.55	37.64	53.00	60.70	40.14	40.27
	rate	%	89.57	90.88	91.21	98.02	94.65	90.59	90.40	91.16	78.27	91.83	91.73	76.62
Population of the Minor peoples		10tho.	282.27	44.04	4.24	26.74	22.64	33.76		33.30	32.84	43.69		41.02
Indigent population		10tho.	194.64	14.64	15.74	10.32	27.79	38.59		13.00	19.09	25.20	16.09	14.18
Population density		per/km2	241	164	251	141	400	228	244	190	304	268	222	254
2.comprehensive situation of the area														
GDP		￥10tho	5678183	282859	356286	247804	1030675	1008300	536428	315295	610363	391737	404133	494303
#primary industry total value		￥10tho	1736941	97960	131586	103827	121527	336994	162839	119548	194741	139013	155001	173905
farming		￥10tho	1250443	110096	146738	64550	70972	302255	100762	63605	117000	90995	79239	104231
farming		￥10tho	64639	5264	26619	5610	2866	3692	3085	3893	2592	2650	5694	2674
Stock raising		￥10tho	689563	46995	57463	32397	45787	185059	50630	47858	63615	36716	62469	60574
other		￥10tho	115190	3645	62651	1270	1902	55	8362	4192	10434	8652	7599	6428
Secondary industry		￥10tho	1596329	46359	66029	33338	594146	273838	143588	47969	144259	66421	83022	97360

Tertiary industry	￥10tho	2344913	138540	158671	110639	315002	397468	230001	147778	271363	186303	166110	223038
Rate of the above three		31:28:41	35:16:49	37:18:45	42:13:45	12:58:30	34:27:39	30:27:43	38:15:47	32:24:44	35:17:48	38:21:41	35:20:45
rural per capita net income	￥		4251	4333	3745	4561	4862	4577	4521	4335	3713	4369	4137
Poor households per capita income	￥		2160	2180	2140	2150	2200	2190	2150	2180	2100	2120	2110
3.land and resourse													
Total area	hectare	3043894	277755	259500	215597	244800	629980	325000	217240	223050	246880	196900	207192
#farmland	hectare	558248	61049	31157	51528	95638	71670	38344	22270	76000	26327	18593	65673
Per capita area	hectare	0.88	0.50	1.39	0.39	0.68	1.34	1.38	1.24	0.59	1.67	1.57	0.53
Area for woodland	hectare	1355478	116967	103800	147662	94941	239352	157000	129450	91293	116802	98117	60093
woodland	hectare	881200	91868	86321	59064	40512	233305	6000	99478	85027	61255	58870	59500
orchard	hectare	48323	1290	1781	7383		6047	693	19000	6267	2391	2878	593
grassland	hectare	258595	90900	3566	10779		296	2300	45899	15153	24920	11582	53200
Available grassland	hectare	198166	65894	2496	5389		296	1604	25394	15300	24920	8687	48187
Area of returning to forestry	hectare	117911	7527	10400	2589		20	38165	1465	20900	17110	9515	10220
Water area	hectare	52772	2180	2666	6759	224	28897	1753	2320	2967	2467	1435	1104
Available water area	hectare	20939	3989	1861	5407	1187	2323	436	420	2967	329	1148	872
wasteland	hectare	303374	32800	36828	64679	47377	6614	10000	3503	21606	51692	1153	27122
Available wasteland	hectare	154754	13599	25779	32340		5113	3046	2923	3121	36761	7934	24138
4.crop and pasture production													
Total crop area*	hectare	983429	86153	102984	62036	125301	210713	1398	75470	96475	82393	58640	81866
Total area for food*	hectare	644512	57247	70946	38167	94822	124749	9117	46270	58334	57259	36420	51181
Grain total output*	t	1741976	163758	212219	110893	228725	396321	95354	115356	228687	135794	127602	139486
Economic planting area*	hectare	271847	16330	18241	13135	30479	298	62650	29200	38141	22590	10100	30683
Dry fruit area	hectare	64240	10250	14671	2666	30		27231	2573	1180	70	5336	233

Dry fruit production	t	16863	592	108	2500	201		10572	2	177	283	2000	428
Fresh fruit area	hectare	19361	1290	712	4362	850		632	4020	2553	1583	2226	1133
Fresh fruit production	t	200450	4062	2750	13420	6375	19378	8865	35016	24623	61014	20780	4167
Area for other plants*	hectare	240280	12576	4156	10734	29599	58428	30887	46270		20937	22140	4553
Number of Large animals Year end	Tho.nr	951	10	57	37	133	213	91	58	124	65	42	63
Number of marketable fatten stock year end	Tho.nr	265	4	66	7	36	47	16	12	20	21	16	19
Swine number unmarketable year end	Tho.nr	3576	194	213	168	294	820	317	214	611	247	190	211
Number of marketable swines year end	Tho.nr	3149	204	248	197	238	622	281	202	406	270	254	228
sheep number unmarketable year end	Tho.nr	1196	82	41	31	134	243	140	38	142	202	3	141
Number of marketable sheep year end	Tho.nr	852	56	48	15	42	151	67	58	72	177	6	160
Number of unmarketable poultry year end	Tho.nr	10378	809	563	807	1648	1707	892	770	1429	764	475	515
Grassland area	hectare	226253	667	106666	8320	2867	18676	9536	1335	6000	420	10666	61100
Grass production	t	6499525	60000	1000000	199680	215025	1260000	865320	60000	360000	41500	240000	2198000
Meat production	t	362821	23117	22545	18198	32700	73731	32874	22575	53300	29548	27805	26428
Per capita food occupancy	kg	401	359	357	345	233	737	242	381	338	357	319	380
5.level of modernization in farming													
Water project storage	M^3	140444414	18810000	1300000	1800000	113621		143354	16033300	57080000	45160000	1553	2587
Effective irrigation area	hectare	104464		13666	6758	17400	1935	11320	5045	9840	3372	13495	21633
Farming area	hectare	84528	1438	31157	733	716		29624	1828	930	14968	1620	1514
Holding quantity of farming machine	nr	786675	600	102531	161000	6500		193	9200	286000	153753	14278	52620
Rural energy Consumption	kwh	888659743	74440000	73200000	2768	95857623	144090824	93217705	87810000	16875	14610	9338	320000000
Applying quantity of chemicals	t	5077693	4610000	13027	10691	79903	118930	53707	26077	54712	48605	24372	37669

3.4 Environmental quality status the Project Area

3.4.1 Zunyi municipality

This appraisal is on the basis of the existing information from conventional supervision instead of conducting the supervision for the environmental situation. According to the environmental monitoring data of the project counties (Wuchuan County, Daozhen County and Zheng'an County) provided in the year2012 Guizhou Province environmental quality report, Zunyi Municipality, in 2012, has the better Environmental Air Quality, which reaches the second rank of GB3095-1996--Environmental Air Quality Standard. As the project is to be carried out in the rural area, and no large industrial and mining establishments and no large air pollution sources discharging points have been found in the neighborhood. So the Environmental Air Quality is good and reaches the second rank of GB3095-1996--Environmental Air Quality Standard. The major rivers in Wuchuan County, Daozhen County and Zheng'an County(as Project area) are the Hongduhe River(belonging to the Wujiang Hydrographic net of the Changjiang River Basin) (with Changjiao as the monitoring section), the Furong River(with the Pond Bridge and Wangshui ferry as the monitoring section). The water quality monitoring at the above three monitoring sections reaches the first rank of GB3838-2002--surface water environmental quality standards, that is exceling the third rank of its water environmental function executive. The distribution of The river system in the project area(See Figure 1.1-1) and its water environmental function and water environmental situation (See Table 3.4-1); The sound environment:As the project is to be carried out in the rural area and the traffic flow is small and there are any large noise sources, so the sound environmental quality is good and can reach the class 2 regional standard of GB3096-2008--Sound Environmental Quality Standards with Leq60dB(A) in the day and Leq50dB(A) in the night.

3.4. 2Tongren municipality

This appraisal is on the basis of the existing information from conventional supervision instead of conducting the supervision for the environmental situation. According to the environmental monitoring data of the project counties (Dejiang County, Yanhe County, Sinan County, Yinjiang County, and Shiqian County) provided in the year2012 Guizhou Province environmental quality report, Tongren Municipality and Dejiang County, Yanhe County,Sinan County,Yinjiang County and Shiqian County, in 2012, has the better Environmental Air Quality, which reaches the second rank of GB3095-1996--Environmental Air Quality Standard. As the project is to carried out in the rural area, and large industrial and mining establishments and no large air pollution sources discharging points have been found in the neighborhood. So the Environmental Air Quality is good and reaches the second rank of GB3095-1996--Environmental Air Quality Standard. The major rivers in the De River County, Yanhe County and Sinan County(as Project area) are the main river of the Wujiang River(belonging to the Wujiang Hydrographic net of the Changjiang River Basin) (with Yanhe and Wuyangshu as the monitoring sections), the Longchuan River(with Lenglong as monitoring section) and the Yinjiang River(with Xiyan Temple as the monitoring section）. The quality monitoring at the above three monitoring sections reaches the first rank of GB3838-2002--surface water environmental quality standards, that is exceling the third rank of its water environmental function executive. While The water quality of the Yanhe monitoring section and Wuyangshu monitoring section of the Wujiang main river is under Class V, the total quantity of phosphorus is out of limits and can't reach the second rank of water environmental function executive. And the major reason for its overproof is that the rivers are polluted with the urban domestic sewage and the sewage discharging from the industrial and mining establishments in the upstream.

The project area distribution

Table 3.4-1 The river river system distribution and water environmental function and water environmental situation of The project planned to be carried out.

Table 3.4-1 The river system distribution and water environmental function and water environmental situation of The project planned to be carried out

River basin	Water system	River/reservoir	Project area	Length (km)	Controlling reach	Water function	Water quality situation	Supporting materials
The Changjiang River	The Wujiang River	The Yanggang	Wuchuan	49	Sanpu, Huangdu—Longtang-Daping	Ⅲ	ⅢUtilization rate low, good	Guizhou Province Water Function Zoning(2006)
		The Fengle	Wuchuan	65.1	Huangdu inlet—Hongduhe outlet	Ⅲ	ⅢUtilization rate low, good	Zunyi City surface water environmental function zoning, 2011, revision.
		The Hongdu	Wuchuan	54.3	The reach in Wuchuan	Ⅲ	ⅢUtilization rate low, good	Guizhou Province Water Function Zoning (2006)
		The Hongdu	Zheng'an	205	Xieba, Zheng'an - Shangguan, Hongdu	Ⅱ	Ⅱ Utilization rate low, good	Zuyi City surface water environmental function zoning, 2011, revision.
		The Furong	Zheng'an	43	Suiyang—the origin, Zheng'an	Ⅲ	ⅢUtilization rate low, good	
		The Furong	Zheng'an	1.1	the origin, Zheng'an—intake station downstream	Ⅱ	Ⅱ Utilization rate low, good	
		The Furong	Zheng'an	12.5	intake station downstream—downstream outlet	Ⅲ	ⅢUtilization rate low, good	
		The Furong	Daozhen	60.5	The whole reach ih Daozhen	Ⅲ	ⅢUtilization rate low, good	Guizhou Province Water Function Zoning(2006)
		The Mati	Dejiang	15	Naoshuiyan, Dejiang—Longquan	Ⅱ	Ⅱ Origin, good, good	
		The Mati	Dejiang	45	Longquan--Shuanglongchang	Ⅲ	ⅢUtilization rate low, good	Tongren District Surface water Environmental Function Zoning (1994) Guizhou Hezhang County Surface water Environmental Function Zoning Scheme (1993.3)
		The Yuxi	Dejiang	14	The origin—Matihe inlet	Ⅲ	ⅢUtilization rate low, good	
		The Yinjiang	Yinjiang	96	The origin—Yinjiang county seat	Ⅱ	Ⅱ Origin,good, good	
		The Yinjiang	Yinjiang Dejiang	20	Yinjiang County seat—Wujiang inlet	Ⅲ	ⅢUtilization rate low, good	
		The Shiqian	Shiqian	35	The origin—Shiqian county seat	Ⅱ	Ⅱ Origin, good, good	
		The Shiqian	Shiqian Sinan	82	Shiqian county seat-- Wujiang inlet	Ⅲ	ⅢUtilization rate low, good	
		The Wujiang	Sinan Shiqian	1037	Wujiang reservoir—Sinan	Ⅲ	ⅢUtilization rate low, good	
		The Wujiang	Sinan Dejiang Yanhe		Sinan—Yanhe outlet(in Guizhou)	Ⅱ	Because of pollution upstream of urban and industrial sewage	

							the section of the Wujiang in Yanhe County has overproof of total phosphorus to Class V, the other factors reach the standard	
		The Liuchi	Sinan	98.3	Shaojiaxi—Wujiang inlet	Ⅱ	Ⅱ Utilization rate low, good	
		The Chejia	Yinjiang Yanhe	81	The origin--Wujiang inlet	Ⅱ	Ⅱ Utilization rate low, good	
		The Caishen	Hezhang	16.2	Caishen, Shiyangou	Ⅲ	Good, reach the standardⅢ	
		The Yemachuan	Hezhang	6	Yemachuan, Dahuashui	Ⅲ	Good, reach the standardⅢ	Guizhou Hezhang County Surfacewater Environmental Function Zoning Scheme (1993.3)
		The Lijiagou	Hezhang	6	The upstream, Kele	Ⅲ	Good, reach the standardⅢ	
		The Hengjiang	Weining	393	Shanqiao, Caohai—Nianfeng, Shimen	Ⅲ	Good, reach the standardⅢ	Guizhou Weining Concentralizing Water Source Protection Zoning Report, 2005, 12
		The Heituhe	Weining	24	Lianhua, Tuone—Gaochao, Shimen	Ⅲ	Good, reach the standardⅢ	
		The Maliaohe	Weining	17	Gaofeng, Longjie—xinlong, Shimen	Ⅲ	Good, reach the standardⅢ	
	The Zhujiang River	The Maoshuihe	Weining	19	Shanqiao, Caohai—Kuadu,jinzhong	Ⅲ	Good, reach the standardⅢ	
		The Yanbianhe	Weining	12	Hekuai, Longchang—Longtan,Xinfa	Ⅲ	Good, reach the standardⅢ	
		The L Kedu	Weining	21	Qinglin, Longchang—Minzu,Xinfa	Ⅲ	Good, reach the standardⅢ	
		The Huangjiapo	Weining	12	Hongqi,Xinfa—Hongfeng, Xinfa	Ⅲ	Good, reach the standardⅢ	
	The Wujiang River	The Liuchonghe	Nayong	80	Luozai, Yangchang—Daying, Shabao	Ⅲ	Good, reach the standardⅢ	Guizhou Nayong County Surfacewater Environmental Function Zoning Scheme (1993.9)
		The Yingdihe	Nayong	60	Suga, Zuojiuga—Dadi,Weixin	Ⅱ	Good, reach the standard Ⅱ	

(See Attached Figure 1.1-1) and water environmental function, water environmental situation, see Table 3.4-1 for details. The sound environment: As the project is to be carried out in the rural area and the traffic flow is small and there are any large noise sources, so the sound environmental quality is good and can reach the class 2 regional standard of GB3096-2008--Sound Environmental Quality Standards with Leq60dB(A) in the day and Leq50dB(A) in the night.

3.4.3 Bijie municipality

This appraisal is on the basis of the existing information from conventional supervision instead of conducting the supervision for the environmental situation. According to the environmental monitoring data of the project counties (Nayong County, Hezhang County and Weining County) provided in the year2012 Guizhou Province environmental quality report, Bijie Municipality, Nayong County, Hezhang County Weining County and, in 2012, has the better Environmental Air Quality, which reaches the second rank of GB3095-1996--Environmental Air Quality Standard. As the project is to carried out in the rural area, and large industrial and mining establishments and no large air pollution sources discharging points have been found in the neighborhood. So the Environmental Air Quality is good and reaches the second rank of GB3095-1996--Environmental Air Quality Standard. The major rivers in Nayong County, Hezhang County and Weining County (as Project area) are the the Liuchong River (belonging to the Wujiang Hydrographic net of the Changjiang River Basin) (with Daqiaobian and Masangping as the monitoring sections), the Dahe River (with Yanchang as the monitoring section). The quality monitoring at the above three monitoring sections reaches the first rank of GB3838-2002--surface water environmental quality standards, that is exceling the third rank of its water environmental function executive. The distribution the system in the project area (See Figure 1.1-1) and its water environmental function and water environmental situation (See Table 3.4-1). The sound environment: As the project is to be carried out in the rural area and the traffic flow is small and there are any large noise sources, so the sound environmental quality is good and can reach the class 2 regional standard of GB3096-2008--Sound Environmental Quality Standards with Leq60dB(A) in the day and Leq50dB(A) in the night.

3.5 Relation with sensitive and protected areas

According to the on-site survey, the collected information and the Certification from the local administration, there are no sensitive protection areas, such as nature protection area, places of interest, culture relic protection sites, water source conservancy, etc. in this Guizhou rural development project area, and no valuable and rare wild animals that are in imminent danger haven't been discovered. See Table 3.5-1 for details.

Table 3.5-1 The project area whether or no involving sensitive area.

No.	Project County	Sensitive area	Whether or not the project area involve sensitive protected area	Verifying of the competent department
1	Wuchuan	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Wuchuan County Forestry Bureau
		Places of interest, forest garden,	No	Wuchuan Housing and

		geological park		Urban and Rural Construction Bureau
		Culture relic protection sites	No	Wuchuan Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Wuchuan Environmental Protection Agency
		Basic farmland protection area and mining	No	Wu chuan Administration of Territorial Resources
2	Zheng'an	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Zheng'an County Forestry Bureau
		Places of interest, forest garden, geological park	No	Zheng'an Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Zheng'an Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Zheng'an Environmental Protection Agency
		Basic farmland protection area and mining	No	Zheng'an Administration of Territorial Resources
3	Daozhen	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Zheng'an County Forestry Bureau
		Places of interest, forest garden, geological park	No	Daozhen Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Daozhen Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Daozhen Environmental Protection Agency
		Basic farmland protection area and mining	No	Daozhen Administration of Territorial Resources
4	Dejiang	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Dejianag County Forestry Bureau
		Places of interest, forest garden, geological park	No	Dejianag Housing and Urban and Rural Construction Bureau

		Culture relic protection sites	No	Dejianag Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Dejianag Environmental Protection Agency
		Basic farmland protection area and mining	No	Dejianag Administration of Territorial Resources
5	Yanhe	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Yanhe County Forestry Bureau
		Places of interest, forest garden, geological park	No	Yanhe Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Yanhe Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Yanhe Environmental Protection Agency
		Basic farmland protection area and mining	No	Yanhe Administration of Territorial Resources
6	Yinjiang	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No Not find	Yinjiang County Forestry Bureau
		Places of interest, forest garden, geological park	No	Yinjiang Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Yinjiang Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Yinjiang Environmental Protection Agency
		Basic farmland protection area and mining	No	Yinjiang Administration of Territorial Resources
7	Sinan	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Sinan County Forestry Bureau
		Places of interest, forest garden, geological park	No	Sinan Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Sinan Administration of Culture, Sports, Radio Sinan And Television and Tourism
		Fresh water origin protection area	No	Sinan Environmental

				Protection Agency
		Basic farmland protection area and mining	No	Sinan Administration of Territorial Resources
8	Shiqian	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Shiqian County Forestry Bureau
		Places of interest, forest garden, geological park	No	Shiqian Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Shiqian Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Shiqian Environmental Protection Agency
		Basic farmland protection area and mining	No	Shiqian Administration of Territorial Resources
9	Nayong	A . Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Nayong County Forestry Bureau
		Places of interest, forest garden, geological park	No	Nayong and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Nayong Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Nayong Environmental Protection Agency
		Basic farmland protection area and mining	No	Nayong Administration of Territorial Resources
10	Hezhang	A. Natural protected area B. The national protected wild animals and plants That are in the danger of dying out and the famous Woods and historical trees	No no	Hezhang County Forestry Bureau
		Places of interest, forest garden, geological park	No	Hezhang and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Hezhang Administration of Culture, Sports, Radio Hezhang And Television and Tourism
		Fresh water origin protection area	No	Hezhang Environmental Protection Agency
		Basic farmland protection area and mining	No	Hezhang Administration of Territorial Resources
11	Weining	A. Natural protected area B. The national protected wild animals	No no	Weinign County Forestry Bureau

		and plants That are in the danger of dying out and the famous Woods and historical trees		
		Places of interest, forest garden, geological park	No	Weinign Housing and Urban and Rural Construction Bureau
		Culture relic protection sites	No	Weinign Administration of Culture, Sports, Radio And Television and Tourism
		Fresh water origin protection area	No	Weinign Environmental Protection Agency
		Basic farmland protection area and mining	No	Weinign Administration of Territorial Resources

3.5.2 The relation between the project planned to be carried out and nature protection area

In the project area are 3 national level and 3provincial level and 6 county-level nature protection area. All the projects (including subprojects) is not in the nature protection area (See the attached information) and the construction and the operation of the projects involve no the protection of the nature protection area. The boundary relation between the area for the project planned to be carried out to the nearest nature protection area. See Table 3.5-2 and Attached Figure 2.3-1~ Figure 2.3-11.

As known from Table 3.5-2, the projects less than 3km away from the protected area are only in four counties: Daozhen County, Wuchuan, Yinjiang County and Weining. Of them, Wuchuan involves Captive breeding sheep, Yinjiang County involves Circle of chickens, because these breeding run in form of confine, the projects will not have great influence on the nature protection area, as long as the projects are in strict accordance with the methods extermination of disease and insect pest and by taking scientific, safe and effective measures.

Table 3.5-2 The boundary relation between the area for the project planned to be carried out and the nearest nature protection area.

Name of the nature protection area	Location	Area(m^2)	Rank /level	Object of protection	Type of protection	Established time	Competent department	Direction and minimum distance from project area
Daozhen Dashahe protection area	Yangxi Town, Sanqiao Town and Luolong Town, Daozhen County	26990	Provincial	Cathaya,Chinese dove tree, Francois langur, etc	Wild animals and plants	1984	Guizhou Forestry Department	About 2km in the north
Mafulin protection area	Huangdu Town ,Wuchuan County	3170	County	Cephalotaxus fortunel, Chinese Yew	Wild plants	1999	Wuchuan Forestry Bureau	25km in the northwest
Mayanghe protection area	Huangtu Town, Ketian Town, Zhongzai Township of Yanhe County and Hongsi township of Wuchuan	31113	County	Francois langur and the environment	Wild animals	1987	National Forestry General Office	3km in the northeast
Mount Fanjing protection area	Jiangkou, Yinjiang, and Songtao, and Yongyi township and Xinye township of Yinjiang	41900	National	Forest ecosystem and spun gold, Chinese dove tree	Forest ecosystem	1986	National Forestry General Office	2km in the southwest
Yangxi protection area	Yangxi town, Yinjiang	13000	County	Forest ecosystem	Forest ecosystem	1999	Yinjiang Forestry Bureau	1km in southeast
Shijialing protection area	Muhuang Town, Xinye Town ship and Yongyi Township	8815	County	Forest ecosystem	Forest ecosystem	1999	Yinjiang Forestry Bureau	1km in the southeast
Shiqian Fodingshan protection area	Ganlu Township, Pingshan Township, Shiqian	12635	Provincial	Tulip tree, etc.	Forest ecosystem	1992	Guizhou Forestry Department	5km in the southwest
Sinan Siyetun protection area	Yangjia\ao, Qinggangpo of Sinan,	2859	County	Forest and the wild animals and plants	Forest ecosystem	1999	Sinan Forestry Bureau	50 in the west
Weining Caohai protection area	Caihai Town, Weining	12000	National	Valuable and rare birds with the Black-necked Crane as a representative and the ecosystem	Forest ecosystem	1985	National Forestry General Office	1km in the south
Weining Tuoda protection area	Xueshan Town, Weining	9393	County	White crown pheasant and the environment	Wild animals	1992	Weining Forestry Bureau	15km in the northwest
Nayong Tongsheng protection area	Nayong County	11398.22	Provincial	Chinese dove tree, Yu-Gui Quillwort and Dipentodon sinicus, etc. and the environment	Wild animals and plants	2014.1	Guizhou Forestry Department	8km in the south

4 ENVIRONMENTAL EFFECT ASSESSMENT OF INFRASTRUCTURE CONSTRUCTION PROJECT ACTIVITIES

The Infrastructure Construction Project of Guizhou rural development project will be implemented including

The rural highway construction including the rural industries road, the production sidewalk, the road tractor, the farm trail, the water conservancy construction including tanks, settling basin and cited ditches, the power supply system, the products vault and agricultural products market facilities construction, the manufacturing equipment, the office occupancy construction, the industrial upgrading and other projects. Construction period and operation period will have some adverse effect on the surrounding environment.

4.1 Environmental effect analysis the construction period

4.1.1 The environmental effect analysis and evaluation of the linear engineering construction period

This Linear Engineering mainly includes the rural highway construction, the water conservancy construction including tanks, settling basin and cited ditches and the power supply system.

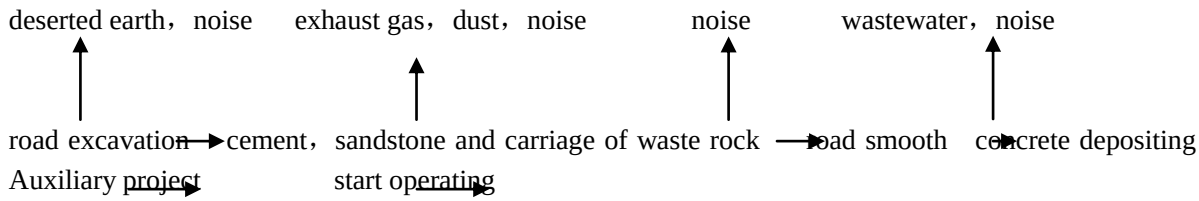
I. The environmental effect analysis and evaluation of the rural highway construction period

This project will invest 292,046,700 yuan in 11 counties to expand the rural industries road with 446.85 km long and 4.5 m wide, the production sidewalk with 351.18 km long and 3.5 m wide, the road tractor with 80.77 km long and 1.5 m wide and the farm trail or the sidewalk with 407km long and 0.8 m wide and so on to the cement concrete pavements. The implementation of the project construction and implementation of location -scale are detailed in Chapter 2 of this report Table 2.3-1. The entire project use the original road to alter and harden instead of adding new land and demolition. The environmental effect of road project works mainly in two phases of construction period and operation period. Environmental effect during the construction period is mainly the effect on the ecological environment, then a temporary effect on the surrounding environment caused by construction noise, waste water, dust and solid waste emissions and so on.

Environmental effects during the operation period mainly reflect on the vehicle running noise, exhaust effect on the ecological environment, acoustic environment and ambient air and the pollution to the surface water bodies caused by the rain washing the road. There are also the risks such as the transportation vehicle accidents rollovers and so on.

（I）Analysis of the construction process and product contamination

The project road is altered and hardened on the original road. The road hardening is redesigned to the base and the width of the road using only original road corridor and the construction program is consistent with the new road. Environmental effect of the road project during the construction period is mainly the effect on the ecological environment, then a temporary effect on the surrounding environment caused by construction noise, waste water, dust and solid waste emissions and so on. The effect of the project construction period activities is detailed in Figure 4.1.1-1 Highway reconstruction process flow diagram.



4.1.1-1 Highway reconstruction process flow diagram.

（II）The analysis of ecological environment effect during the construction period

The environmental effect of road construction on ecological generates mostly in the construction period. The ecological environment is destroyed mainly by occupying the main project, dividing land and changing the land-use to reduce the arable land and the forest area, decrease vegetation cover and increase the land-use pressure during the construction period. The construction of embankment filling and excavation and spoil field taking destroy vegetation and topography. That will cause soil erosion and change Soil fertility and aggregate structure in certain periods and certain areas. Besides, the engineering activities can break the original natural ecology and environment and be bad for the growth, distribution, rest and activities of plants and animals in this district.

1、The analysis of project area effect

The project will be hardened in the original road construction without occupying new land. There are no sensitive areas like nature reserves, scenic spots, drinking water source protection areas, cultural heritage, historical or cultural sites in the construction of the scope of the project. Therefore, the implementation of the project does not exist the influence of covering an area.

2、Effects on plants and vegetation resources

The works of all building materials are purchased without opening raw material yard and earth-fetching yard. All excavation earth work is backfill without setting the earth-wasting yard. That will not destroy the vegetation and make no difference to the vegetation. But there will be soil erosion unless the digging earth is backfill in time during the construction period. And construction dust may attach to the plant leaves along the road to stuff the leaf porosity and may affect the growth of plants around. Because there is no native vegetation but a small number of mason pine forests, fir forests and shrub forests and farmland vegetation such as fruit trees and corn, canola, potatoes, rice within the scope of the project evaluation, we cannot find rare endangered wildlife plants and ancient woods under the state protection along both sides of the road within 200 m. Therefore, project construction make a small difference to the plants and vegetation.

3、The effect on animals

The activity region, migration pathways, habitat area and foraging range of the terrestrial animals can be limited because of the road construction. However, this project is only hardened to improve the quality of road reconstruction project on the original road and the area is not the wildlife habitat, so wo don’t find the wild endangered animals. Local residents occasionally see rabbits, voles and so on. Therefore, the project implementation has little effect to the wildlife habitat. As barriers, the roads have little effect to their migration activities. Route of this project isn’t the scope of migratory birds’ stopover station. So the effect is very small. During the construction period, mountain soil or filling can scare all kinds of small animals to disturb their life in the vegetation. Some of them may move to other places. And some may move back when the vegetation along the road restores to become the new members of the ecosystem so the effect on them is small, too. Therefore,

although the construction of the highway for wildlife habitat have certain effect, but the effect degree is relatively limited.

4、Effect on soil erosion

The soil erosion mainly happens in road excavation and the earth-fetching area and earth-wasting area for soil and rock. About the highway construction, Conditions in the process of excavation and other activities will change the original topography and land use. That can cause the destruction of vegetation and soil surface. When rain fall along the side of the road, the erosion and runoff can lead to soil erosion. The abandon soil and stone during the project period will also lead to man-made soil erosion. Interference of potential landslide sections may cause landslides and collapse which can lead to serious road erosion events to jam and endanger the people using the roads. Some sub-project of the highway construction belongs to karst landform in which the surface soil layer is so thin that may produce high risk of soil erosion.

This construction period will avoid rainy day and the excavation conditions will all be backfill without setting the earth-wasting yard. Taking some protection measures for potential landslide and collapse sections will reduce the effect on the enviroment caused by the soil erosion.

（III）The analysis of the influence of surface water during the construction period

During the construction period, the influence of surface water is mainly embodied in the construction waste water and sewage produced by the construction personnel to the influence of surface water environment.

1、The construction waste water

The waste water of the production mainly produce in the process of the concrete mixing in the construction site, such as the wastewater from washing the sand and gravel aggregate, the oily water from construction machinery maintenance and flushing, the wastewater from prefabricated maintenance and ground flush. The main pollutant is SS and the concentration can reach 3000 ~ 5000 mg/L. The surface water bodies and the water environment will be polluted if we do not handle the wastewater. This project intends to build drainage and temporary settling pond to collect production wastewater and later put it in the settling pond to use again instead of drainaging outside. Clean the sedimentation of suspended matter regularly and fill it disposal properly to improve the effect on the water environment.

2、The sewerage

According to 50 construction personnel （80L/d. one person）, the production of every sewage is about 4m3/d. The pollutant is mainly COD, SS, NH3-N, petroleum and T – P with the concentration is about 250 mg/l, 220 mg/l, 30 mg/l, 5 mg/l, 3 mg/l respectively. If it is mishandled, sewage discharges into nearby water easily to cause water pollution. Because this project belongs to rural road improvement project, construction personnel mainly come from the nearby villages. A small number of technicians and management personnel rent villagers' houses. The sewage does not drainage outside instead of using as agricultural fertilizer and agricultural irrigation collected by villagers. There is no effect on the water environment by natural purification of soil and crop absorption.

（IV）The analysis of the influence of groundwater environment during the construction period

The road engineering project belongs to non pollution ecological projects and the project content has no tunnel construction and tunnel engineering.

Road project is located in mountain and hilly region and the is deeper. So the project construction has little effect on the groundwater. Only at high filling and deep regional, the groundwater may flow when the road foundation is excavated. Besides the local ground water levels may fall to affect the distribution of regional groundwater. During the project, a variety of waste oil, waste water and sludge treatment and other irregularities may be the main reason for affecting groundwater quality. The project intends to build cross drains, temporary sedimentation tanks to collect and process the sewage without drainaging outside and the effect on groundwater is minimal. According to the scene, the drinking water of the residents comes from the valley and ponds where are away from the construction site, so the construction will not affect the drinking water of the residents.

（V）The analysis of the influence of atmosphere environment during the construction period

The effect of the project is mainly on the atmosphere environment such as the transportation, stacking and mixing of engineering materials, spoil and abandoned stone, dust generated by shed mud and vehicle exhaust, gas blast. A closed transport, wet spray, and timely cleaning dirt of the wheels and other measures can be taken to mitigate the effect on the atmospheric environment. Since the construction site is in the vast mountain, atmospheric pollutant can spread easily because of the length and width. There are also few people near here, so the effect on the environment and residents is very small. And during the period of construction, the atmospheric influence is temporary and it will disappear as the project construction complete.

（VI）The analysis of the influence of acoustic environment during the construction period

The construction machinery and blasting noise will have an effect on the surrounding environment. During the period of construction. For the acoustic environmental sensitive area such as villages and schools at both sides of highway, this project will strictly carry out the relevant provisions according to the construction field noise limit (GB12523-1990). The construction is strictly prohibited in the sound environment sensitive areas during the night and the exam period. Other road construction projects will avoid using strong noise equipment at night and arrange work time reasonably. So the influence of noise on the surrounding environment will not be very big.

（VII）The analysis of the influence of environment caused by solid waste during the construction period

The solid waste is mainly manifested in waste soil, construction waste and living garbage of construction personnel produced during the process of the excavation. The solid waste belongs to the general normal waste. If the solid waste cannot be handled well, a lot of soil will enter the water to silt the drainage channels, bury the farmland and destroy the ecological environment. The mess of construction waste and living garbage will affect the landscape and breed flies and mice. It will be bad for the health of nearby residents. Since the entire earth excavation will be backfill, construction should avoid the rainy season and should be in accordance with the requirements of soil and water conservation. The woven bag should be put around the temporary abandon soil and stone to reduce exposed topsoil and the rain washing. The construction waste should be recycled or backfill which is too little to recycle to reduce the effect on the enviroment. According to 50 construction personnel （0.5kg/d. one person）, the production of every living garbage is about 0.75t/a.It is so little that it can be collected to the life garbage dump in nearby villages and

towns to handle together. Then the effect on the local environment will be less.

II. The analysis of the influence of water conservancy and electricity construction project during the construction period

The water conservancy project is mainly the reservoir and water diversion trench. This rural development project plans to invest 11,000,000 yuan to build 846 reservoirs in Guizhou. The implement scale and implement site of this project detail in chapter 2 of this report, table 2.3 1.

（I）Technological process and the analysis of the production pollution

The construction of water conservancy projects mainly serves in irrigation water of the all kinds of industries. The main environmental effect is during construction period. During the construction period the project of reservoir, water diversion trench, the sand basin, foundation excavation and land leveling engineering are main. During the construction the abandoned slag and soil, noise, soil erosion and ecological broken will cause an inherent pollution to the local environment. The main influence of operating period is noise. Here is the technological process diagram.

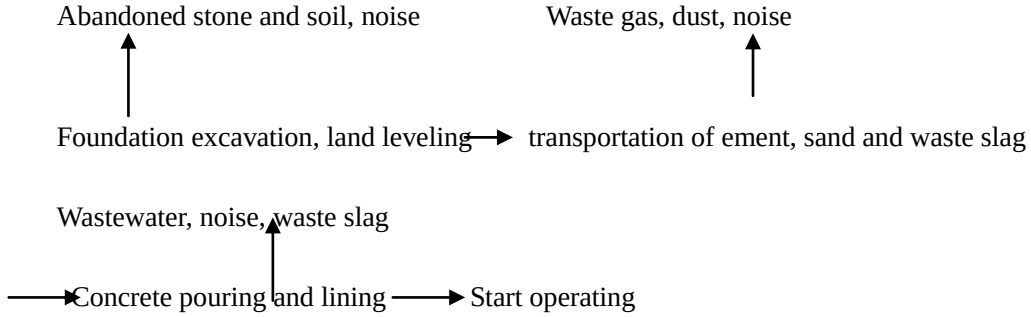


Figure 4.2 1 Reservoir and its supporting engineering technological process diagram

（二）The analysis of the influence of the ecological environment during the construction period

The ecological effect of this project is mainly the covering area of this construction project, the stack of the waste soil and stone from the foundation excavation and land leveling and the effect on the crops, vegetation and soil erosion.

1、The effect on covering area

The proposed construction will take the land permanently and change the original land use properties. Cultivated land utilization will break farmland vegetation, and reduces the production of crops to reduce farmers' incomes. Forest land utilization will bring damage to trees within the scope of land expropriation. This change is permanent and can't restore vegetation. So a certain amount of biomass will lose. So the location of the project tries to choose the barren hills and barren land instead of occupying garden and forest. According to the relevant country land laws, the planning project must make land compensation and try to minimize the effect. Because the reservoirs are built on the top of the water shortage hill and top and the occupied land are barren hills, dry land, open woodland and so on, the effect on the environment is smaller.

2、The effect on soil erosion

Generally, and the effect on soil erosion of construction projects is mainly manifested in the following two aspects: Surface excavation damages the vegetation and causes the ground bare so the rainfall can enhance soil erosion. All kinds of temporary covers an area of destruction of original vegetation and aggravates the local soil erosion. In case of discarded soil temporary pool management at the time, not prone to sheet erosion, shallow

gully erosion and other forms of soil and water loss. If the temporary dumps of waste soil was not managed well, it may cause the sheet erosion, shallow gully erosion and other forms of soil erosion.

The discard soil and stone should be made full use depending on the type during excavation project of water conservancy project. The earth can be used to fill and afforest. The stone is used for reservoir or ditches. During excavation conditions, the soil erosion caused by the rainfall has an effect on receiving channel.

3、The effect on the landscape environment

During the period of construction, because of the conditions excavation, the original landscape is disturbed and the green land is damaged in varying degrees. In addition, raw and auxiliary materials and construction facilities are piled up disorderly and temporary facilities are set up in mess. All these activities are bad for the landscape. The covering area of the reservoir, water diversion channel and sand basin is small, but the number of the reservoir is big. That is the landscape basal nodes in the region. The construction of the reservoir and the affiliated facilities is mainly to make the overall landscape design to reservoir and ancillary facilities. The purpose is to coordinate reservoir and the surrounding buildings and green belts with considering the environmental protection, greening and landscape. In order to do a good job of forming scale agricultural industrial park to drive the tourism development, the project also increase the rural environment aesthetic property.

（III）The analysis of the effect on the atmospheric environment during the construction period

The effect of the project is mainly on the atmosphere environment such as transportation, stacking and mixing of engineering materials, spoil and abandoned stone, dust generated by shed mud. A closed transport, wet spray, and timely cleaning dirt of the wheels and other measures can be taken。 So the effect on the environment can be reduced to the minimum extent.

（IV）The analysis of the effect on the acoustic environment caused by construction noise

The construction machinery and blasting noise will have an effect on the surrounding environment during the period of construction. For the acoustic environmental sensitive area such as villages and schools near the project, this project will strictly carry out the relevant provisions according to the construction field noise limit (GB12523-1990). The construction is strictly prohibited in the sound environment sensitive areas during the night and the exam period. Other road construction projects will avoid using strong noise equipment at night and arrange work time reasonably. So the influence of noise on the surrounding environment will not be very big.

（V）The analysis of the influence of surface water during the construction period

During the construction period, the wastewater is mainly embodied in the construction waste water and sewage produced by the construction personnel.

1、The construction waste

The main pollutant is SS and the concentration is 1200mg/L. After the ground settling pit precipitation treatment, sewage from the foundation excavation and construction will be put it in the settling pond to use again instead of drainaging outside. So the effect on the water environment is small.

2、The sewerage

According to 30 construction personnel （80L/d. one person）, the production of

every sewage is about 2.4 m3/d. The pollutant is mainly COD, SS, NH3-N, petroleum and T – P with the concentration is about 250 mg/l, 220 mg/l, 30 mg/l, 5 mg/l, 3 mg/l respectively. If it is mishandled, sewage discharges into nearby water easily to cause water pollution. Because this project belongs to rural road improvement project, construction personnel mainly come from the nearby villages. A small number of technicians and management personnel rent villagers' houses. The sewage does not drainage outside instead of using as agricultural fertilizer and agricultural irrigation collected by villagers. There is no effect on the water environment by natural purification of soil and crop absorption.

（VI）The analysis of the influence of groundwater environment during the construction period

During the construction in the foundation excavation, the project may be part involves the groundwater. But the construction period is shorter and wastewater composition is simple, so the groundwater may be not polluted.

（VII）The analysis of the influence of environment caused by solid waste during the construction period

The solid waste is mainly manifested in waste soil, construction waste and living garbage of construction personnel produced during the process of the excavation. The entire earth excavation will be backfill and it can be collected to the life garbage dump near the villages and towns to handle together. Then the effect on the local environment will be less.

4.1.2 The analysis of the influence of nonlinear engineering construction period

The objective nonlinear engineering mainly include product vault and agricultural products trading market infrastructure, production facilities, office buildings construction and industry promotion, etc. The product vault is used for storage of agricultural products. Trading market is used for agricultural products and livestock trades freely. The market is usually in the combining site or the countryside residents concentration. It is convenient to form the sustainable developmental market with stream of people. The project process and sewage link are shown in figure 4.1.2-1.

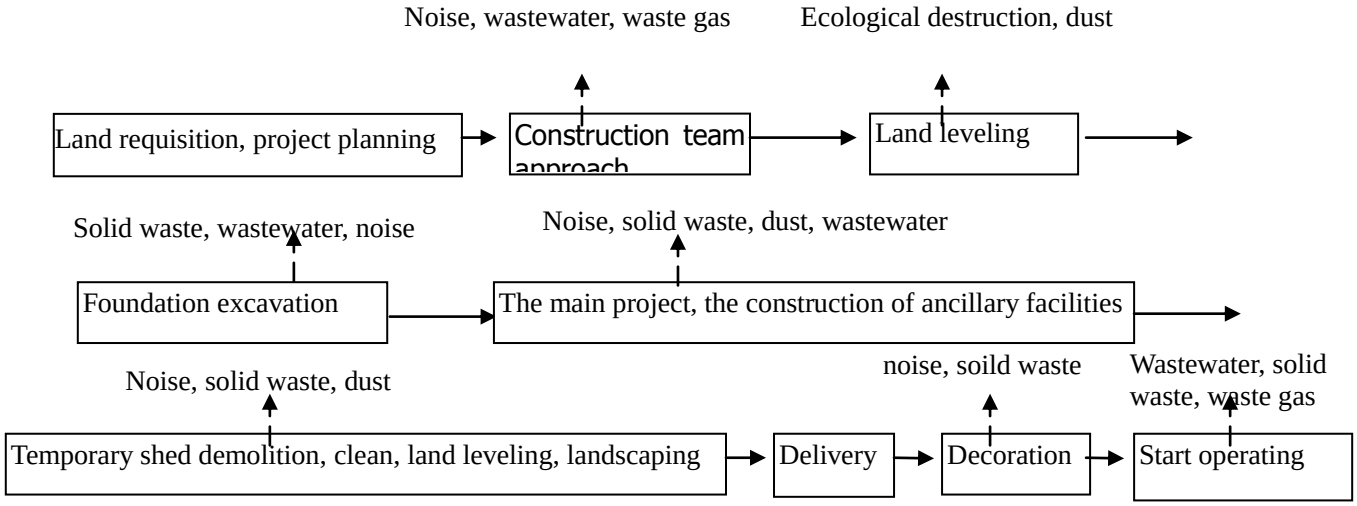


Figure 4.1.2-1. The proposed project process

1、The effect on the atmosphere environment

The impact of the project is mainly on the atmosphere environment such as transportation, stacking and mixing of engineering materials (cement and gravel), spoil and abandoned stone, dust generated by shed mud. A closed transport, wet spray, and timely cleaning dirt of the wheels and other measures can be taken. So the impact on the environment can be reduced to the minimum extent.

Engineering automobile exhaust emissions will affect the surrounding atmosphere during the construction.

Construction teams use clean energy such as the liquefied petroleum gas or electric energy for their life so the effect on the surrounding atmosphere is less.

2、The effect on the acoustic environment

Mixers, bulldozers, trucks and other construction machinery sound intensity is 90-100dB (A). Construction process has a certain effect on the surrounding environment. Therefore, the construction equipment must comply with the national noise standards and strengthen the management and reasonable arrangements for the high -noise equipment construction period. Besides, the construction must comply with the construction time of the administration department and reduce the noise effect.

3、The effect on the water environment

Construction wastewater is mainly from washing sand, concrete curing and pit wastewater. The wastewater has high suspended solids. According to survey data analogy about the construction, the wastewater in this district is 10m3/d and SS is up to 1000-2000mg / L.

Sewage

The main sewage is mainly from construction workers. Construction workers calculate according to 50 people a day. Water standards is 80L / person a day. Displacement is calculated at 80% of water consumption. The generation of the sewage is 3.2m3/d. According to the analogy survey, the sewage water quality is COD (300mg / L), BOD5 (180mg / L), SS (220mg / L) and NH3-N (35mg / L).

Direct discharge of construction wastewater and sewage has a certain effect on the surrounding water bodies.

5、The solid waste

There are some solid wastes such as construction waste and a small amount of living garbage during the project period. If they are randomly stacked, the pollution washed by rain will cause localized erosion and pollute the water body. In order to prevent the adverse effects of the construction solid waste on the environment, the construction should try to dig for filling shift and reduce the amount of abandoned soil and stone. The abandoned soil and stone will be carried to the designated stacked buildings.

The living garbage from construction workers is about 25 kg one day. Every person makes about 0.5 kg living garbage one day. The garbage can be collected to the life garbage dump in nearby villages and towns to handle together.

6、The effect on the ecological environment

The project causes following bad effects such as occupation of land, changing land function, the excavation of the soil and stone, heap of the abandon slag and building materials and so on. All of these effects can be caused the destruction of vegetation and soil erosion to damage and affect the landscape.

4.2 Environmental impact analysis of the operation period

4.2.1 The environmental impact analysis and evaluation of the linear engineering

operation period

I. The environmental impact analysis and evaluation of the rural highway operation period

（I）The analysis of ecological environment impact during the operation period

After the completion of road the passing vehicles quantity will increase dramatically and the exhaust emissions will increase significantly. Emissions from motor vehicles are mainly tiny particles. The harm to crops is generally the pollutants whose diameter is less than 10 um go through crop leaf stoma to arrive in catheter after being absorbed by the plant cell gap, and then run to the other parts. Therefore, the harm degree of the crop is closely related with its stoma activity rules and most of the crops resistance of pollutants at night is stronger than during the day. Crop growth process includes four periods, emergence, jointing stage, flowering and earing. The flowering period is the most sensitive and can be affected most easily.

The motor vehicle exhaust pollutant is mainly NOX, HC and so on. The main crop is rice, vegetables and potatoes in the nearby villages. According to the "assessment technical principle and method of environmental impact, we can know the effect of Nitrogen dioxide chronic exposure on crop growth and yield. When the concentration of nitrogen dioxide in the air reaches 2mg/m3, that will almost have no effect on the output of rice. When the concentration of nitrogen dioxide in the air reaches over 2mg/m3, that will have an effect on the output of wheat. The road engineering is rural highway now so there is less traffic. The average concentration of NOX is less than 2mg/m3 at the place of 40 meters away from the road centerline. It is below secondary standard requirements of the "Ambient Air Quality Standard" (GB3095-1996).

Therefore, the motor vehicle exhaust emissions have a little effect on the growth of the crops such as rice and vegetables along the road.

The terminative construction of country roads including industrial road, machine-ploughed road and field road provides the convenience for local villagers and the transportation of agricultural materials and products. It also creates conditions for rural production mechanization and provide advantages for the introduction of advanced agricultural technology. The agricultural planting structure can be further optimized. This project also increase crop yield and farmers' income and realize the value of land resources' transformation in the form which stimulates the development of rural industry and promote the rural industry development of the economy in this region.

（II）The analysis of the influence of surface water during the operation period

The water environment pollution to the road during the operation period is only the runoff sewage formed at the early time of the rainstorm.

As traffic increases year by year, the settlement of the motor vehicle exhaust emission, leakage of oil and other harmful substances scattered on the road will also increase year by year after the operation of the proposed road. Once the pollutants with the precipitation runoff go into the water, it will have a certain effect on the water quality.

After the operation of the road the rains washes out the road surface, the main pollutants of the runoff sewage are suspended solids (SS), oil, organic matter, etc. This project is located in the countryside, transport vehicles is relatively small during the operation period and so the road SS, oil content is less. From the rain beginning to form surface runoff, the concentration of suspended solids and oil material is higher in the stormwater runoff and the concentration with the extension of rainfall falls down quickly.

Rainfall lasts for 20 minutes or so, the road can be rinsed clean basically and the pollutant content is low. Ater the rain washing, the influence on the surrounding surface water and soil environment is less.

（III）The analysis of the influence of atmosphere during the operation period

1、The analysis of atmospheric pollution source

During the road operating period, the air pollution mainly comes from vehicle exhaust, the dust and road dust because of the uncovered cargo from various trucks carrying carrier particles.

2、The analysis of the influence of atmospheric pollution

After the implementation of the road project, dust pollution will be reduced. But during the project operation, dust and the car tail gas from vehicle emissions will cause air pollution. The main pollutants are CO, NOX, THC, and TSP. Pollutants emissions increase proportionably according to the size and traffic volume and it is relative to the operation condition of the vehicle types and car running. Along with the increase of traffic volume, the effect on pollutants NO2 of vehicle emissions also increase. According to forecast of similar way, daily average concentration forecast of the NO2 and TSP 5 m away from the road shoulder can satisfy the environmental air quality the secondary standards under the condition of the largest traffic volume in this forward project. After road implementing the distance from the recent sensitive to road shoulder is generally more than 10 m. Therefore, car exhaust emissions have less effect on the environment in the area along the road during the road operating period.

（IV）The analysis of the influence of acoustic environment during the operation period

1、Impact characteristics of sound environment

Noise pollution is mainly from the traffic noise of auto operation. The noise includes the engine noise in the process of operation, turbulent airflow caused by car and the noise from exhaust system and the friction between the tire and road surface. Because of the road surface roughness, the high speed vehicle vibration can cause noise. According to the result of the highway traffic noise emission source test, the average radiation levels of various vehicles at different speeds is shown in table 4.1 1.

Table 4.1-1 The average radiation levels of various vehicles

Road	Types of vehicles	Calculation formula	The average speed of various vehicles(km/h)	the average radiation levels Lw，I（dB）
Proposed highway	Small cars	12.6+34.73lgVS	15	53.5
	Medium cars	8.8+40.48lgVM	15	56.4
	Large cars	22.0+36.32lgVL	15	64.7

2、The impact prediction of noise

Road projects are located in rural areas, the large noise source is not found near industrial enterprises. This project can satisfy the secondly class standards for acoustic environmental quality (GB3096-2008) and the requirements of sound environment quality is better. Because the project is located in rural areas, the traffic is less. The design speed is low, so there is almost no vehicles at night. The sound environment sensitive places are less and building walls of rural area and scarp of shielding can reduce the noise. Therefore, the traffic noise has little effect on the surrounding sensitive places during the operating period.

（V）The analysis of environmental risk

The road engineering project is the main channel to link related villages. It is mainly to

undertake the function of the rural traffic. Environmental risks during project operating is mainly the sudden escape and leakage for chemical fertilizers, pesticides and other harmful substances in the process of transportation. When these escape and leakage accidents once appear, it may cause a certain area of malignant pollution and cause certain harm to the local environment.

1、The identification of environmental risk

Based on the analysis of environment sensitivity of the engineering properties, quantities and project area, there are still some potential risks during the engineering construction and operation expect the adverse environmental impact in normal situation. After the dentification and evaluation of every possible form of ecological damage, environmental accidents and consequences, the project's main environmental risk is determined to exist in the following two aspects.

（1）The collapse of subgrade slope

Roadway excavation and embankment filling load break the vulnerable balance conditions of the original slope stability, deposit from construction and operation easily slip along the structural plane under the invasion of the rain. The mountain road with similar characteristics is still likely to cause the upper debris to slide along the structural plane and disable the retaining wall reinforcement measures to interrupt the traffic under the action of heavy rain, although the project adopt more perfect engineering protections and reinforcement measures.

（2）The impact on the water and soil of vehicle reverse during the operation

Generally, during operating period of the project road, harmful substances of vehicle transport mainly include pesticides and fertilizers. The main risks are sudden leakage, explosion and burning of the transporting dangerous goods in transit because of breaking the relevant provisions of a traffic accident and the dangerous goods transportation. If the danger happens, it will cause a range of malignant pollution accident and greater harm to the local environment in a very short time. Then the state property will also be lost.

The environmental pollution caused by traffic accident is mainly car accident when cars are across the road or along waters. The accident may produce pollution to water. The pollution of soil and water types mainly includes:

①The leak of gasoline or diesel and engine oil carried by vehicles may discharge into the nearby water bodies or the surface soil.

②The leak of chemical dangerous goods after a traffic accident caused by the transport vehicles with chemical dangerous goods. The leak may discharge into the nearby water bodies or the surface soil.

③A traffic accident happen on the bridge and the car with all the goods fall into the river.

2、The assessment level of environmental risk

According to the environmental risk assessment technical guideline of the construction projects and the provisions of the environmental risk assessment work hierarchies, the project itself has no material and functional risk hazard and the happening of the risk is probability caused by indirect behavior. The project environmental risk evaluation level is level ii.

3、The analysis of environmental risk

The proposed highway project is rural road. The design speed of the road is low and the daily traffic volume is small. The probability of the traffic accidents for dangerous goods

transport is not big. The probability of the leakage, explosion and fire accidents caused by large traffic accidents may be even smaller in the proposed highway. The probability of water pollution caused by the car out of the road hardly happen.

II. The analysis of the influence of water conservancy and electricity construction project during the operation period

The water conservancy engineering is mainly 846 reservoirs and some flumes. Shi Qian County builds 2100mm power supply system. Project operation has no effect on the environment but mainly positive effect. The construction of the irrigation canals and the power supply facilities such as the construction of reservoirs and flumes will solve the problem of crop irrigation. In dry season, the construction can increase the irrigation area and promote the development of the grain and cash crops. It can also promote agricultural production and increase farmers' income. But it is important to strengthen the safety management to avoid adults, children and animals drowning into a pool or electrocution accidents.

4.2.2 The analysis of the influence of nonlinear engineering operation period

I. The technological process and the analysis of the production

During the operation period, the environmental impact is mainly reflected in following: The noise emitted by market transactions, garbage (leaves, waste packing materials, etc.), waste water and waste solid waste. The stench, excrement and urine caused by pollutants in livestock trading market and the effect on the surrounding environment of the noise and dust caused by the transport vehicles. The technological process is detailed in figure 4.2.2-1.

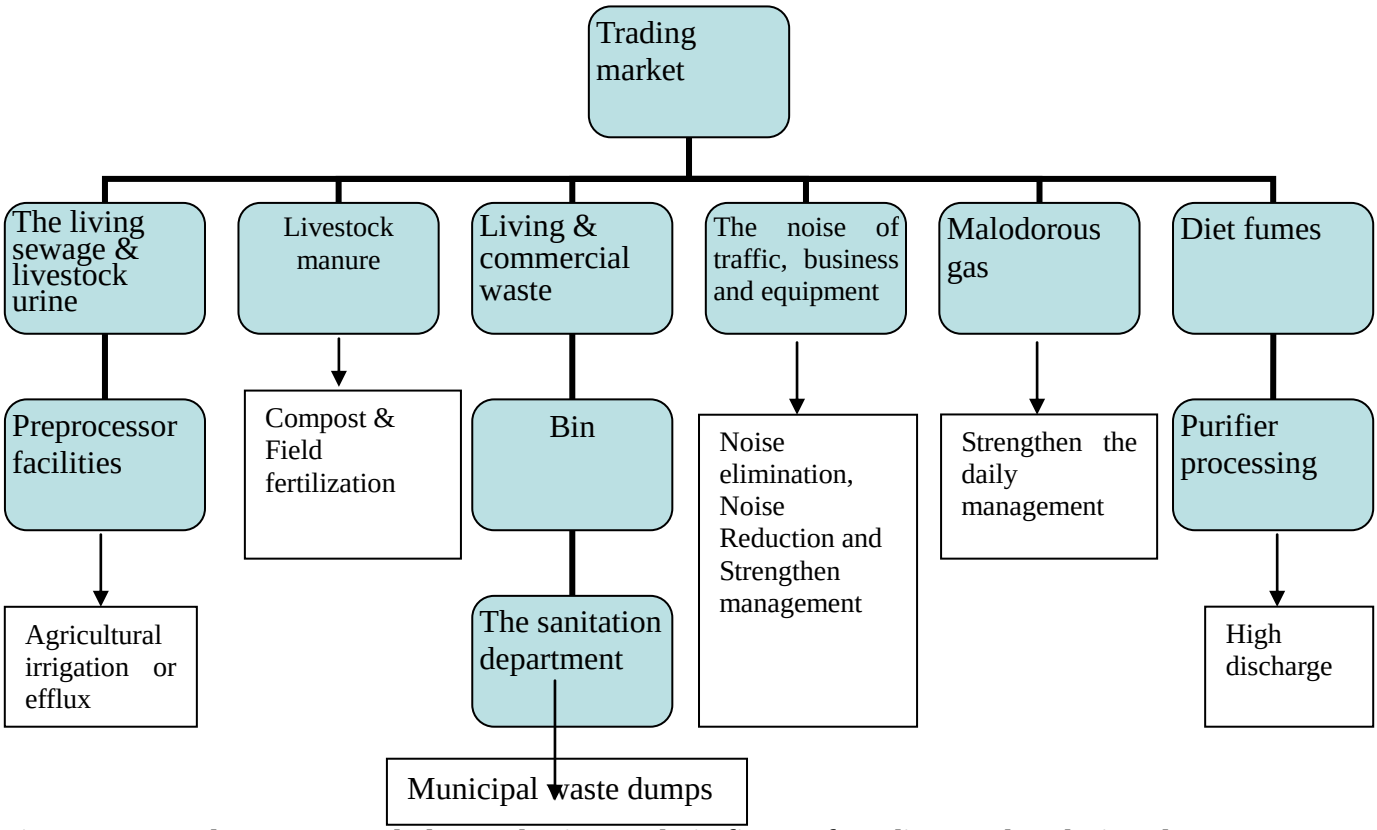


Figure 4.2.2-1 The process and the production analysis figure of trading market during the operation period

II. The analysis of the influence of atmosphere environment during the operation

period

After the completion of trading market, the exhaust gas is mainly from the car in the garage, the malodorous gas from livestock captive room and garbage collection point, the lampblack from dining place.

Dining fume emission and governance

(1) The diet lampblack in trading venues is mainly from catering area of business district. The Environmental Impact Assessment, EIA for short, requires the concentrated flue shall be reserved at dining area in the buildings. All the lampblack can be discharged through the roof after cooling and degreasing management by the efficien exhaust gas purification device in the dining area. After fume purification treatment, the concentrations of projects fume emission can reach 1.6mg/m3. It is below the 2mg/m3 emission standard according to "cooking fume emission standards " (GB18483-2001) and it can achieve discharge standards. The dining area within the project to perform the relevant requirements in "the catering industry environmental protection technical specifications" (HJ554-2010) released by the environmental protection department. All food business units should be installed lampblack purification facilities. And the lampblack should be discharged by the reserved flue on the roof of their building. And the distance from the dining area and the lampblack discharge outlet to the surrounding sensitive buildings should satisfy the relevant provisions in "Environmental Protection Technical Specifications of Catering Industry" (HJ554-2010). In the present construction process, flue discharge channel should be reserved in relating to the catering building, the lampblack discharge channel should be set in partition but relatively concentrated, and they should be set under the special shaft.

(2) The analysis of the influence of the malodorous environment: In the garbage operation process, the part of the corruptible organic garbage can emit an odor due to its decomposition so the impact on the environmental is malodorous gas. According to the national standard, the malodorous pollutant refers to all the gas material that can stimulate olfactory organs, make people unhappy and damage living environment. The livestock manure from poultry and livestock exchange market place and housing room will produce malodorous gas (mainly NH3 and H2S). The discharge type is low diffuse form and a fugitive emissions. And the poultry and livestock exchange market place and housing room discharge temporarily, so the malodorous gas is intermittent.

（3）Automobile exhaust: Automobile exhaust discharge is mall. The vehicle exhaust quantity can be reduced by strengthening the traffic management and reducing the idle speed. The traffic volume is relatively small in the project area, and environmental quality status is better. The automobile exhaust does not cause local air pollution after dilution diffusion.

（4）The exhaust from the farmer's market

The exhaust from the farmer's market is mainly fish smell and rotten smell of the fruits and vegetables in the area of aquaculture. The market strengthen the natural ventilation mode and indoor ventilation, clean up solid garbage in time and strengthen the shop management measures to effectively reduce the influence on surrounding environment caused by peculiar smell infarmers' market.

III. The analysis of the influence of water environment during the operation period

When the commercial market is completed, the sewage is mainly from the business water, the domestic water from farmers' market and livestock urine, etc.

According to the present status, market position is not clear and there is no supporting and

auxiliary facilities around the market. So the EIA recommend that according to the construction scale of market, the regions can configure the wastewater treatment facilities reasonably. Trading market is on a smaller scale and the waste water emissions less. If there are more farmland and forest land in the surrounding, they could be used for irrigation fertilization by septic tanks. The waste water used in irrigation should satisfy requirements of the irrigation water quality standard (GB5084-2005). The scale of trading market is larger and sewage emissions more. If the place surrounding the project has no irrigation condition, the relevant departments should configure corresponding sewage treatment station to discharge the life and production wastewater when they reach the discharging standard after treatment.

The catering wastewater contains oil, so the oil separation treatment should be performed before processing. The dry livestock and poultry manure should be departed from the wet, then to deal with livestock wastewater.

IV. The analysis of the influence of noise environment during the operation period

After project put into use, the noise mainly comes from the vehicle traffic noise, commercial noise, livestock business calls and equipment noise.

（1）The analysis of the influence of life noise environment

The noise source is from the office life and entertainment. The noise source is small and belongs to the intermittent sound source. It can be effectively controlled through strengthening property management and the impact is not big.

（2）The analysis of the influence of commercial noise environment

The market includes farmers' market and business district. Some commercial noise happens in the process of operation. The was to cut noise are the reasonable layout of shops location, to keep enough distance from the shop to the residents in the design, to take measures to strengthen the internal sound insulation and the use of green belts. At the same time, making the strict management system to prevent commercial noise.

（3）The analysis of the influence of the passing vehicle noise environment

The measures that to take no horn on the ground parking lot to the passing vehicle, to minimize the frequent start and idle speed of the motor vehicle and the specification of the parking order can reduce the vehicle noise and have a small influence on residents.

（4）The analysis of the influence of the equipment operation noise environment

After the completion of the project, the main equipment noise source is water pump, fan, outdoor air conditioner and so on. The air conditioner is on the roof outside the building and the rest are installed in the basement. The noise source is between 65 and 90 db (A). Through the measures of building sound insulation, vibration damping and noise elimination, it almost has no impact on the surrounding environment.

（5）Cattle calls: Cattle calls is intermittent noise. The noise source is between70 and 80 db (A).

V. The analysis of the influence of solid waste

After the completion of the trading market, the solid wastes are from the life garbage of commercial employees and customers, hutch garbage and the livestock and poultry dung.

（1）Life garbage

Living garbage is collected in collection bags by each point then it is shipped to garbage collection pool. After concentrated collection, the life garbage is transported to landfill near the villages and towns. Garbage collection pool is set closed. There is someone who's in charge of cleaning and spraying disinfection liquid medicine. The garbage is

shipped to the municipal garbage collection point in time, reducing the generation and dissipation garbage stench. In addition, the office waste may contain selenium drum and waste batteries. They should not be mixed with the living garbage instead of a separate collection in order to avoid causing the pollution of heavy metals on soil and groundwater.

For food and hutch garbage and waste oils, evaluation requirements must be executed with reference to the catering industry environmental protection technical specification requirements, deliver the eat hutch garbage and waste oil to the qualified units to collect and treat.

（2）Livestock and poultry dung

Livestock and poultry dung easily stinks and breed flies. It can also pollute the atmospheric environment. If it is not handled in time, it is easy to get into paste and loss.

The livestock and poultry dung should be properly handled in time. If the dung cannot be shipped in time, we should set up special temporary place and set the canopy and adopt seepage control measures. We also should be conducted on a regular basis to the stacking place in the summer with spraying the disinfectant. We should reasonable decorate temporary stacking places for livestock and poultry dung, making them away from environment sensitive place such as the surface of the water body and residential area.

4.2.3 The analysis of the influence of fresh system during the operation period

Fresh system involves hollow lee industries and Yinjiang counties edible fungi processing and preservation along the river. The specific construction content and scale is detailed in this report table 2.3 1.

(1) Analysis of air pollution:

Frozen workshop: Project ammonia leakage is mainly in the refrigeration system. Refrigerants in refrigeration system is liquid ammonia. The refrigeration cycle uses ammonia single stage compression and the form of direct expansion evaporation. The condensation temperatureis 40 ℃ and the evaporating temperature is 70 ℃. The process flow: Low pressure ammonia is compressed by compressor into high pressure steam, then through oil, and condense in a condenser to high pressure liquid ammonia to enter the storage of ammonia. The high pressure liquid ammonia from the ammonia storage device is for throttling expansion evaporation to the refrigerant cooler. After that, the high pressure liquid ammonia is pulled back to the air compressor by the suction and so the cycle. When the oil or the air is put out of ammonia equipment, there will be a little ammonia leakage. According to the provisions of the State Environmental Protection Department, the highest concentration of ammonia production plant is 30 mg/m3, adopting the multi-bubble bottle sampling and often have a test to the workshop colorimetric detection of ammonia concentration. The way to reduce the concentration of ammonia is forced ventilation when ammonia concentration exceeds the room, for example, setting the open button of the fan inside and outside the room, preparing a gas mask in the refrigeration plant, having security doors for high and low voltage equipment and setting the number of daily forced ventilation equal to or greater than eight times per hour. Ammonia must be strengthened its risk prevention. The risk prevention established can prevent the risk of accidents and protect normal production and life.

② Noise pollution analysis: Equipment noise: The main noise sources are refrigeration units, corridor ventilation equipment, pumps, power distribution room and so on. According to the analogy, sound level surveys of these noise sources are shown in Table 4.2.3-1.

Table 4.2.3-1. The main noise source strength

No.	Name of the noise source	Sound level dB (A)
1	The refrigeration units	85～95
2	The pumps	80～95
3	The power distribution room	55～70

Cooling tower noise: Cooling tower noise source consists of the following four main parts, fan intake and exhaust noise, watering noise, fan noise reducer and motor pumps and cooling towers, piping and valve noise.

Fan noise is air flow noise caused by blade driving the air turbulence. It is the main noise source of cooling tower. At the same time, circulating water of the cooling tower flows from the upper spray pipe. It is one of the noise source caused by the packing free fall to sink. In addition, the tower body of the cooling tower noise will also have a certain influence on the cooling tower.

③ Analysis of water pollution: Mainly the ground flush water and cooling water circulation.

④ Analysis of solid waste pollution: The regular living garbage bags produced is cleaned by local sanitation department after processing. They clean the garbage every day without discharging at random. There is basically no effect on the local environment. Production of solid waste is mainly unqualified agricultural product and junk picked out of the logistics process.

5. ANALYSIS OF IMPACT OF AGRICULTURAL ACTIVITIES

5.1 Impact analysis of planting activities

The projected plantation mainly concludes expansion of agricultural cultivation and replant varieties, including root vegetables (potatoes, konjac), economic fruit trees (walnut, tea, hollow plums, grapes), herbs (Tianma, arrowroot, bellflower, Scrophulariaceae, Codonopsis, honeysuckle, yew, Salvia, Radix, Baiji, tec.), mushroom and vegetables.

5.1.1 The whole process of planting and impact analysis

The main environmental problems of plantation are fertilizer pollution, pesticide pollution, and plastic film pollution after the using of agricultural production, as well as some ecological impacts, such as the environmental impact of surface water by agricultural irrigation.

1. Root vegetable

With virus-free potato, for example, of the largest acreage, and its similarity of the planting process and environmental impact with arrowroot, Ginseng, and konjac. The planting process as follow:

① Site selection: poor villagers' contracted land; flat, gentle slope within 5°～10°; deep soil, up to 50 cm or more; loose soil, preferably a loam or light sandy loam with strong performance of fertilizer and water retention; water and convenient irrigation; land with medium fertility or more; steep slopes, gravel land, nest in the sand, barren land and waterlogged lowland.

②Soil Preparation: It is required the plot be plowed to the depth of 0.3 m to 0.5 m in the winter and plowed again shallowly in next spring, the blocks and other suchlike sundries mixed with the soil should be cleared away and the clods should be smashed to level the surface of the plot.

③Seed Selection: Select detoxicated breeder's stock high yield disease-resistant middle lately ripening fine breed—jicama 97, jicama14 and mila, etc. .

④Seeding Specification: Invariably adopt the specification of wide and narrow row spacing to dig pits and to plant on the ridge(the ridge with the width of 2 chi and the trough

with the width of 1 chi together are called "Xiang") with the Xiang of 3 chi(2 chi for two ridges + 1 chi trough) and the plant spacing of 0.9- 1 chi, 4000- 4400 plants / mu.

⑤Application of the Base Fertilizer: According to the regulation of much base fertilizer and little additional fertilizer, apply 1000 kg farmyard manure, 50 kg compound fertilizer exclusively use for potatoes and 5 kg urea per mu, mix up three kinds of fertilizer and piled it up and cover it hermetically with thin film, apply intensive hole fertilization and cover it with a thin layer of soil, seed the whole potato(take care to isolate the seed potato from the fertilizer), after that cover the seed with soil to form ridge, after completing seeding, form the so called double low ridges or double flat ridges.

⑥Field Management: After all the seeds germinate, apply fertilizer to the sprout(10 kg in total) and shallowly plow weeding for the first time;

⑦Harvest: When in middle late July, the plant stop growing and the parts above the ground turn yellow and withered, begin to harvest. In the course of harvest, prevent breaking the potatoes, after digging all them out, spread them out to dry for an appropriate while and then transport them to the air shed to dry in the shade and finally bag them respectively in size grading way. Storage Methods: mainly adopt two ways: one is indoor storage covered for keeping the temperature; the other is storae covered in cellar.

The technological process of potato culture is as follows:

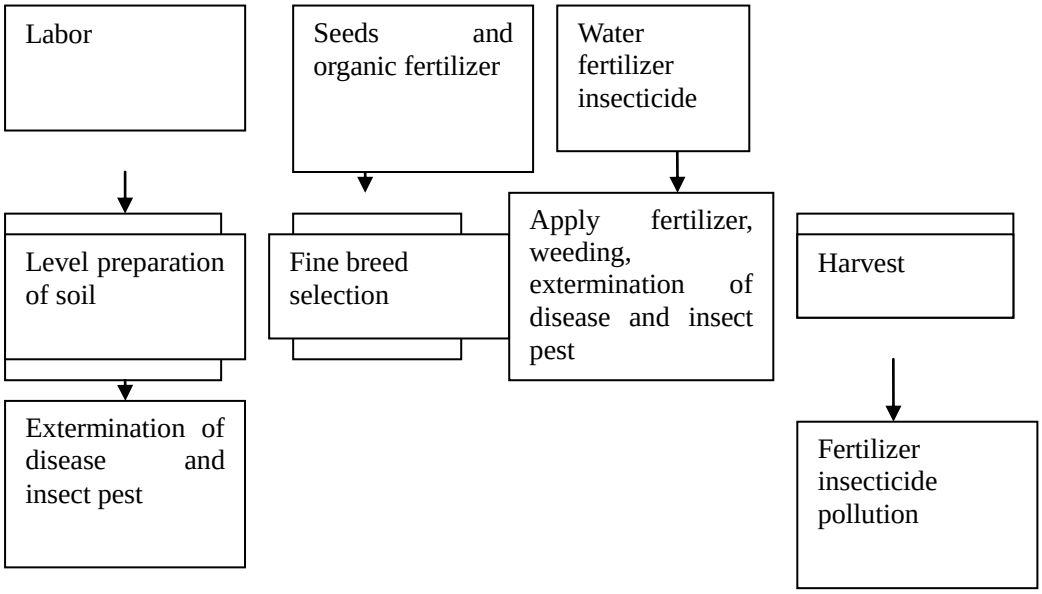


Figure 5.1.1-1 The whole process of potato culture

2. Economic Fruit-bearing Forest (taking walnut for an example) Fine Breed Breeding

（1）Arranging the Nursery

①Soil Selection: Select the seed plot in the field that is undertaken by a indigent farmer; and walnut trees are photophilous fruiters. The selected seeding plot, with the altitude of 800 m to 1800 m, should be located at a leeward and well-drainaged and sunlit place, such places as the foot of a moutain, a gentle slope, a flat plain or a groove flat plain, a sunlit slope or sunlit hemidome, etc,. There are some other requirements of the soils: the soil should be deep and rich sandy soils, light loamy soils or loamy soils with good air penetrability and a slope of under 15°.

②Soil Preparation: Soil preparation need to be completed carefully: the plot should be plowed deeply and fully with the depth of more than 40 cm; the harrowing of the plot should be done evenly on the base of deep plowing in order to improve the acidity of soil, to

increase the organic content of the soil and to increase the soil fertility.

③Seedbed: Invariably adopt the type of high seedbed or high seed plot: the level of the seed plot with the width of 1.2 m is 15 cm to 20 cm higher the woling groove of the width of 25 cm to 35 cm; the length of the seed plot dependeds on the landform.

④Soil Desinfection: Spray trichomonas killer 5 kg and carbendazol 7.5 kg per hectare to have the soil undergone soil disinfection, sterilization and desinsection.

(2) Root Stock Breeding: Gather all the seeds newly harvested and intensively put them in seedling bed to breed, inspecting it weekly to see the budding situation.

(3)Engrafting

① Graft: The scion wood must be culled from female parent garden or other original plant of fine breed. It is required to have conformity certification, free pratique and fine breed certification.

②Engrafting: Adopt the way of bud grafting, after grafting, plant it in the nutrition barrels.

The technological process of fine breed nursery stock breeding is as follows：

(4) Culturing Management

Culturing Management: Plant the nursery stocks in the late March before or after they sprout (planting those 1-2 year old nursery stocks can keep higher survival rate) , after planting, water them fully and enhance the field management and often scarify the soil and weed, take care to drain away water in the rainy season and in June or July pay close attention to prevent and control plant diseases and insect pests; in the growing period, have the branches trimmed, notice that do not trim them after leaf fallen, or result in bleeding and influence the growth vigour of the trees.

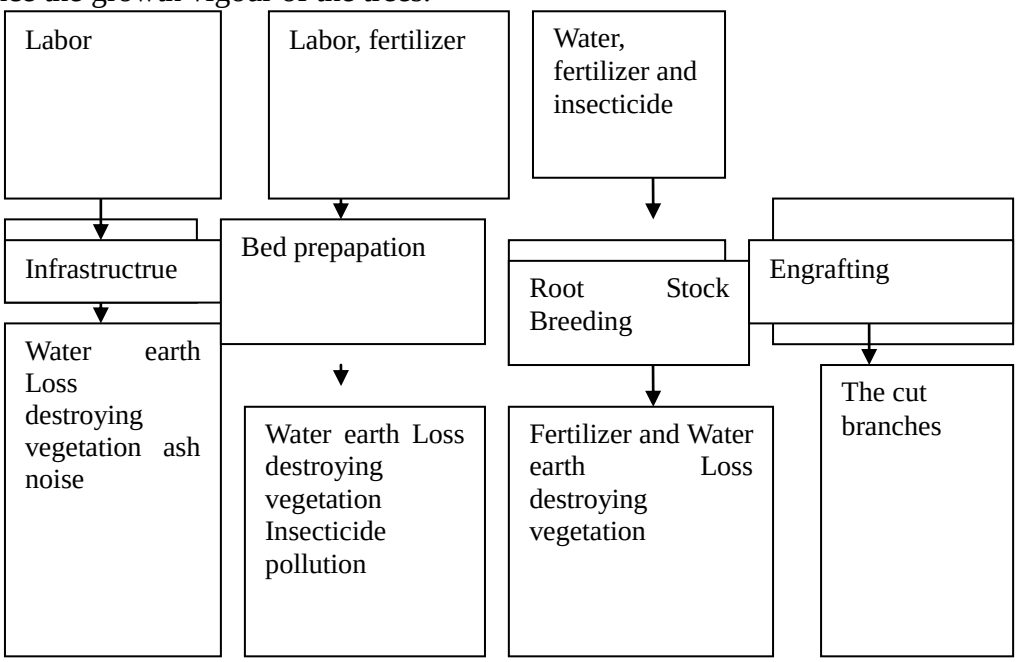


Figure 5.1.1-2 The technological process of fine breed nursery stock breeding

(5). Economic Fruit-bearing Forest Fine Breed Breeding

Digging the setting holes: make certain the place of the plant in the planned area, with lime at the plant and row spaceing of 3.5 mx5m; plant 570 plants per hectare or 38 plants per mu; at the marked setting point dig a columnlile hole with the diameter of 1 m and the depth of 0.8 m;apply base fertilizer(farmyard manure + phosphatic fertilizer) farmyard manure 50 kg, oil cake 2 kg, organism Organic bacterial manure 2 kg per hole, by three layers apply it intothe setting hole and tread down to solid. the top layer is at the same height as the earth surface and then pile up a steamed bread-like heap with the pure surface

soil with the height of 20 to 30 cm for setting.

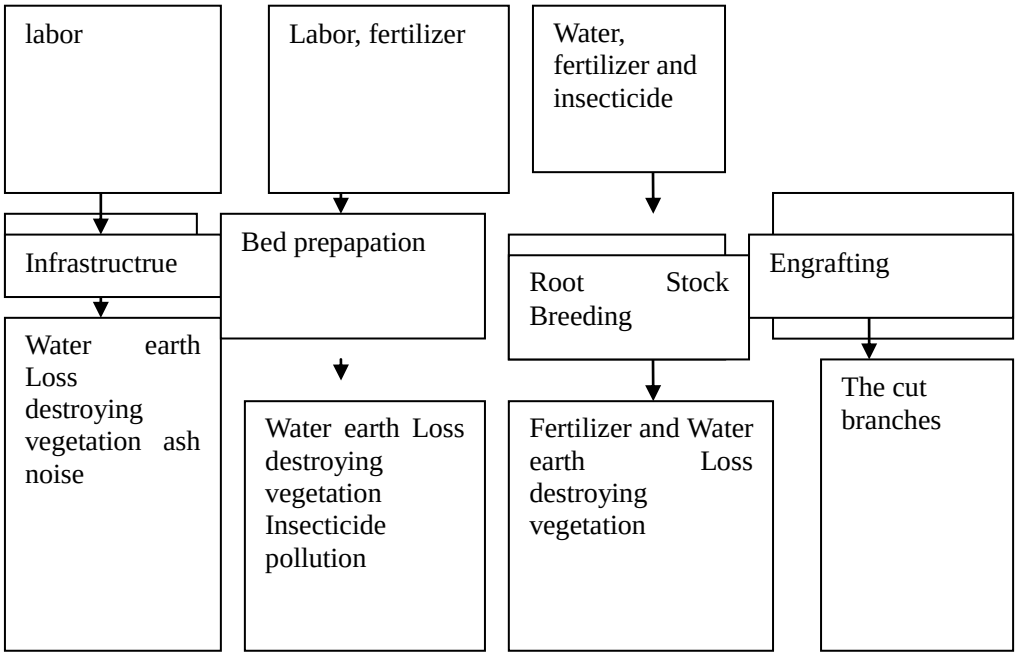


Figure 5.1.1- 3 The technological process of walnut culture

3. Chinese medicinal planting (take Pueraria lobata and gastrodia elata for example)

● Pueraria lobata Planting

Pueraria lobata planting, basically, is much like that of potato planting, and see Figure 5.1.1-1 for the details of planting technological process, here is no repeat.

Extermination of disease and insect pest: the plant diseases and insect pests of the arrowroot seedlings is mainly the downy mildew, aphids, and mites and other suchlikes, and it is feasible to apply Folimat, Abamectine, ridomil mz, etc., medicaments to prevent and control.

Harvest: The arrowroot block harvest can be completed in the early spring or after the hoar frost descends in the late fall, most are harvested in the late fall. When harvesting, it is feasible to deeply dig the bigger roots and reserve the rootlets and let them continue growing to be harvested two or three years later.

● Gastrodia elata Planting

The Gastrodia elata Planting parts of this project are carried out mainly in Dejiang County; The habit of growth of gastrodia elata is suitable for planting and growing in the loosened and wet sandy soil, the optimum temperature for growing is 15-28℃, when the ground temperature is under 8℃ or higher than 30℃, the growing of gastrodia elata stop. Gastrodia elata is not that of autotrophism, and the growing of gastrodia elata must depend on honey fungus.

（1）Technological process of Gastrodia elata Planting

Soil Selection and Soil Preparation: It is suitable to select the partially shaded or partially sunlit, rich of organic matter(OM) gentle slope or groove plain as the planting plot, (well-drainaged sandy loam or sandy soil , and the virgin soil especially better.) Digging Holes: length 70 cm, width 60 cm, depth 40 cm wtih the interval spacing of 1.5m; bed a layer of wet dull leaves, levelly bed a layer of nightsticks or branches and place the cultivated honey funguses between the nightsticks or the branches, and then plant the gastrodia elata tubers between two sections of nightsticks at the interval spacing of 15 cm, fill and level up the holes with the sandy loam with good air penetrability or humus earth, and then bed a layer of wet withered leaves again, the covering earth is 10 cm thick, finally

cover the hole with a layer of leaves and weedsIt is feasible to keep the humidity to prevent the moisture evaporation, prevent too solarizing and drought, preserve the heat to prevent prevent frostbite, prevent topsoil harden and insulate the source of disease and pests, and so on.

The propagation methods: It is general to use tubers for propagation, and it is possible to use seeds for breeding.

① Tuber propagation: winter planting or spring planting The winter planting gastrodia elata have a high inoculation rate, grow fast and the growing period is 11 months. The season for spring planting is in March or April. Cultivate the fungus bed before planting. Ther tree species suitable for honey fungus growing are those broadleaf trees of thick barks, hard character and strong rotproofness.

②Seed Breeding: Select arrowlike gastrodia elata with the weight of more than 100 k, as the methods shown above, plant it immediately after picking it up, prevent the sunlight when it producing shoots, and when it blossoms it is required to take artificial pollination. The time for pollination can be selected at 10 o'clock a.m. of a fine day, take artificial pollination only when flower appears a little from the bud. After the pollination, enclothe the fruit spikes with a plastic bag, and when the underneath fruit spill out some seeds, take in the seeds in bottom-up appoach if ripe. As the seed longevity of gastrodia elata is short, so capsularfruits taken in should be planted in time.

Field Management: After planting, it is required to take good care of the field management, strictly prohibit trampling gastrodia elata of either human beings or animals. Thicken the covering earth before owerwintering and add covering leaves to prevent frostbite; in the altithermal period from June to August, it is necessary to build shed or intercrop other tall stem crop in order to shade the gastrodia elata, before the coming of the rainy season, clear the drainage and the seeper to prevent the tubers of gastrodia elata rotting. Spray the new high-fat membrane emulsion for agriculture in order to keep the humidity and keep the temperature to prevent frostbite.

Harvest: The harvesting season is generally in seasons of the temperature under less than 12℃, under that condition, the gastrodia elata lie in hibernation period, so November and December is the best season to harvest, accordingto processing condition, harvest the gastrodia elata in turn.

The technological process of gastrodia elata culture is as follows:

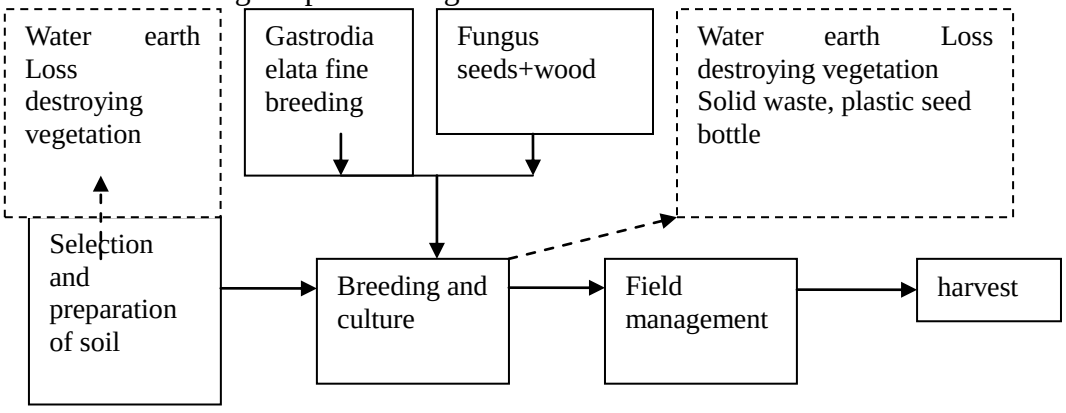


Figure 5.1.1- 4 The technological process of gastrodia elata planting

Remark: The standardized culture technology of imitating wildness of gastrodia elata without insecticide, fertilizer, and mulching film, etc. The establishment of gastrodia elata base can continually satisfy the market requirement, effectively control the overuse of the wild gastrodia elata and therefore protect the idioplasm resource of the gastrodia elata and recover the natural productivity of gastrodia elata. At the same time control picking discretionarily and overpick, effectively protect zoology of producing area and biodiversity.

In the course of field culture, the hole digging may influences the the earth's surface to

some extent and results in the increase of loss of water and soil, at the same time, as a large-scale culture activity takes place in the gastrodia elata primeval forest, it will cause the habitat of some certain species to undergo destruction, and thus disturbs the normal growing and propagation activity of them.

4. Edible fungus planting (take mushrooms for example)

(1) Production Management: culture season selection: conventionaly, the planting season is January to March in spring, and July to September in fall, the fall season is more suitable.

Fungus Seeds selection: select Fungus of the right age Seeds of high quality, high yield, robustness and of good commercial property. Among the mushrooms The bacterial strain of Qingke 20, 135, 939, 241-4, and 937 are suitable for Guizhou Mount Wuling area.

(2). Culture medium making

The nourishment is mainly comprised of ①wood-shavings 78%, wheat bran 20%, sugar 1% , gypsum 1% . ②wood-shavings 78％, wheat bran 16％, gypsum 2.5％, superphosphate 0.5％. .

(3) Bagging Culture: the thin film tube or thin film bags exclusively used for mushrooms culture include:low pressure polyethylene, polypropylene, high pressure polyethylene etc. three kinds, different mushroom culture bases can select different types of plastic materials(he thin film tube or thin film bags) according to their own situation, and to cut the plastic materials into bags of 50-55 cm long, tying one one end before loading and meltsealed, of course, it is possible to use fold cornered bags. It is required to load compacted and equal.

(4) Sterilization: The operating pressure of the high compressed steam sterilization way is 0.15 MPa, keep that temperature for 1.5-2.0 hours, and the operating pressure of the normal pressure sterilization way is zero, the temperature can reach 100℃ and keep the temperature for 10- 12 hours. Cool fungus bags after sterilization, and carry them into the cooling chamber to cool them down to under 28℃.

(5) Inoculation Culture

Drilling Hole Inoculation: On completing the process, strictly comply with asepsis operation technical requirements, load material bags and Fungus Seeds inoculation box (or aseptic room): inoculation box --space disinfection--surface of material section alcohol disinfection--stiletto--inoculation--bags culture chamber culture.

Culture: culture is completed in the culture chamber with the temperature controlled at 23℃- 27℃ and the relative air humidity not above 60％ . After 5days to 7days' culturing, take once turnover, and inspect the fungus shooting and growing situation and whether or not infected by sundry funguses, pollution bags (if any) should be treated in time.

Culture Period: Generally, withing 60d-90d, the mycelial can overgrow full of bags.

(6) Taking off from the bags: Taking off from the bags time is generally, 5days to 7 days after overgrowing full of bags.

(7) The mushrooms production management

cold frame design: farmland of 1.4 m wide, can stand 8～ 9mushrooms fungus sticks. farmland is of 15 cm tall. The length is 10-15 m, advisable. The space between farmlands with the width of 40 cm can be used for walking on. First open the soaking gutter with the width of 60 cm and the depth of 70 to 80 cm, before starting the course of culture. The gutter length depends on the landform nearby.

Setting up rowing fungus frame: fungus stick can not be laid levelly on the farmland bed, under most circumstances, they are laid scalelikely slanting on the farmlands, it is required to build frame on the beds.

Mushroom Hastening: increase the day and night difference in temperature--generate

anlage--differentiation of mushroom buds--4days to 5days poikilothermic treatment--increase ventilation--condition the relative air humidity tp 80％ or so.

(8)The management for the growth period of fruit body formation

(9) Harvest

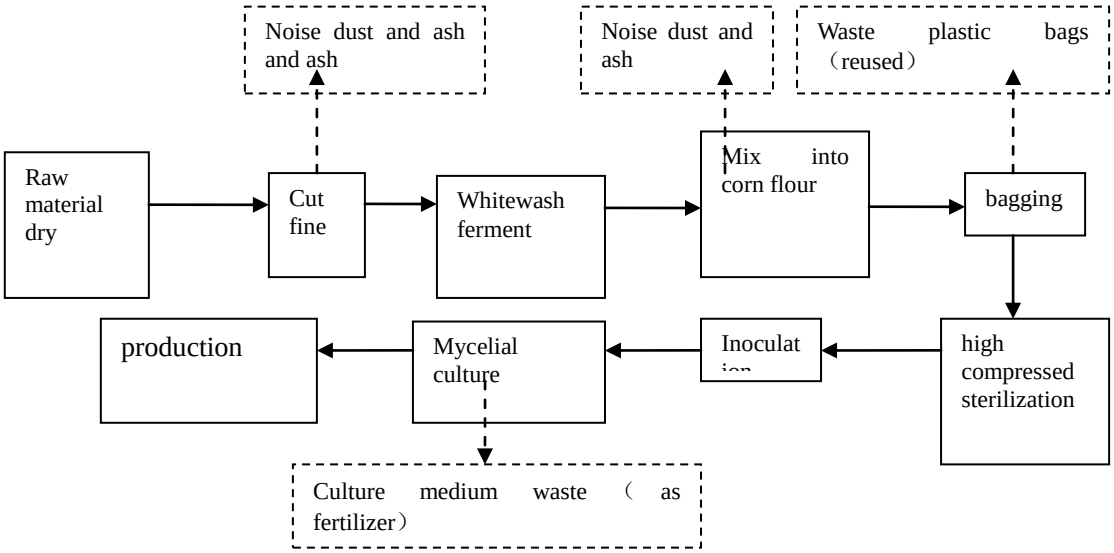


Figure 5.1.1- 5 The technological process of edible fungus

5. Vegetable Planting (take autumn celery cabbage for example)

(1) Select good disease-resistant breed.

(2) Meticulously Prepare Soil and Fully apply the base fertilizer: In reference to the ranking criteria of soil fertility of vegetable land soil, it is advisable to apply rotten organic fertilizer 5000kg and diammonium hydrogen phosphate 25 kg, potash fertilizer 15kg or compound fertilizer50 kg per mu.

(3) Seeding at suitable timeIt is suitable to seed on March 3rd to 8th, mix the seeds with new high-fat membrane emulsion for agriculture and medicaments before seeding, (Select subtilis powder and metalaxyl to mix).

(4) Standard planting. Adopt little-high farmland methods to plant, the length of farmland is not more than 20m, with the model of one blank row in every four rows or one blank row in every six rows

(5)Densely plant reasonablyIt is advisable to set the seedlilngs in the late of August, 1800 plants to 2000 plants per mu.

(6) Enhance the Management Seedling Period "After three times watering, the seedling will all come out, and five times later, it is necessary to be set"; prevent and control aphids, cabbage caterpillar in time, it is possible to selcet and apply new type of pollution-free insecticide organism soap or cypermethrin cream, etc..

(7) The Management of rosette stage, especially, restraining the growth of seedlings (for root development). The period of estraining the growth of seedlings depends on seedlings situation, generally, the period lasts 10days or to 20 days, when it grow to 22 leaves, apply urea 20kg or ammonium sulphate 50kg, and then water them, cultivation before estraining the growth of seedlings. Extermination of disease and insect pest: continue preventing and controlling aphids, and cabbage caterpillar, take care to prevent downy mildew and alternaria stem rot.

(8) Enhance the Management heart-wrapping PeriodThe task in the phase is mainly fertilizing, watering and extermination of disease and insect pest. In terms of the regutations of the fertilizer requirements of celery cabbage, adopt single-use way to apply the additional fertilizer, it is emphasized to apply additional fertilizer by stages to reduce the unreasonable

phenomena of shortage of fertilizer in the late period or overapplying in the early period.. What's more, it is required to prevent and control once more, combining withthe disease prevention, the insect pest, especially, aphids to ensure the quality of the products.

6. Tea leaf planting

(1) The basic environmental condition of the production base

① Air environment quality and irrigation water quality of the base shoud comply with the requirements of the environmental condition industry criteria(NY5020-2001) of pollution- free food tea production, soil texture good and no pollution and accord with criteria.

② Far from the towns, factories, and there are no other direct or indirect pollution sources.

③Have the basic establishing condition for tea plant well growing, i.e., PH of the soil:4.5～6.0, deep topsoil, effective soil layer more than 1m, nutrient rich and balanced, 0 ～ 45cm topsoil containing organic content >=15g/Kg, effective nitrogen content>=20mg/Kg, effective kalium content >=100mg/Kg, effective phosphorus >=20mg/Kg, not lack of magnesium, zinc etc.,. 100 cm under Groundwater level, annual amount of precipitation >1300mm and the accumulated temperature of 10℃>3700℃ , perennial relative humidity more than 80%.

④ Keep the place of production, processing and storage and the ground around clean.

(2) Tea leaf garden reclamationAfter selecting the soil, first clear away the weeds on the ground, trees, ripraps, and earth piles, etc., and then elementary cultivate with the depth of more than 50 cm, clear up the weeds, roots and perennial roots, etc.; before planting, recultivate it.

(3) Fully apply base fertilizer: Deeply cultivating and applying fully bae fertilizer is to deepen the live topsoil and create the best condition for the development of the root system of the tea plants, thus provides enough fertilizer for the tea plants to grow. Generally, the depth of cultivation is more 50 cm, combining with applying certain quantity of organic fertilizer as the base fertilizer, and nitrogen, phosphorus and kalium are in suitable rate. Apply farmyard manure 1500～2500Kg or oil cake 200～ 300Kg and 50～100Kg per mu. Mix up the fertilizer and the earth, and then cover it with earth of 5～10cm higher than the ground level.

(4)Select suitable fine breed: It is necessary to select the provincial level or national level fine and clone breed suitable for the tea leaf garden in our county and with the characteristics of high yield, high quality, robustness, early shoot, character orderly.

(5) Reasonably Dense Plant: double rows and double plants, large row spacing of 150cm and small row spacing of 40cm, and the plant spacing is of 30cm.

(6) Interplanting Osmanthus fragrans:

Interplanting Osmanthus fragrans is to fully exploit the interval land between the tea treas and to reduce the quantity of weeding labor, and thus is to keep the water and the soil from losing, and reduce the fulfilling of the tea garden, in a word, to produce greater economic benefit in limited land resource. The picked tea leaves in this method can be directly prepared for osmanthus flower tea to imrove the tea quality and to save the tea making processing and the cost of tea making. The methos of interplanting Osmanthus fragrans trees in the tea garden is according to the regulation: the row spacing and plant spacing: 25cm× 1.5m, and the distance from the Osmanthus fragrans seedlins to the tea plant: more than 50 cm. By this density, Interplanting causes the vegetation under the wood, and, especially, the tea garden are mostly on the slope or hills, is not suitable for waterhead self-restraint and to keep the water and the soil.

5.2 Impact assessment of husbandary activities

5.2.1 The breeding process and the impact analysis

The project is mainly involving pigs, sheep and chickens. The breeding area has rich forage grass resources and the place has formed a certain breeding habits., in which Nayong County of Bijie City develops the waxy valley pigs (2000) breeding with the local characteristics. The breeding way is in the form of scattered farmers farming, not central breeding. Wuchuan County of Zunyi City (ewe 5600 and stock ram 280) develops Guizhou white goat well-bred breeding. The breeding way is retail farming with half barn feeding and half stabling. The place where the chicken are bred involves Weining County of Bijie (240,000), Yinjiang of Tong Ren (90,000) and Shiqian (50,000). The breeding ways are concentrated in captivity of cooperation and peasant household.

Breeding project are mainly cattle fattening and poultry eggs, in which the waxy valley pig of Nayong contains slaughter process. The details of the slaughterhouse will be mentioned in product processing. The wastewater mainly comes from livestock urine and excretion and the wastewater to wash livestock and poultry housing. Stench comes largely from livestock and poultry manure and dung compost. Solid waste mainly comes from livestock and poultry manure and the dead livestock during the breeding process. Noise mainly comes from the livestock and poultry.

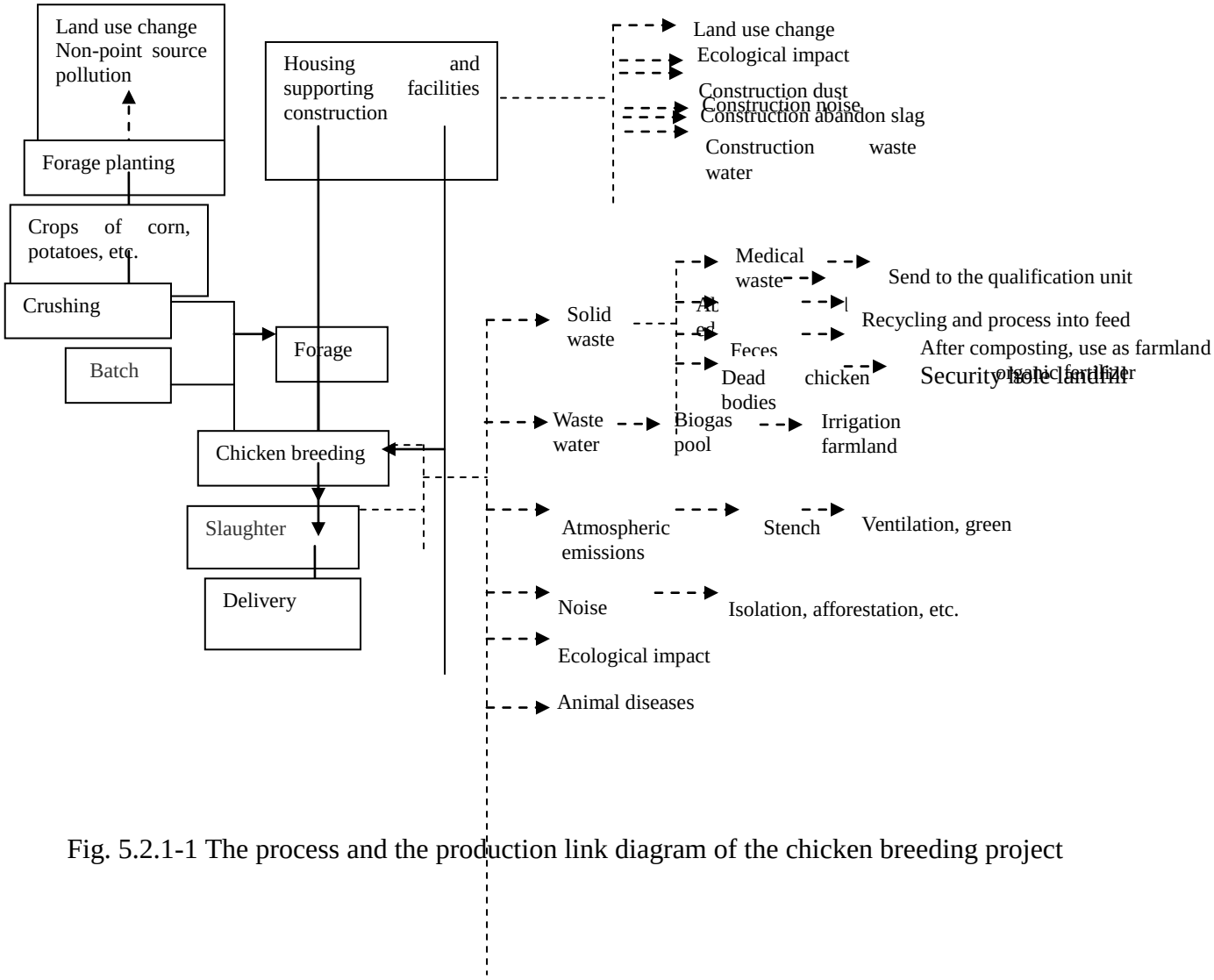


Fig. 5.2.1-1 The process and the production link diagram of the chicken breeding project

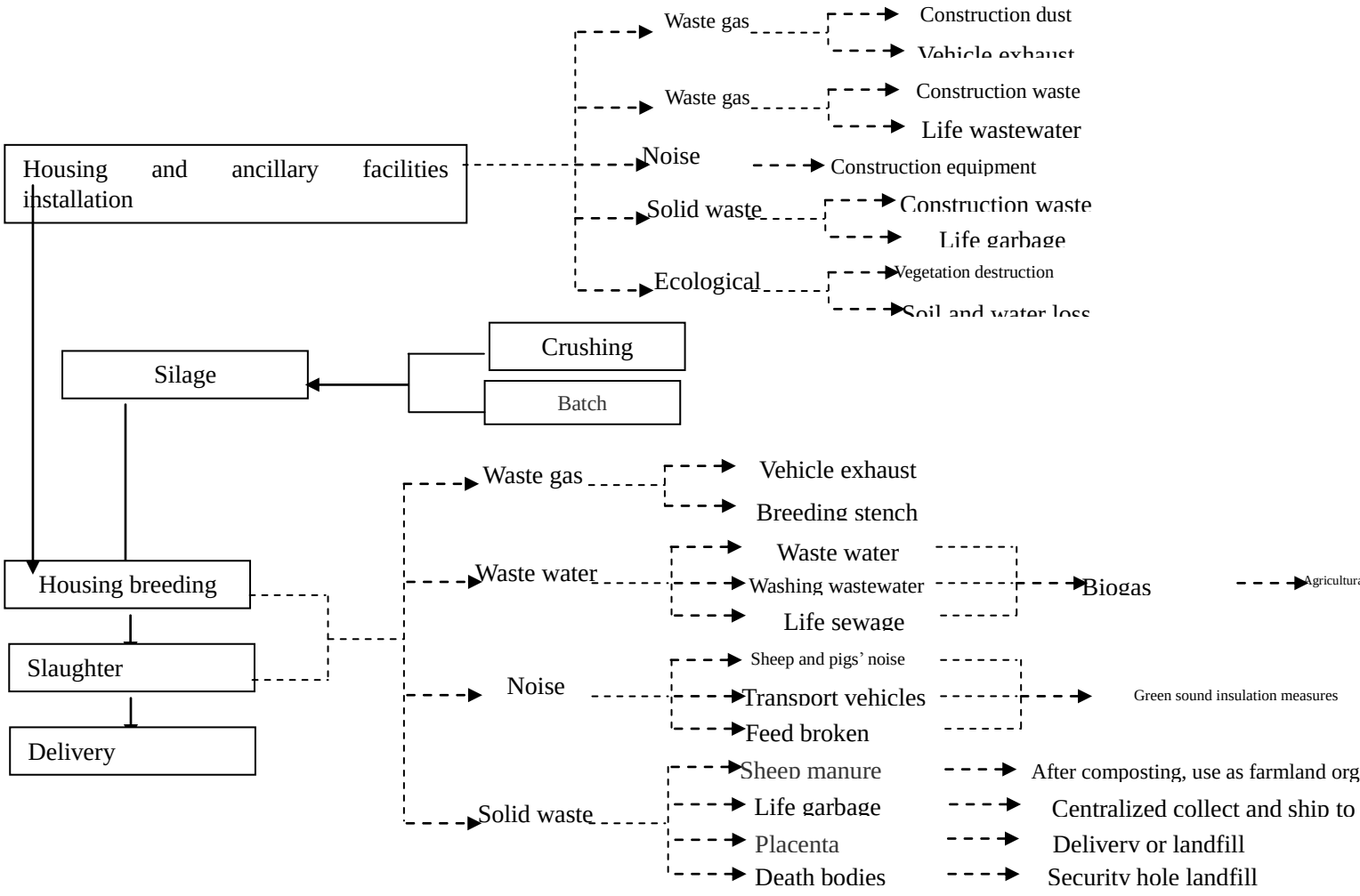


Fig. 5.2.1-2 The process flow and pollutants producing figure of the breeding project of white goat improved variety and waxy valley pigs

5.2.1 The surface water environmental impact analysis

According to the survey of the current status, the water using of the breeding project area are solved through mountain plateau pond or self-study reservoir, with the reference to the animal husbandry water quota in Guizhou industry water use quota. The water used in breeding project is shown in the following Table 5.2.1-1.

Table 5.2.1-1 The livestock water consumption of each project area

No.	The county to implement the project	The product name	The fixed value(L /one•day)	Scale	Water consumption (m3/d)
1	Nayong County of Bijie City	Wax valley pigs	20	2000	40
2	Weining County of Bijie City	Laying hens	2	240000	480
3	Wuchuan County of Zunyi City	Goats	20	5880	117.6
4	Yinjiang County of Tongren City	Laying hens	2	90000	180
5	Shiqian County	Laying hens	2	50000	100

	of Tongren City				
The total amount of water used：917.6 m^3/d					

Aquaculture water is provided by the mountain plateau pond. There is perfect mountain plateau pond in the project area. This project is given priority to individual farming, so it does not cause livestock drinking water problems. The laying hens breeding of Weining County of Bijie City is dispersed in eight different villages, each of which has a breeding scale of 30000. The daily water consumption is about 60 m3 / d. The drinking water of the project area is relatively abundant and the poultry can be satisfied.

The wastewater of breeding projects is mainly the wastewater of housing washing and livestock urine in the process of breeding.

The housing carries out dry nightsoil process technology. The maximum allowable displacement of dry nightsoil process technology in Table 4 (calculated in accordance with the summer) according to the livestock and poultry breeding industry pollutant emission standard (GB18596-2001).

Table 5.2.2-2 The livestock displacement of each project area

No.	The county to implement the project	The product name	The fixed value	Scale	Displacement (m3/d)
1	Nayong County of Bijie City	Wax valley pigs	1.8m^3 /hundred•d	2000	36
2	Weining County of Bijie City	Laying hens	0.7m^3 /thousand•d	2400,00	168
3	Wuchuan County of Zunyi City	Goats	0.6m^3 /hundred•d	5880	35
4	Yinjiang County of Tongren City	Laying hens	0.7m^3 /thousand•d	90,000	63
5	Shiqian County of Tongren City	Laying hens	0.7m^3 /thousand•d	500,00	35
The total displacement：337m^3/d					

Note: According to The construction and investment guide of rural small livestock and poultry breeding pollution prevention and control project (issued by Ministry of Environmental Protection on November 11, 2013), according to three sheep can be converted into 1 pig, the fixed value of breeding sheep is：0.6m^3 /one hundred•d.

Breeding wastewater contains livestock urine and housing washing wastewater, with high concentration organic wastewater, large amount of nitrogen and phosphorus and suspended solids, bad smell, high pollution load. There were significant differences with the breeds, the raising and management level, climate, season, etc. This project adopts dry nightsoil way. The concentration of the wastewater is in accordance in the main water pollutants of livestock and poultry breeding and properties of Table A2 of The best feasible technical guide of the pollution prevention and control of large-scale livestock and poultry farms (trial). The waste water and pollutants are in Table 5.2.2-3.

Table 5.2.2-3 The table of waste water and pollutants of the project

The county to implement the project	Types of wastewater	Waste water quantity (m^3/a）	Indicators	Pollutants			
				COD	NH3-N	TP	TN
Nacuo County	Pig wastewater	13140	Concentration（mg/L）	2770	290	50	420
			Discharge（t/a）	36.40	3.81	0.66	5.52
Weining County	Chicken wastewater	61320	Concentration	10500	600	60	750

			（mg/L）				
			Discharge（t/a）	643.86	36.79	3.68	45.99
Wuchuan County	Sheep wastewater	12775	Concentration（mg/L）	1790	300	40	60
			Discharge（t/a）	22.87	3.83	0.51	0.77
Yinjiang County	Chicken wastewater	22995	Concentration（mg/L）	10500	600	60	750
			Discharge（t/a）	241.45	13.80	1.38	17.25
Shiqian County	Chicken wastewater	12775	Concentration（mg/L）	10500	600	60	750
			Discharge（t/a）	134.14	7.67	0.77	9.58

Note: The wastewater concentration of breeding sheep is obtained by analogy

From the perspective of ecological agriculture, this project carries out farming combined. In the breeding project, the dry dilute separation rate is high, which reaches over 90%. As a result, the biogas production rate of the biogas pool may be low. So in the project, the large part of the dried dung will return after being put into the compost and carry out composting process; and the other part of the dried dung will be added into biogas pool to adjust water quality in order to ensure the project can meet the requirement of the biogas production rate.

Breeding pig is a household farming, with faeces and urine separating. The pigsty which is newly built and rebuilt will be laid cast iron or cement ground with the size of 1.1m-1.5m. Under the ground, a layer of manure ditch with the eight of 0.6m-0.8m, the width of 1.1m-1.5m and the slope of 1.0% will be built. Water won't be used to rinse the pigsty. Urine and part of the pig will automatically leak into the manure ditch through the ground. There is special urine pipe in the manure ditch. Urine faeces and urine separation is achieved by urine getting into the pool through the pipeline. Part of the pig manure which is not leaked will be collected by manual work. The waste produced by the project will be cleaned, which effectively reduce the harmful gas and smell in the housing. After anaerobic digestion process, the wastewater can be used in farmland fertilization. The methane fuel can be used as life fuel for the owner itself or the surrounding farmers.

The wastewater after anaerobic digestion fermentation and +SBR can be used in irrigation. The wastewater will not be discharged to the outside. So it has only a little impact to the ground water.

It is proposed that the poultry farm to use leak floor, which can realize the dry nightsoil process of separation process of dry wet.

5.2.2 The groundwater environment impact analysis

The livestock using water of this breeding project is provided by mountain plateau pond or self-built reservoir, which does not involve the groundwater. So it will not affect regional groundwater table or the groundwater water resources. The polluting ways to the groundwater of the breeding project in operation period mainly include:

(1) Breeding project uses septic tank as a temporary storage and treatment facilities. The impervious layer of septic tanks ruptures or sealing adhesive seam is not thick or the sewage pipeline ruptures will cause the penetration of the pollutants and pollute the shallow groundwater. The possibility of this pollution pathway is little and it is not easy to be found.

The pollution and the influence is serious. So the management shall be strengthened to avoid the situation.

(2) The improper measures of prevention and control of the livestock manure temporary storage area is easy to generate leachate and pollute the groundwater.

(3) In heavy rain day, if the drainage of rainwater is improper, the rainwater containing toxic or harmful substances will diffuse into the earth's surface near the livestock housing, which will produce pollution to the groundwater.

(4) Aquaculture wastewater is not discharged outside, part of which will return to the farm after processing. It may have some impact on the regional groundwater.

5.2.3 Acoustic environmental impact analysis and forecasting

The noise of the breeding project is mainly from pigs. The noise source is 75 ~ 85 db (A). The noise can be approximately regarded as point source, which only needs to consider the different distance attenuation of the noise, to calculate the contribution values of the sound source to the nearby sensitive protection target, and to analyze the contribution values of the sound source. And its attenuation model is as follows:

$$Lp=Lpo-20\lg(r/ro)-\Delta L$$

In which,

Lp—— Construction noise prediction values which is rm from the sound source, dB（A）;

Lpo——Reference sound level which is rm from the sound source, dB（A）;

ro——Lpo The distance of measuring points of noise (5m or 1m), m.

ΔL——The noise attenuation after taking various measures，dB（A）。

According to point source attenuation prediction model, calculate the attenuation of noise with the distance, which is shown in the table below.

Table 5.2.2-4 Noise prediction of cow at different distances

Noise source	The original noise	The noise after attenuation, dB（A）				
	dB（A）	10m	15m	20m	40m	60 m
The noise of the cow	80	60	56.5	54.0	47.9	44.4

According to the prediction of noise, without considering attenuation, at the distance of 10m, the contribution value of the noise is 60 db. The breeding project is located in the Class 2 areas which is stipulated in *The acoustic environmental quality standard* (GB3096-2008). If measures are not taken, the noise at night may be partial to exceed bid.

5.2.4 Atmospheric environmental impact prediction assessment

The waste gas of the breeding project is mainly the foul gas produced by the housing and temporary fetor. Livestock manure is mainly produce the harmful gas such as ammonia and hydrogen sulfide. In the case of not cleaned timely treatment, the smell will be multiplied, and further produces methyl mercaptan, dimethyl sulfide, methyl sulfide, dimethylamine and other stench gas and breeds a large number of flies, which seriously affects the environment. The physical and chemical properties of the main stench materials are shown in Table 5.2.2-5.

Table 5.2.2-5 The physical and chemical properties of stench materials

The stench materials	Molecular formula	The olfactory threshold（ppm）	Odor characteristics
Trimethyl amine	$(COH_3)N$	0.000027	Smelly fish smell
Ammonia	NH_3	1.54	Pungent smell
Hydrogen sulfide	H_2S	0.0041	Rotten eggs smell
Fecal odor base sulfuric acid	——	0.0000056	Dung smell

The breeding project belongs to the individual farming. The waxy valley pigs farming scale is 10 pig each farming village. And the chicken farming scale is focused and free-range combination. In Weining County, 20 households will be considered as a family farms with 1500 chickens each household.

According to the research data investigation and comparison to *the biological control technology of the stench materials in the large-scale farms which is urgently to be solved* (Zhang Kechun, Ye Chengrong), the NH_3 and H_2S emissions into the atmosphere of a ten-thousand pig farm will be 15.9kg/h and 45 kg/h. According to *The rural small livestock and poultry breeding pollution prevention project construction and investment guide* (issued by Ministry of Environmental Protection on November 11th 2013) the conversion method of the position is: 20 laying hens are converted into 1 pig and 3 sheep converted into 1 pig. So a ten-thousand chicken farm will discharge NH_3 0.795kg/h and H_2S 0.0725kg/h to the atmosphere and a ten-thousand sheep farm will discharge NH_3 5.3kg/h and H_2S 0.48kg/h to the atmosphere. The pollutants situation is shown as bellow in Table 5.2.2-6.

Table 5.2.2-6 Waste gas pollutants

No.	The counties to Implement the project	Product names	Scale	NH_3（kg/h）	H_2S（kg/h）
1	Nayong County of Bijie City	Waxy valley pigs	2000	3.18	0.29
2	Weining County of Bijie City	Laying hens	240,000	19.08	1.74
3	Wuchuan County of Zunyi City	Goats	5880	3.12	0.28
4	Yinjiang County of Tongren City	Laying hens	90,000	7.12	0.66
5	Shiqian County of Tongren City	Laying hens	50,000	3.98	0.36

The largest emission amount of NH_3 of the wax valley pig farming housing of Nayong County is 3.18kg/h (15.9g/h per family). The largest emission amount of H_2S is 0.29kg/h（15.9g/h per family）. The largest emission amount of NH_3 of the chicken farming housing of Weining County is 19.08kg/h（2.39kg/h per family）and the largest emission amount of H_2S is 1.74kg/h（0.22kg/h per family）.

The project area is located in the rural areas with better environment quality present situation. Strengthening housing daily management, keeping the housing clean and timely cleaning the manure, etc, can effectively reduced the impact of the foul gas on the surrounding environment.

5.2.5 Solid waste environmental impact analysis

After the breeding project facilities, solid waste is mainly the livestock excrement, feed residue, feed processing collecting dust, dead animals, etc.

1. Livestock manure

According to the laws of The law of livestock and poultry breeding pollution control engineering and technical specification (HJ497-2009) and The technical specification of livestock and poultry breeding pollution prevention （HT/T81-2001）, the breeding project adopts dry nightsoil technology on housing. The dry nightsoil technology is to set a slope on the ground of the pig and chicken houses, which can separate the dry and wet. Fecal leaks on the slope, which realizes the feces and sewage automatic separation within the housing. Dried dung will be cleaned by manual work every day. The residual excrement and urine wastewater discharge from the sewer and get into the collection system, where they will be processed respectively.

In accordance with the feces excretion of different livestock and poultry in Table A2 of Appendix A of The law of livestock and poultry breeding pollution control engineering and technical specification (HJ497-2009) , the feces excretion of this project can be obtained.

Table 5.2.2-7 Feces pollutants condition

No.	The counties to implement the project	Product names	Scale	The fixed value（kg/a）	Annual feces excretion t/a

1	Nayong County of Bijie City	Wax valley pits	2000	398	796
2	Weining County of Bijie City	Laying hens	240,000	25.2	6048
3	Wuchuan County of Zunyi City	Goats	5880	133	782
4	Yinjiang County of Tongren City	Laying hens	90,000	25.2	2268
5	Shiqian County of Tongren City	Laying hens	50,000	25.2	1260

Note: the fixed value of goat is calculated according to 3 goats is equal to 1 pig.

After artificial collection, livestock manure shall be sent to temporary dried dung yards. The main task in the pretreatment stage is to reduce the moisture content, adjust water and carbon nitrogen ratio. Sometimes bacteria and enzymes are needed in order to promote the fermentation process. The primary fermentation stage supply oxygen to accumulation through mechanical pile. Then the organic matter further ferment. The fully mature compost product will be produced which does not need ventilation. Flipping is needed once a week.

2. Feed residue

Feed residue which can be collected shall be collected and processed and be used as feed. The part which cannot be collected shall be fermented and be used as compost with livestock manure.

3. The death of livestock and livestock deaths

1）Dead livestock

To deal with the dead livestock bodies shall be in strict accordance with the requirements of the processing of health and epidemic prevention. The dead bodies shall be dealt with by qualified unit. Farmers should archive all the processing and other related formalities of all dead livestock in order to facilitate the supervision and management of the environmental protection department.

In the case of no infectious diseases, the pig fatality rate is calculated according to 2% of the total number and the chicken fatality rate is calculated according to 10% of the total number. According to the requirements to the treatment and disposal of bodies of dead livestock and poultry in the technical specification of livestock and poultry breeding pollution prevention (HJ/T81-2001), the village in the project generally do not have the burning conditions to the death bodies. More than three safe landfill wells shall be set, which will be reinforced concrete structure. The depth shall be more than 3m and the diameter shall be 2m. The wellhead shall be affixed a seal. During the process of landfill, after inputting the livestock and poultry bodies each time, a layer of hydrated lime with the thickness of more than 10cm shall be covered. After the landfill, clay must be used to compaction and sealing.

Table 5.2.2-8 The situation of the deaths of the breeding animals

No	The county to implement the project	Product name	Scale	Annual death rate	The number of death	Weight（kg）	Hazardous waste（t/a）
1	Nayong County of Bijie City	Wax valley pigs	2000	2%	40	30	1.2
2	Weining County of Bijie City	Laying hens	240,000	10%	24000	1.5	36
3	Wuchuan County of Zunyi City	Goats	5880	2%	118	50	5.9
4	Yinjiang County of Tongren City	Laying hens	90,000	10%	9000	1.5	13.5
5	Shiqian County of Tongren City	Laying hens	50,000	10%	5000	1.5	7.5

2）The primary livestock deaths

The factors of hypoxia, dystocia, sow viral diarrhea virus infection, low immunity of primary livestock, etc. are easy to cause primary livestock deaths. According to the general

breeding experience, through strengthening management, piglet mortality is about 15%. Primary livestock contains some bacteria, which may endanger the health, so it is unfavorable use. Therefore, the EIA suggests to carry out landfill treatment on primary dead animals according to the treatment and disposal requirements to dead livestock and poultry in *The livestock and poultry breeding pollution prevention* (HJ/T81-2001).

4. Medical waste

During the breeding project operation period, conducting quarantine and treatment to pigs and chickens will produce medical waste. Medical waste is hazardous waste, which must entrust a relevant waste treatment qualification units.

Project area is located in remote rural areas, so the disease prevention and control is partly done peasants' home, the abandoned medical supplies are optionally thrown away, which does not form effective collection storage and transportation. The expired medicines and waste medical instruments are collected and stored and unified sent to the landfill periodically. Landfill is always near water without concentrations around residential areas, schools and other environmental sensitive areas. The landfill area location shall be chosen after careful consideration. The geological shall be stability with low water level and high seepage coefficient. But the landfill area processing is simple, the environmental risk is big. And it is easy to cause underground water pollution, soil pollution and other environment impacts, which are great damage to the environment.

According to *The pollution control standard of the storage of hazardous waste* (GB18597-2001) and The national hazardous waste list, the hazardous waste HW01 and medical waste produced in the livestock and poultry breeding disease prevention in this project shall be collected and dealt with by the unit with the qualification to deal with the waste disposal.

5.2.6 Impact analysis on population health and environmental health

Livestock and poultry are hosts of a plurality of pathogenic microorganisms. If effective anti-epidemic measures and animal yard and sterilization measures are not adopted, the generation and spreading of diseases may be caused, so as to damage the body health of surrounding populations.

The infectious diseases of pigs mainly comprise foot-and-mouth disease, swine fever, pseudorabies, epidemic encephalitis B, porcine parvovirus, brucellosis, streptococcicosis, eperythrozoonosis, swine plague, swine paratyphoid, colibacillosis in pig, hydrophobia, porcine reproductive and respiratory syndrome, swine influenza, swine dysentery, swine erysipelas, mycoplasma pneumoniae of swine, swine pox and the like. Some diseases are zoonoses, such as swine epidemic encephalitis, swine streptococcosis, cysticercosis cellulosae and the like. People can be suffered from the diseases by directly contacting with the secreta and excreta of those sick animals and eating the sick animal products, and can be indirectly suffered from the diseases through various diseases.

The livestock and poultry are dispersedly cultivated in peasant households, the peasant households are closely in contact with the livestock, and the sanitary conditions are not so good, so that the peasant households are likely to be suffered from the zoonoses.

A policy of "disease prevention heavier than disease treatment" shall be persisted in the cultivation production, so as to prevent and eliminate diseases, specifically infectious diseases and metabolic diseases, so that the production performance can be developed better, the service life period can be prolonged, and the economic benefit of cultivation can be improved.

5.2.7 Impact analysis on environment

The fodders for feeding chicken and pigs mainly comprise corns and potatoes, the manure of the chicken and pigs can be applied into soil as an organic fertilizer to increase soil fertility, so as to form a good ecological cycle which is beneficial for the development

of agricultural production; and nuogu pigs, chickens and sheep are captive ways, so that the impact on local grasslands is less.

Weining Caohai national level nature protection area is located in Caohai Town, Weining County, the chicken farms of the project in Shanqiao village and Tianlong village in Caohai Town are located on the periphery of the buffer area of the Weining Caohai national level nature protection area, and is 1-2km far away from the buffer area, but pasturing is not carried out in the project area, and the impact on the zoology of the protection zone is less.

5.3 Impact assessment of agro-processing

5.3.1 Walnut processing

A walnut unshelling and processing workshop, a walnut oil processing workshops and a walnut milk processing workshops are respectively located in Yinjiang County, Hezhang County and Zhengan County, and specific construction contents and specifications are seen in the table 2.3-1 of the report in details.

5.3.1.1 Walnut unshelling processing

The walnut unshelling and processing workshop is located in the factory of Guizhou Lvlvqian Energy Science and Technology Ltd. in Yinjiang county economic development zone, the factory has already passed the environmental assessment of Yinjiang environmental protection agency in December 5, 2013, and is under construction at present, and the project is only one of increased procedures.

(1) Technological process and pollution link: a machine vision technology based on a DSP (Digital Signal Processor) is adopted to process and identify the walnut image information acquired by a CCD (Charge Coupled Device) camera, and grade according to the colors, sizes and defects of the walnuts. Qualified walnuts are packaged in a packaging line, and common walnuts enters next procedures after being unshelled; and the unshelled walnuts are screened, high-quality walnut kernels are put in storage, and common walnut kernels enter an oil preparation workshop.

(2) Main pollution processes during operation period

a. Powder: certain powder generated when the walnuts are unshelled;

b. Noise: the noise of the project is from the procedures of drying, packaging, an unshelling machine and the like, wherein the noise of the unshelling machine is larger, and the sound pressure level of the unshelling machine is 75dB (A);

c. Solid waste: mainly comprising wasted packaging materials, walnut shells and powder; and the wasted packaging materials are uniformly recovered by supply units, and walnut shells and powder are sent out as fuel.

5.3.1.2 Primary processing plant for walnut oil

The walnut shelling and processing workshop is located in the factory of Guizhou Hezhilin Food Beverage Company Limited in Yemachuan Town, Hezhang County, the company is dealing with environmental assessment procedures at present, and the project is only one of increased procedures.

(1) Technological process and pollution link: after the walnut kernels are processed and unshelled, a part of the walnut kernels is screened for squeezing oil, and the other part of the walnut kernels is directly sold after being packaged. The walnut kernels are cold-pressed and filtrated through a spiral oil squeezing machine, filtrated cakes are used for producing walnut milk, and crude oil enters a refining procedure.

The loan project only comprises a cold pressing system, a filling system and an auxiliary system, so that three procedures are elevated, and the environmental assessment of refining and refined filtration procedures are additionally evaluated by Guizhou Hezhilin Food Beverage Company Limited in Yemachuan Town, Hezhang County when the environmental assessment is developed by *New Processing Project of Annual Output of*

15,000,000kg of Walnut Oil and 20,000, 000kg of Walnut Powder in Hezhang County, Bijie City. The refining procedure of the project mainly comprises four contents of degumming, deacidifying, decoloring and deodorizing.

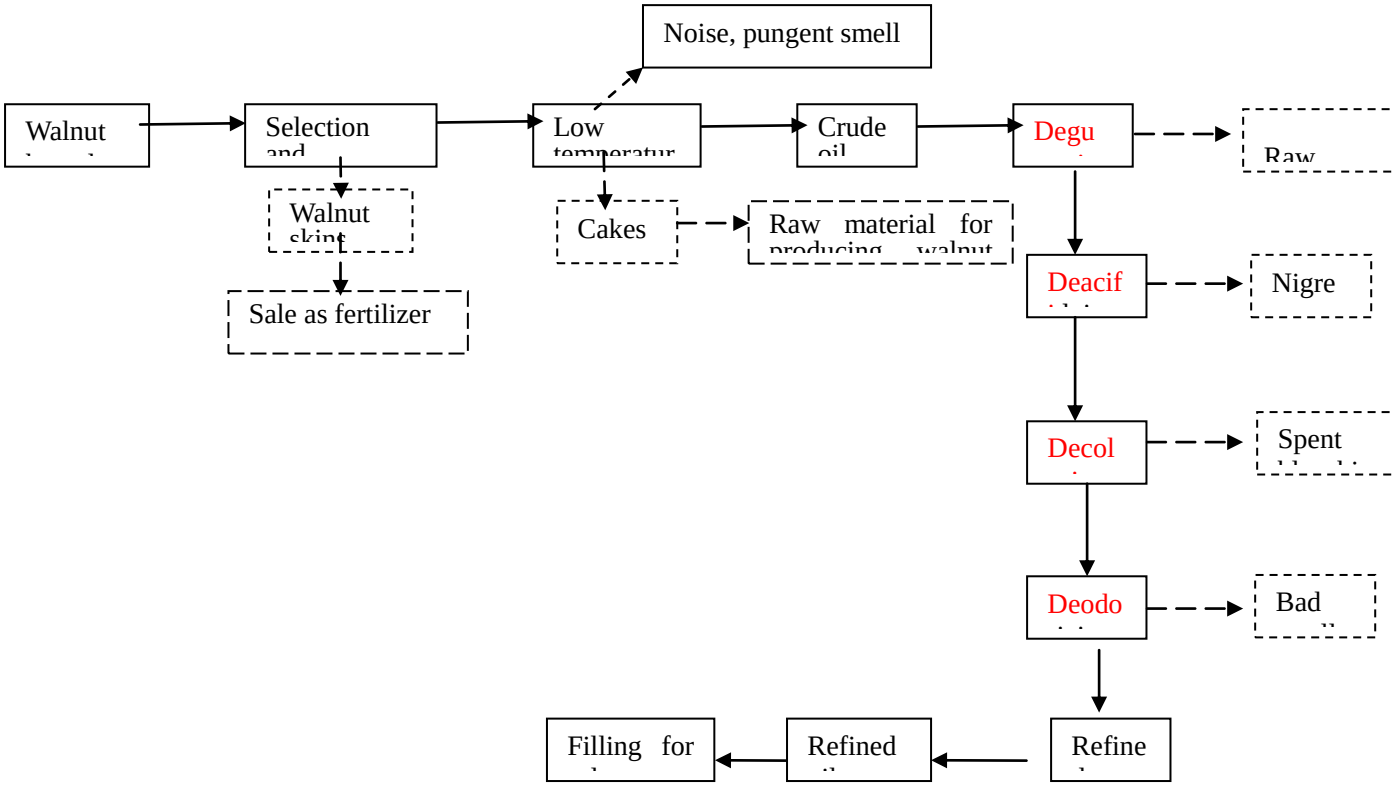


Figure 5.3.1-1 Production technology sketch map for walnut oil

a) Degumming: pumping the crude walnut oil into a hydrating boiler through an oil pump, heating the crude oil under stirring, adding hot water and non-iodized salt into the hydrating boiler, standing after heating and stirring, sinking raw phospholipide impurities into the bottom of the hydrating boiler, and draining into an oil foot tank below the hydrating boiler. The degummed oil is left in the boiler and enters the next deacidifying station.

b) Alkali refining and deacidifying, main reaction formula: RCOOH + NaOH → ROONa + H_2O

Pumping degummed oil into an alkali refining boiler, adding a caustic soda solution while stirring, standing after heating and stirring, sinking nigre at the bottom of the alkali refining boiler, and discharging to a nigre tank below the alkali refining boiler; and adding hot water into the deacidified oil for washing, so as to wash the remnant soap in the oil.

c) Vacuum drying: pumping the heated washed oil to a vacuum drier for drying.

d) Adsorption and decoloration: pumping the oil after being subjected to alkali refining into a decoloration tank, adding hargil, and heating and stirring; and then pumping oil into a filter to filtrate the wasted hargil adsorbed with impurities, so as to obtain decoiled oil.

e) Deodorization: pumping the heated decolored grease into a deodorization tower, so as to be in contact with superheated steam; pumping odour materials along with steam through a vacuum pump, condensing by a condenser, and exhausting noncondensable gas into atmosphere; and storing the deodorized oil discharged from the bottom of the tower in a refined oil product storage tank, and obtaining the refined oil product.

5.3.1.3 Walnut milk processing workshop in Yinjiang County

(1) Technological process and pollution link

Boiling water blanching: blanching walnut residues through boiling water (blanching for 20-30mins in the boiling water, so as to remove astringency)

Adding water and grinding into thick liquid: grinding the walnut residues while adding water, wherein the water addition is 6 times more than the walnut residues;

Filtration: enabling the walnut residues into a functional good workshop after the walnut residues are filtrated through a filter;

Burdening: weighing auxiliary materials of milk powder, cane sugar and the like according to the proportion of 8kg of walnut residues, 2.5kg of milk powder, 6kg of cane sugar, 0.02kg of vitamin C and 0.01kg of ethyl maltol, and uniformly mixing and switching into a burdening tank; and completely and uniformly mixing to adjust the pH value to be 6.8-7.2.

Emulsifying and homogenizing: emulsifying and homogenizing in a homogenizer, wherein the pressure is 180-220kg/cu.cm, and the grain fineness can reach up to below 2mm.

After the walnut residues are emulsified and homogenized, the walnut milk is obtained by UHT (Ultra High Temperature) sterilization, and the finished product of the sterilized and filled walnut milk is put into storage.

(2) Main pollution procedures during the operation period:

a. Waste water: waste water is mainly generated in a boiling water blanching station, wherein pollution factors comprise COD, BOD5, NH3-N.

b. Noise: generating noise when the water is added into a pulping machine, wherein the intensity of the noise source is about 70dB (A).

c. Solid waste: mainly comprising wasted packaging materials which are uniformly recovered by the supply units.

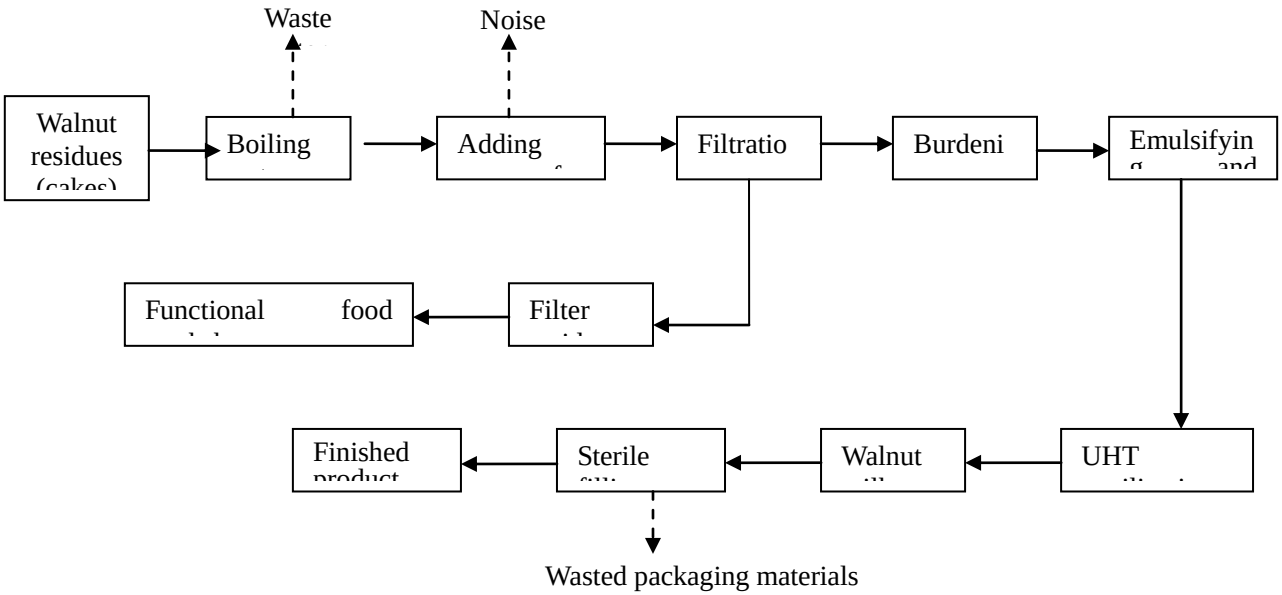


Figure 5.3.1-2 Production technique sketch map for walnut milk

5.3.1.4 Main environmental impact analysis on walnut serial operation periods

(1) Atmospheric environmental impact analysis

a. Powder generated by unshelling in a pretreatment workshop: a small quantity of powder is generated by the walnuts in the unshelling technology and is discharged in an unstructured way, aiming at the powder generated by the part, and the environmental assessment demands to set exhaust fans in the workshop and enhance ventilation. Due to the

smaller project scale and lower powder discharge, after the above measures are adopted, the concentration of the powder in the field can meet the unorganized emission standard in a table 2 in *The Integrated Emission Standard of Air Pollutants* (GB16297-1996).

b. Irritant gas generated in the oil squeezing workshop: the infusion technology of the project is carried out in a sealed space, a solvent comprises the main ingredients of n-hexane and cyclohexane; the solvent is provided with volatility and stronger pungent smell, if the content of an organic solvent in environmental air can be lifted if leakage is happened, so as to pollute environment and influence the body health of workers. The environmental assessment demands to enhance the daily management and maintenance of production equipments, keep the safety operation of apparatuses, such as an extractor, a solvent holding tank and the like, prevent the solvent gas from overflowing, and guarantee commodity processing and the physical and psychological health of the workers.

c. Deodorized exhaust gas

Distillate generated in the deodorizing process mainly comprises a light fraction in grease, 99% of distillate can be recovered by a condensing recoverer, and noncondensing fractions enter a cooling tower along with the steam and then are discharged into atmosphere.

d. Stench in production line

The stench in the project is mainly from the oil foot tank, spent bleaching clay field and the like.

The measures intended to adopt by enterprises mainly comprise periodically clearing the oil feet in the oil foot tank and spent bleaching clay in the spent bleaching clay field, so as to prevent the stench caused by the growth of bacteria due to the long-term storage of the above articles; and strengthening production management, and preventing the "escape, emission, dripping and draining" of the oil in the production.

(2) Water environmental impact analysis: the production waste water in the walnut processing series mainly comprises wasted walnut milk, and oily wastewater infused by the walnut production. The pollution factors of the production waste water generated by the boiling water blanching procedure in a walnut milk processing workshop comprise COD, BOD5 and NH3-N. According to the pollution discharging coefficients in the 1534 milky beverage and plant protein beverage manufacturing industry (Table 1) of *The Pollution Discharging Coefficient of Chemical and Industry Pollution Source Census of The First National Census on Pollution Sources*, the COD is 777mg/L, the BOD5 is 375mg/L, and the NH3-N is 25mg/L; a small quantity of waste water is generated in an infusion procedure, after solvent gas and mixed gas are condensed in the infusion procedure, and the solvent is recovered, and the rest of organic waste water is drained by a water tank; the waste water generically contains cake crumbs, the concentrations of the main pollution factors of the oily waste water infused in the oil squeezing station are as follows: the COD is 750mg/L, the BOD5 is 375mg/L, the SS is 250mg/L and the plant oil is 200mg/L. The residual nigre and impurities in the oil are washed in the alkali refining waste water after the alkali refining. The residual nigre and impurities are intermittently generated, and mainly contain oil, fatty acid salt, suspended solids and the like, the COD concentration is higher, and the oil content is high.

The steam generated by the vacuum drier enters the condenser, and the condensed waste water mainly comprises grease. The steam containing ordor materials in the deodorization tower enters the condenser, and the condensation waste water mainly contains grease. The waste water is suggested to be preprocessed by anaerobic biological treatment, such as anaerobic acidification, so as to reduce the COD content, improve the biodegradability of the waste water, and further provide a basis for the further treatment. The waste water shall be recycled to the greater extent, receiving water, which cannot be used and shall be drained

into corresponding water function on standard, and shall be severely forbidden to be directly externally drained.

(3) Acoustic environmental impact analysis: the project is mainly generated by the production equipment, the noise intensity is not high, the main noise sources comprise the unshelling machine, a crushing machine, a water pump and the like, and the noise level is between 75 and 85 dB (A). In order to reduce the impact of the noise on the environment, the environmental assessment demands to enhance factory district greening, purchase equipments with low noise, and adopt the measures of sound insulation, noise elimination, sound absorption, vibration isolation and the like.

(4) Environmental impact analysis on solid waste: the solid waste of the project mainly comprises shells, silt, oil foots, walnut shells and the like. The walnut shells in the project generating process is sent out as the fuel, and the wasted packaging materials are uniformly recovered by the supply units; and raw material impurities are food raw materials, belong to non-toxic harmless solid waste, and can be disposed with domestic garbage after the raw material impurities are collected.

5.3.2 Fodder and organic fertilizer processing

A laying hen fodder processing workshop and an organic fertilizer processing workshop are respectively located in Shiqian County and Weining County. In addition, the processing of a goat industry fodder workshop in Yanhe County is similar to the processing of chicken fodder in Shiqian County. Therefore, in the case of the goat industry fodder workshop, the environmental impact is analyzed, and the specific construction contents and specifications are seen in the table 2.3-1 in the report.

5.3.2.1 Fodder processing

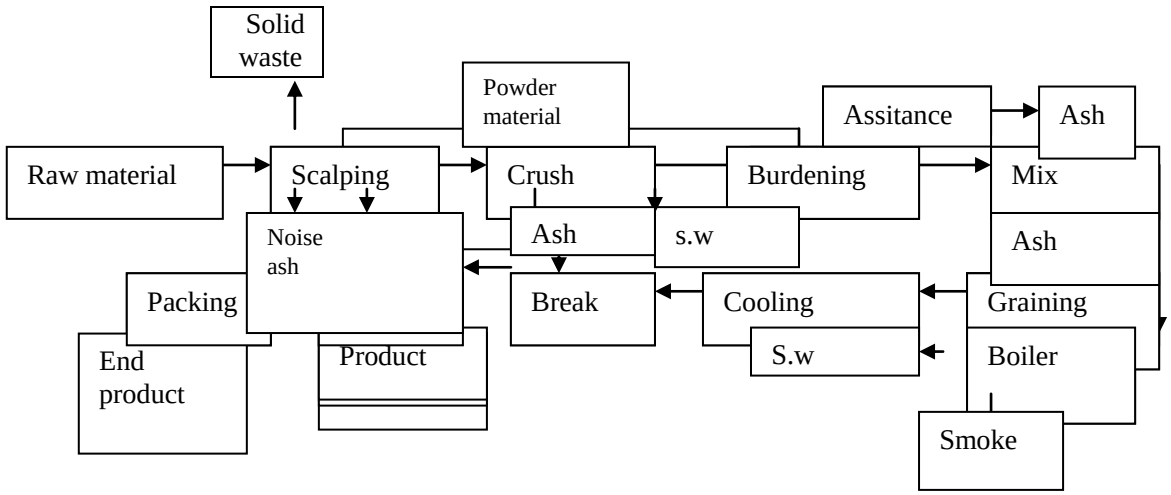


Figure 5.3.2-1 Fodder processing technology and po link

5.3.2.2 Organic fertilizer processing

The organic fertilizer processing workshop is located in the laying hen cultivation base of Huaxi Group Weining Haixing Ecological Animal Husbandry Co., Ltd. in Caohai Town, Weining County, and the company is dealing with the environmental assessment procedures of the whole cultivation base at present.

(1) Brief description of the process

Premixing: mixing the chicken manure, straws and saw dust according to a certain ratio, so as to enable the organic fertilizer to meet the fermentation conditions of moisture, carbon nitrogen ratio and the like, and adjust the fertilizer efficiency of the organic fertilizer.

Aerobic fermentation: the chicken manure is aerobic fermentation, but a part of area is conducted for anaerobic fermentation due to under-inflation, but no process wastewater is generated. The chicken manure is premixed and then fermented in a fermenting tank, is gradually heated up under the function of biological strains, and fermented at about 60-70 DEG C for more than 10 days, so that harmful viruses, pathogenic bacteria, plant diseases and insect pests and weed seeds in the chicken manure can be effectively removed after the fermentation.

Adjusting carbon nitrogen ratio: the fermented organic fertilizer is needed to adjust the carbon nitrogen ratio by mainly adding 14% of bentonite, 12% of potassium chloride, 9% of ammonia phosphate, 14% of ammonia sulfate and 1% of microelements into the organic fertilizer to turn and stir, and then feeding into a rotor drum granulator to granulate, and the rest of products are not needed to adjust carbon nitrogen ratio and is conducted for rotor drum granulation.

Rotor drum granulation: feeding the adjusted organic fertilizer to granulate in the granulator, preparing the organic fertilizer into granulated fertilizer with the diameter of 4mm by the granulator, raising the temperature of the organic fertilizer in a granulating process, and cooling the granulated fertilizer gotten out of the granulator.

Cooling: cooling the granulated fertilizer by an air cooling way, feeding materials into a counter-current cooler through a conveyor belt, air cooling through centrifugal ventilation, and reducing the moisture content in the organic fertilizer in a cooling process.

Enveloping: enveloping by mainly spraying a water solution containing urea on the particles of the organic fertilizer, so as to improve the fertilizer efficiency of the organic fertilizer, and simultaneously play a role in protecting the organic fertilizer.

Organic fertilizer processing pollution link are seen in figure 5.3.2-2.

(2) Main raw and auxiliary material consumption

Table 5.3.2-2 List of main raw and auxiliary material consumption

No.	Raw material name	Unit	Annual consumption
1	Chicken manure	t/a	12.5
2	Straws	t/a	0.75
3	Saw dust	t/a	0.75
4	Bentonite	t/a	2800
5	Potassium chloride	t/a	2400
6	Potassium phosphate	t/a	1800
7	Ammonium sulfate	t/a	2800
8	Other microelements	t/a	200

5.3.2.3 Main environmental impact analysis on fodder and organic fertilizer series

(1) Atmospheric environmental impact analysis

a. Feed processing project

More powder generating positions in the fodder project, almost involve each production technology.

An opposite pulsed jet cloth filter shall be separately set to govern cooling air, the collection efficiency is 99%, and the treated waste gas is exhausted on standard through a 15m high exhaust cylinder.

The powder generated by crushing and screening the cooled finished product mainly comprises raw material powder. The powder is leaded to be treated by the dust remover of a cooling system, so that the waste gas is exhausted on standard.

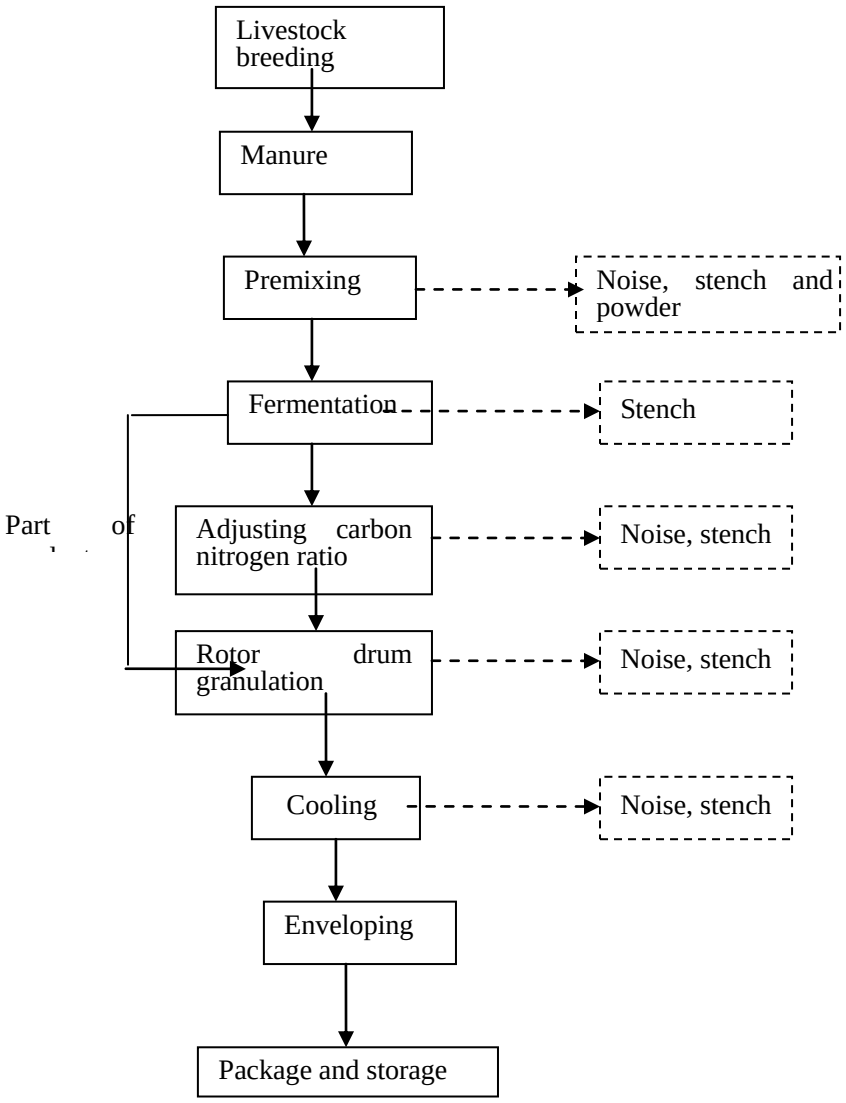


Figure 5.3.2-2 Organic fertilizer processing and pollution link

b. Organic fertilizer processing project

From the front analysis, foul gas is generated in a premixing chamber, a fermentation chamber and a finished product storage chamber in an organic fertilizer production process and foul gas treatment measures shall be designed.

The environmental assessment project needs to set deodorization measures. The project is suggested to set draught fans in the workshop, the foul gas is leaded to an adsorption device provided with active carbons through the draught fans and is removed by an active carbon adsorption method, and then is exhausted through the main exhaust port of the workshop. Due to the complicate surrounding terrain, the environmental assessment demands that the exhaust cylinder is not lower than the 25m high exhaust cylinder.

A small quantity of unstructured exhausted foul gas in the production process is escaped in the air around the workshop, and a small quantity of foul gas is escaped when workers get in and out the workshop in the process of operating. The escape is unavoidable, and the unstructured exhausted foul gas is demanded to adopt certain measures to reduce the unstructured exhausted escape to be lowest by the enterprise; the specific measures are as follows: cleaning the chicken manure scattered in the workshop in time; periodically spraying deodorants, such as calcium superphosphate, peroxyacetic acid and the like in the workshop, spraying once everyday, determining the spraying amount as appropriate;

covering the chicken manure in the transporting process, preventing the chicken manure in a transporting process, and simultaneously spraying the deodorants, such as calcium superphosphate, peroxyacetic acid and the like on the surface of the chicken manure, so as to reduce the emission of the foul gas in the transporting process.

(2) Environmental impact analysis on water

a. Fodder processing project

The water for production in the product is mainly water for a boiler room. Electricity is adopted by the boiler, so that no desulfurated dedusting water is generated.

The staffs of the project are completely local villagers. The collected domestic water can be used for afforesting and watering dust prevention within site after being treated by a digestion tank everyday, and is not externally drained.

Therefore, the water environment is essentially not influenced by the completed project.

b. Organic fertilizer processing project

From the engineering analysis, after the project is completed, waste water for the sanitation of the mill floor is generated, and raw materials are simpler in the production process, and no pollutant, such as the organic solvent, is generated. Therefore, the waste water for the sanitation of the mill floor mainly comprises pollutants SS, and the waste water is used for dust fall in the plant area after being simply precipitated.

The domestic sewage is treated ditto.

(3) Acoustic environmental impact analysis

The noise source of the project mainly comes from a boiler fan, a classifying screen, an air compressor, a precleaner, a crusher, a mixing machine and the like, and the sound power level of the noise is between 80-150dB (A). Various mechanical equipments are fully arranged indoors, the assessment demands to select the equipments with low noise, and vibration attenuation bases are arranged at the bottom of the equipments, the boundary noise is predicted to reach the standard of the second area in GB12348-2008 after factory sound insulation and natural attenuation.

(4) Environmental impact analysis on solid waste

a. Fodder processing project

The solid waste generated in the project operating process mainly comes from two aspects: firstly, the earth generated in a primary raw material washing process shall be uniformly sent to places for landfill authorized by the environmental sanitation department; and secondly, the household garbage discharged in the daily living process of the staffs shall be intensively stacked, timely cleaned everyday, and sent to garbage dump designated by the environmental sanitation department. The treated solid waste generated in the operating period has very small impact on the environment.

b. Organic fertilizer processing project

The household garbage discharged in the daily living process of the staffs shall be intensively stacked, timely cleaned everyday, and sent to the garbage dump designated by the environmental sanitation department. The treated solid waste generated in the operating period has very small impact on the environment.

5.3.3. Primary processing workshop for tea leaf

Primary processing workshop for tea leaf is located in Zheng'an County and Nayong County, the projects are the purchasing for all green tea processing units, specific construction content and scale are as shown in this report table 2.3-1 specifically.

5.3.3.1. Primary processing flow and pollutant production link analysis for tea leaf

(1) Workflow brief introduction

Killing out: it is a tea making step that oxidase activity in fresh tea leaf is destroyed and inactivated, tea polyphenol and the like in the fresh leaf are inhibited, partial moisture in

the fresh leaf is evaporated to soften the tea leaf, which is convenient for rolling and shaping, at the same time, for sending out green taste, and promoting the formation of great aroma.

Rolling: it is a molding process for teat first manufacturing, forms its tight and firm outline through rolling for shaping, and also influences the improvement of interior issue. Under the action of external force, lamina is rolled into breaking and lightened, turned into strips, the volume is diminished, which is convenient for brewing. At the same time, partial tea juice is squeezed overflowing to be attached to the surface of the leaf, which plays an important role to improve the taste and concentration of the tea. The rolling process is divided into cold rolling and hot rolling. So-called cold rolling, namely, is the rolling after the killing-out leaf is cooled, the hot rolling is the rolling while the tea leaf is hot instead of killing-out. Cold rolling is suitable for tender leaf to keep yellow green and bright liquor color below the light green leaf, and hot rolling is suitable for old leaf in order to tighten the strips, thus to reduce the scraps.

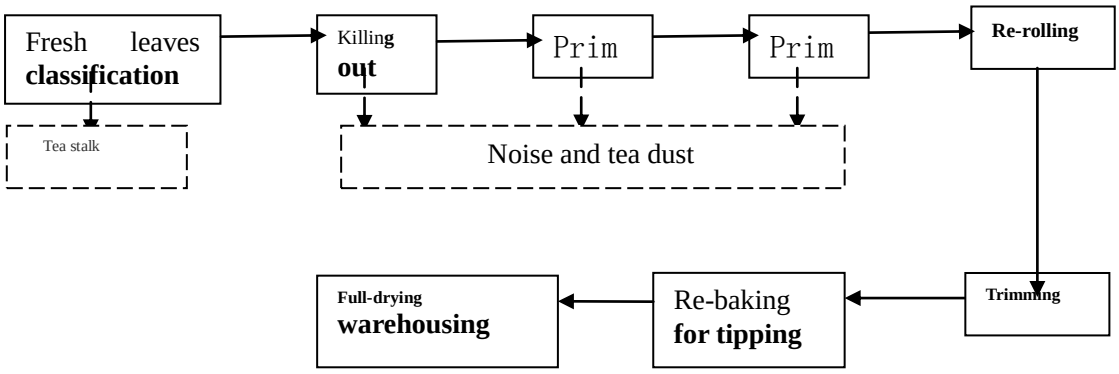


Figure 5.3.3-1 Sketch Map for Tea Manufacturing Technique

Drying: the purpose of the drying is to evaporate water, trim appearance, and to give full play to tea perfume. There are three types of baking, roasting and drying in the sun. The drying procedures generally comprise baking firstly, and then roasting. As the water content of the tea leaf after being rolled is still relatively high, it forms block mass quickly if directly roasted, and the tea juice is prone to bond the pot wall. Therefore, tea should be baked firstly to enable water content dropping to the requirements of pan frying.

5.3.3.2. Major environmental impact analysis

(1) Waste water impact analysis

During the production process of the project, the water for fermentation used in the tea fermentation stage is dried for evaporation in the follow-up process of natural withering and does not produce fermentation wastewater.

Employees of this project are all local villagers, the daily domestic water and waste water can be used for greening and watering dust prevention instead of discharging externally after being processed by septic-tank and collected.

(2) Exhaust gas impact analysis: the waste gas produced by the product is mainly tea dust produced during the process of the production, the tea dust is collected by dust collecting units, having less environmental influence externally.

(3) Noise impact analysis: the noise pollution source of the project is generated by the mechanical equipment during the process of production, all equipments are placed into workshops, according to the analogy analysis, the sound source intensity is between 70 to 85 db (A).Counted by a principle that the noise decreases with the increasing of the spreading distance (at least two walls are needed, based on that the weighted transmission loss of the plant wall is 10dB (A)), it can be estimated that noise with 16m around the plant is 51dB (A), being not more than 60dB (A) which reaches the standard, and does not greatly

influence environment externally. Moreover, the production of the plant is performed in the daytime, which is free from the environmental noise sensitive spot. Therefore, the noise basically has no influence on ambient environment.

(4) Solid waste impact analysis: the solid wastes of the project are mainly tea dust, tea stalk, tea grounds, discarded package during the process of production, and household garbage produced from life. The tea dust is recycled after being collected and packaged. And the tea dust, tea stalk, tea grounds, discarded package and household garbage are collected and processed regularly by local environmental sanitation station after being uniformly collected. After being duly handled, the solid waste causes less influence on environment.

5.3.4. Nuo Gu pig slaughter house

Slaughter house is located in Nayong County, 1300m^2 of slaughtering and freezing workshops, 1000 m^2 of slaughterhouse ground hardening, 200m^2 of to-be-slaughtered room, 200m^2 of slaughtering workshop, 200m^2 of acid discharge workshop, 300m^2 of cutting workshop, 400m^2 of frozen workshop, 400m^2 of reservoir, 400m^2 of sewage treatment facility for grade level cleaning, one set of slaughtering machinery, one set of cutting device, and one set of refrigeration system are set up for the project, specific construction content and scale are as shown in this report sheet 2.3-1.

5.3.4.1. Flow and pollutant production link analysis for slaughter house

(1) Brief description of the process

After live pig is put into factory, the key links thereof are as follows:

① To be slaughtered: the appearance of the to-be-slaughtered pig sent by farmer is checked to confirm that it is healthy and well, before butchering, the to-be-slaughtered pig is not given food for convalescing 12 to 24h, during the process, pig will let off fecaluria giving off foul smell.

② Drip washing before butchering: to spray the to-be-slaughtered pig clean, dust, sludge and fecaluria are not allowed on the surface of the pig body, this process produces flushing waste water.

③ Bloodletting via electricity shock

Voltage and electric shock time are adjusted properly according to the variety of live pig and slaughter season.

④ Hair scalding and roughening

Pig carcasses after bloodletting are carried out the following processes of hair scalding via hot water, bloodiness, butts and other dirt, pig hair is collected for external sell, and this process produces flushing waste water.

⑤ Heart opening and side opening

⑥ Carcass washing: After evisceration, fresh water with enough pressure is used for cleaning the chest cavity and abdominal cavity so as to wash intracavity extravasated blood, float hair, dirt in and both sides of adrenal glands are extirpated. Inspection and quarantine is also needed for checking whether there is tissue with lesion.

⑦ Viscera washing: Each viscus taken out through dressed process is cleaned, and inspection and quarantine is also needed for checking whether there is tissue with lesion. This process produces flushing waste water and possibly produces viscera with lesion.

⑧ Special working procedure: It mainly refers to the treatment of sick (dead) pig which occasionally appear in transportational process (especially in summer), this part of pigs should be isolated firstly, and inspected by Animal inspection agency，if it is not edible after testing, the whole pig is performed an innocent treatment, otherwise, slaughter is carried out directly skipping the processes of food stopping and convalescing, and the edible parts are processed.

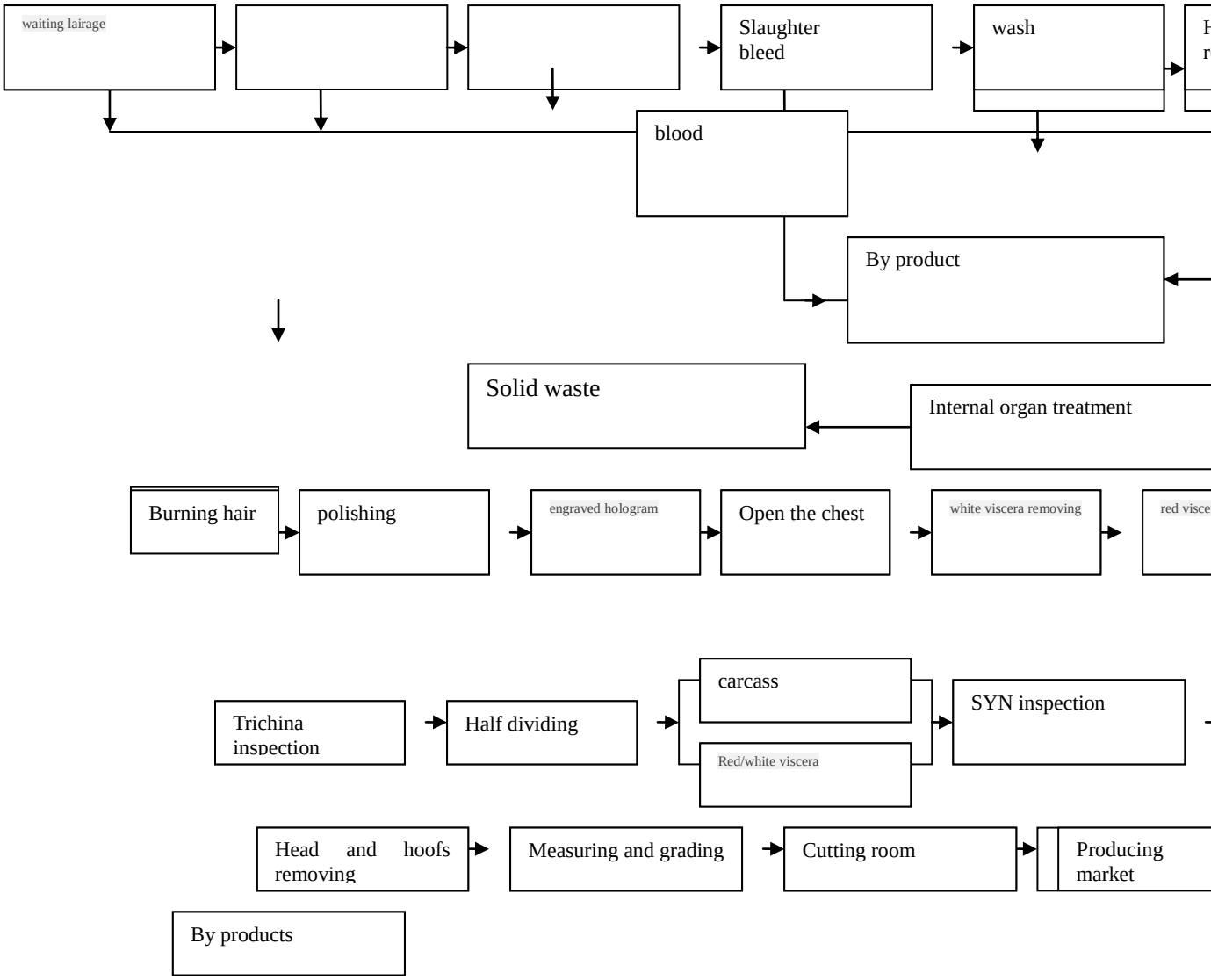


Figure 5.3.4-1 Flow and Pollutant Production Link Analysis for Slaughter House

(2) Main pollution procedures

① Waste water:

According to the pollution flow chart of production technology, slaughtering workshop is mainly divided into three stages: slaughter section, visceral processing section, dissolution processing, and washing section. Wastewater quantity discharged by the slaughter section is maximum, taking up about 50% of the wastewater quantity of the factory production, waste water contains a little blood and protein (vertical bloodletting, blood sampling, bloodletting by puncture do not consume water, and there is no blood in the waste water), waste water in the workshop section of the visceral processing mainly comprises undigested objects in stomach and intestine, as well as excreta (this kind of wastes are collected by sanitation department, and used as agricultural fertilizer after being piled up for fermentation instead of entering into waste water), but a large number of water is also needed for washing. Therefore, the waste water of this section contains more suspended solids (mainly composed of fibrous matter), also comprises a little of silt matters, the dissolution processing and washing section are the last processes of the slaughtering workshop, the discharged waste water comprises bloodiness, animal fat, ground meat and the like, the color of the waste water is darker.

② Waste gas: It is mainly the foul smell, stench produced in slaughter process, the stink produced by the gastrointestinal contents fermentation and waste water treatment

station, which will bring adverse effect on environment.

③ Noise: The noise pollution source of the project mainly comprises noises produced by an air compressor, a water supply pump house, a pump house in the waste water treatment station, and blower room, traffic noise, the croaking of the animal in the to-be-slaughtered hog lot and the like.

④ Solid wastes

Solid wastes of the project are mainly from gastrointestinal contents produced in the process of slaughtering process and household garbage of staff.

Production waste: it is mainly the discharged gastrointestinal contents of the project yearly, secondly, the sludge produced during the sewage treatment link of the factory, and sick pigs appearing during the process of to-be-slaughtered live pig quarantine.

5.3.4.2. Main environmental impact analysis in operational period

(1) Waste water impact analysis

Externally-discharged waste water of the project comprises industrial wastewater and domestic sewage, the discharge capacity of the domestic sewage is relatively less capable of being mixed into the industrial wastewater for centralized processing. Industrial wastewater includes animal manure flushing water discharged by the to-be-butchered fence, ground flushing water with bloodiness and animal manure discharged by the slaughter workshop, as well as the high temperature water with a large number of pig hair discharged during the process of hair scalding.

General condition of the pollutants in externally-discharged waste water is as follows: pH: 6.5 to 8.5, CODcr: 1500mg/L, SS: 900 mg/L, NH3-N: 50 mg/L, BOD5, 800mg/L. The direct discharge of the waste water cannot reach the first level standard value specified in table 3 of *Pollution Discharge Standard on Meat-Packing Industrial Water* (GB13457-92). Currently, the design does not involve in sewage treatment, this environmental impact assessment suggests that a kind of 'grille pool + 'regulating reservoir' + 'hydrolysis pool' + 'biological contact oxidation pond' + 'settling pond' buried sewage treatment facility.

Brief introduction on treatment process: the integrated waste water automatically flows into the regulating reservoir for regulating water content and homogenizing water quality after being performed with massive impurities removal via the septic-tank firstly, and then through the grille, it is measured and pumped into a facultative pond by a water pump for aerobic/anaerobic treatment, no biodegradable macromolecular organic matters in the sewage water are translated into easily-degradable low molecular weight organic matters, and the insoluble organic matters are translated into dissolved organic matters via using the hydrolysis and acid production effects of facultative bacteria, which improves the biodegradability of waste water. Effluent automatically flows into the biological contact oxidation pond for aerobic biochemical treatment, the biological stuffing in the biological contact oxidation pond adheres to a large number of aerobic bacteria which resolves the organic matter in the waste water into inorganic substance under the condition of full aeration. The effluent in the oxidation pond backflows into the facultative pond for denitrification process, the reflux ratio is 1: 2, the rest effluents automatically flows into the settling pond for materialization action added with flocculant at the same time, thus to realize solid-liquid separation, the effluent automatically flows into a clean water basin, the treating water is discharged externally after being up to standard or used for greening and the like.

(2) Exhaust gas impact analysis

The stench of the project mainly comes from the to-be-slaughtered hog lot and slaughtering processing workshop, the major foul gas is ammonia, H2S and the like which will spread to the whole factory and the surrounding regions if any measure is not taken. The stench of the project mainly comes from the slaughtering processing workshop and the

piling-fermentation of the gastrointestinal contents. According to the similar engineering survey, the concentration of the foul gas produced by the slaughtering processing workshop is relatively lower, the piling-fermentation of the gastrointestinal contents and the sewage settling tank produce foul smell, but the gastrointestinal contents are outward transported at weekly intervals, the sewage settling tank is covered. Field observation of similar project shows that certain foul smell exists in the factory, but it is not smelled near factory boundary. The foul smell is the main factor that proposed project influences external environment, in order to ease the adverse effect of the foul smell on external environment, at the same time to void the harm on operating workers and livestock caused by the excessive accumulation of poisonous foul gas, the project is proposed to takes measures (see EMP):

①5 to 10m of greening isolation belt, the influences of the foul gas on external environment should be reduced as far as possible;

②The project should timely clean the excrement of animals, gastric content, ground meat, bone crusher and other wastes in the to-be-slaughtered hog lot, and slaughtering workshop;

③As the density of the live pig in to-be-slaughtered hog lot is relatively high, ventilation times should be appropriately increased to remove the foul gas.

④Ventilation times should be increased in the process of viscera taking via laparotomy in the slaughtering workshop to remove the foul gas.

⑤The ground of the slaughtering workshop and to-be-slaughtered hog lot for the project, the ground should be paved with blood resistant, waterproof and mechanical failure resistant impermeable materials, the surface should be skid resistant;

⑥The ground of the slaughtering workshop and to-be-slaughtered hog lot should be designed a certain slope, being 1.5% to 3% generally, and a drain is designed, iron perforated strainer is paved thereon so as to clean the ground and drainage;

⑦Deodorant is installed in the exhaust system;

⑧If the foul smell still influences the surrounding residents after the above measures are taken, for the fugitive-emission foul gas difficult to be collected, it is suggested that with a Canadian biochemical deodorization technology, the natural extractive is sprayed in an atomization way to react with the H_2S, NH_3, amine and other foul gases dispersing into the air, thus to achieve the aim of deodorization.

After the project adopts the above environmental protection measures, the odor intensity level in workshop and to-be-slaughtered hog lot is reduced to 1 to 2 level, which greatly reduces the influences on ambient environment.

(3) Noise impact analysis

The noise sources of the project equipment mainly comprises noises produced by an air compressor, a water supply pump house, a pump house in the waste water treatment station, and blower room, traffic noise, the croaking of the animal in the to-be-slaughtered hog lot and the like, the noise value is 80 to 95 db (A), the proposed noise control measures are as follows: each noise equipment is equipped with vibration attenuation foundation, and for the equipment with high noise, an independent workshop is needed;

Considering from the model selection and procurement of project equipment, complete set with low noise should be selected as far as possible, the factory layout should be arranged rationally, the main noise equipments should be arranged on the places relatively far away from the factory boundary as far as possible to reduce the noise from the transmission distance;

Daily maintenance and repairing of the equipment are strengthened to avoid the noise increasing while the remote operation of the equipment is abnormal, in order to reduce the influences of the livestock croaking on operating workers and the surroundings, it is

suggested that the roof and walls of the to-be-slaughtered hog lot for the project are equipped with sound absorption materials, at the same time, the interference of the outside noise on the to-be-slaughtered hog lot should be reduced, stable and peaceful atmosphere should be maintained, thus to ease the tension of animals, staff should wear ear plug and other labor protection appliances, and the factory district greening should be strengthened, taller broadleaf trees are planted around the factory to beautify environment, and reduce noise.

(4) Solid waste impact analysis

For the gastrointestinal contents and solid wastes produced in the process of the slaughter processing for the project, how to deal with it is not mentioned in the feasibility study. This environmental impact assessment suggests that it should be regularly (about once per half a year) shipped out of the factory after being fermented, and buried as fertilizer by local farmers. The solid wastes of the project can accord with the Town Refuse Farm-Oriented Control Standard after being fermented, it is transported outward for full use by the local farmers, which will not cause adverse effect on external environment obviously. The solid wastes will produce pungent odor while fermenting, having large influence on the external environment, which must be paid great attention, and effective measures should be taken to ease the influences of the foul smell on the external environment as far as possible.

In addition, pig hair produced in the process of slaughtering can be sold to a recycling company for unified processing, as the healthy live pig is tired on passage, after being shipped to the to-be-slaughtered shed, it is possible to appear sick pig, the occurrence probability is rarely, but it is suggested to uniformly deal with the sick pig occurring in the quarantine of the to-be-slaughtered shed via negotiating with the sanitation and antiepidemic station, solid wastes piled in the septic tank should be shipped outwards regularly to reduce the emission of the foul gas, a closed container truck should be used for shipping outwards the solid waste, thus to prevent its leakage during the process of transportation.

For the staff household garbage, a garbage can should be established in the factory, it is processed uniformly by sanitation department after being collected in a centralized way, and arbitrarily stacking or burning is not allowed. Solid wastes are properly processed in time, which influences the surroundings less.

5.3.5 Primary processing of traditional Chinese medicinal materials and konjak

Traditional Chinese medicinal materials processing: slicing kudzuvine root and platycodon grandiflorum, powder processing and packaging. The konjak processing of the project is similar to the traditional Chinese medicinal materials processing, so that the konjak and the traditional Chinese medicinal materials are analyzed together. Specific construction contents and scales are seen in the table 2.3-1 of the report.

The project is the traditional Chinese medicinal materials processing which focuses on washing, slicing, drying, crushing, sterilizing and packaging. The brief of technical flow is as follows:

Storing and categorizing the purchased traditional Chinese medicinal materials in a raw material warehouse to maintain the quality of the traditional Chinese medicinal materials, and then taking out a part of the traditional Chinese medicinal materials in the warehouse to select and settle, removing wrong traditional Chinese medicinal materials or the traditional Chinese medicinal materials which are below the required, and settling and forming the selected traditional Chinese medicinal materials; washing the settled traditional Chinese medicinal materials in a washing machine so as to remove soil and impurities, slicing the traditional Chinese medicinal materials which reach slicing requirements, completely slicing the traditional Chinese medicinal materials into small tablets, preparing into medicinal slices, and drying by a dryer, crushing the traditional Chinese medicinal materials which are inapplicable to slicing, and performing dryer drying, autoclaving and packaging on the

powdered traditional Chinese medicinal materials.

Main environmental impact analysis

(1) Waste water environmental impact analysis: the project is located in the county industry zone, but the industrial wastewater of the project mainly comprises medicinal materials washing waste water, waste water for washing mechanical equipments and condensate water for sterilizing, wherein the amount of the condensate water is precious little, and essentially has no influence on an external environment, and the industrial wastewater is not externally drained and is recycled.

(2) Atmospheric environmental impact analysis

A certain amount of powder is generated in the process of crushing, sieving and packaging the medicinal materials, but the mechanical equipments of the processes are closed equipments, and the dust capacity is low after the powder is processed by a bag-type dust collector, so that the influence on the external environmental is lower.

Sterilization equipment is closed equipment, and little water vapor is overflown in the process of taking out the sterilized medicinal materials and is discharged in an inorganization way, so that the external environment is not essentially influenced.

(3) Acoustic environmental impact analysis: the measures of noise reduction and denoising are designed on the equipments with noise; if rubber anti-vibration pads are arranged based on the processing equipment, sound-proof devices are arranged on the motor of the processing equipment and the like; after the above measures are adopted, through the analogy of the similar enterprises, the overlapped sound level of sound source does not exceed 84dB (A); on the overall arrangement, the production equipment is arranged to be far away from a sensitive area, and double-layer sound control glass is arranged, so as to reduce the influence of the noise on the environment. The decrement of the factory is 15dB (A), and the double-layer sound control glass is 8 dB (A). After the above measures are adopted, the project factory can meet the limit value requirements during the daytime and at night.

(4) Solid waste environmental impact analysis

The articles in a project operating process mainly comprise medicinal material chips, raw material packing materials, household garbage and the like.

The medicinal material chips in the project producing process are recycled to the greatest extent, and the medicinal material chips which cannot be recycled are uniformly processed by the sanitation department. The household garbage is non-toxic and harmless wastes, is periodically collected and processed by the local sanitation station after the household garbage is uniformly collected in the factory.

5.3.6 Ramie processing project

An embroidery artware processing and producing factory, which is 1,000 m^2, is built in Longchang Town, Nayong County; and 400 sets of handlooms, which are purchased and produced, are placed in Guizhou Fulin Ethnic Culture Tourism Development Co., Ltd. The ramie processing mainly focuses on manual weaving and hand embroidery, so that the environmental influence in the process of operating is less.

Local peasant households perform the pollutants generation processes of degreasing by calcined lime, coloring and the like after the ramie is harvested, according to the feasibility provided by the owner. The project investment does not include the processes, but the processes belong to related activities, and have larger influence on the local environment, so that the environmental influence analysis is performed.

5.3.6.1 Analysis for primary process flow and pollutants generation link of ramie processing project

(1) Brief of technological process: the ramie processing processes comprise 12 manual processes of ramie soaking, ramie stripping, rinsing and degumming, (sunshining in the day

time and dewing at night) ramie twisting, forming threads by warps, twisting and rolling, ramie combing and pulping, spinning, bleaching, dewatering, printing and dyeing, drying and shaping, forming finished products, packaging and the like.

(2) Main pollutants generation processes during the operating period: the pollutants generated in the specific treatment are seen in the figure 5.3.6-1.

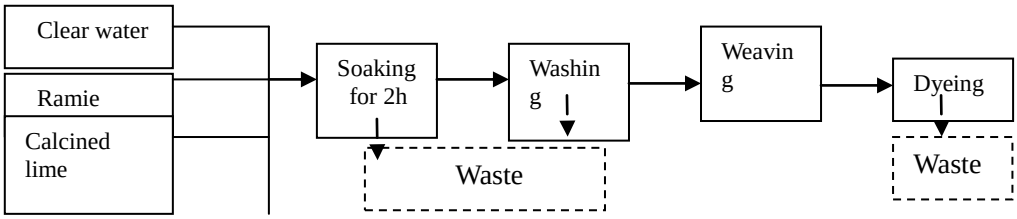


Figure 5.3.6-1 Ramie processing technological process and pollutants generation flow diagram

5.3.6.2 Main environmental impact analysis during the operating period

The main environmental impact of the project is the impact of the industrial wastewater on the water environment. Soaking, washing and printing and dyeing are individually operated by the local villagers, and the main pollution comprises soaking waste water and dyeing waste water, wherein the soaking waste water is limewater, the dyeing waste water mainly contains some dyes, and the printing and dyeing waste waster contains a plurality of organic pollutants and is high in concentration. The environment is polluted by arbitrarily draining the soaking waste water and the dyeing waste water, the dyeing waste waster contains a plurality of organic pollutants and is high in concentration, and the varieties of the dyes are changed and a plurality of chemical slurry is used, so that the wastewater contains biodegradable organic matters. If the sewage is directly drained into receiving water without effective treatment, the ecological balance of the water environment can be severely damaged, and the body health of human beings can be directly threaten. The industrial waste water of the project is fully recycled after the sedimentation treatment and is not externally drained, so that the pollution on the environment can be alleviated.

For the pollution caused by the individual operation is difficultly controlled, and the management is difficultly implemented, the environmental assessment is suggested that workshops are fully integrated in the park, concentrated production and management and unified management are realized, and sewage treatment facilities are uniformly constructed, so that the impact on the environment can be alleviated. Private investors are forbidden to process the ramie.

5.4 Resources’ carrying capacity analysis

5.4.1 Total water resources and spatial and temporal distribution for project location

According to the statistical data of all counties of the project area in 2012, the engineering water retention capacity in the project counties is 140, 444, 414m^3, and the engineering water retention capacity in the project districts is 213, 061, 27m^3. By reference to the standard of *Guizhou Water Province Industry Water-use Quota (DB52/T 725-2011)*, the water consumption norms for agriculture, forestry and animal husbandry are as follows:

Table 5.4.1-1 Guizhou province agricultural irrigation partition

Agricultural irrigation partition	**Warm heavy summer rid region of east Guizhou (II)**	**Warm middle summer rid region of north Guizhou (III)**	**Warm and cool heavy summer rid region of northwest Guizhou (IV)**
Project locations	Tongren	Zunyi	Bijie

Table 5.4.1-2 Guizhou province agricultural water quato

Category name	**Quota unit**	**Irrigation partition**	**Irrigation way**	**Net irrigation norm**

Potatoes		m3/mu	Provincial synthesis	Tube-well irrigation (watering)	40
Forage grass		m3/mu	Provincial synthesis	Spray irrigation	70
Vegetable in greenhouses	Melons, fruits and beans	m3/mu	Provincial synthesis	Tube-well irrigation (watering)	100
	Stem leaves	m3/mu	Provincial synthesis	Tube-well irrigation (watering)	160
Outdoor vegetables	Melons, fruits and beans	m3/mu	II	Tube-well irrigation (watering)	90
		m3/mu	III	Tube-well irrigation (watering)	60
		m3/mu	IV	Tube-well irrigation (watering)	100
	Stem leaves	m3/mu	II	Tube-well irrigation (watering)	120
		m3/mu	III	Tube-well irrigation (watering)	100
		m3/mu	IV	Tube-well irrigation (watering)	130
Planting of fruits and nuts	Woody plants	m3/mu	Provincial synthesis	Spray irrigation	70
	Herbs	m3/mu	Provincial synthesis	Spray irrigation	100
Tea		m3/mu	Provincial synthesis	Spray irrigation	120
Cultivation and planting of woods		m3/mu	Provincial synthesis	Spray irrigation	130
Konjak processing		m^3/t	Provincial synthesis	-	25
Tea processing		m^3/t	Provincial synthesis	-	20
Plum processing		m^3/t	Provincial synthesis	-	3
Walnut processing		m^3/t	Provincial synthesis	-	6

Table 5.4.1-3 Guizhou province irrigation partition of animal husbandry

Category name	Scale	Water quota unit	Partition	Quota value
Cattles	More than 100	L/each. d	Provincial synthesis	60
sheep	More than 100	L/ each. d	Provincial synthesis	30
Pigs	More than 100	L/ each. d	Provincial synthesis	30
Chicken	More than 1, 000	L/ each. d	Provincial synthesis	1.5

The water quotas of the project locations are calculated according to the standard values of the table 5.4.1-1, the table 5.4.1-2 and the table 5.4.1-3, and are seen in the table 5.4.1-4 in details.

Table 5.4.1-4 List of quota values of all industries in the project areas

Category name	Project location	Quota value	Implementation scale of the project	Water quota value（m^3）
Tea	III, IV	120 m3/mu	13400mu	1608000
Walnuts	II, III, IV	70 m3/mu	33953mu	2376710
High-quality plums	II	70 m3/mu	16000mu	1120000
Grapes	II, III, IV	70 m3/mu	4000mu	280000
Vegetables	III	60 m3/mu	2000mu	120000
Ramie	IV	130 m3/mu	2000mu	260000
Seed konjak	IV	130 m3/mu	2700mu	351000
Potatoes	II	90 m3/mu	14567mu	1311030
	IV	100 m3/mu	13000mu	1300000

traditional Chinese medicinal materials	II, III, IV	130 m3/mu	27643mu	3593590
Forage grass	II, III	70 m3/mu	8905mu	623350
	Subtotal			1243680
Sheep	II, III	30L/each .d	16, 830	100475
Pigs	IV	30L/ each .d	2, 000	11940
Chickens	II, IV	1.5L/ each .d	1, 320, 000	415800
	Subtotal			528215
Konjak processing	IV	25 m^3/tt	8100t	202500
Tea processing	III, IV	20 m^3/t	5360t	107200
Plum processing	II	3 m^3/t	8000t	24000
Walnut processing	III	6 m^3/t	8848t	53088
	Subtotal			386788
Total				13858683

The engineering water storage of the project location is 21, 306, 127m^3, at present, the irrigation water capacity of the project location is 18, 139, 500 m^3, and the rest of water storage is 2, 910, 500 m^3. The planting projects which are planed to be implemented are carried out on the primary cultivated lands, and the new irrigation area is not increased, so that water base for planting is not changed; and the water capacity of the newly increased land is used for cultivation, research and processing. As you see in the table 5.4.1-4, the water capacity for newly increased cultivation and processing is 915, 000 m^3 and only occupies 31.44% of 2, 910, 500 m^3 of the water storage in the project location, so that water demand can be met. In addition, the implementation project further comprises a part of impounding reservoir projects, the water usage can be increased to a certain extent.

5.4.2 Land resources for the project

According to the statistical data of all counties of the project area in 2012, the project covers 11 counties, 63 villages and towns, 2, 350 stockaded villages in total. The proportion of the land occupation of the project which is planned to be implemented is less than 105 of the project area, and details are seen in 5.4.2-1.

Table 5.4.2-1 List of the proportion of newly increased land occupation of the project planned to be implemented in the project area

Land types	Existing area of project area (hectare)	Project implementation area (hectare)	Proportion in project area (%)
Total area of land	526736	8400.18	1.59
Cultivated land	107775	6988.33	6.48
Forest land	186453	9.52	0.005
Orchard	16201	733	4.52
Available grassland	15102	-	-
Available wasteland	31518	669.33	2.12

5.5 Environment assimilative capacity analysis

5.5.1 Daily excretion of feces of livestock and poultry

According to the specification of the table A.2 in *Technical Specifications for Pollution Treatment Projects of Livestock and Poultry Farms (HJ497-2009)*, and details are seen in the table 5.5.1-1:

Table 5.5.1-1 Daily excretion of feces of different livestock and poultry

Items	Unit	Cattle	Pigs	Chickens	Ducks
Feces	kg/each ·d	20.0	2.0	0.12	0.13
	kg/each ·a	7300.0	398.0	25.2	27.3
Urine	kg/each ·d	10.0	3.3	-	-
	kg/each ·a	365.0	656.7	-	-
Raising cycle	d	365	199	210	210

According to *Discharge Standard of Pollutants For Livestock and Poultry Breeding*

(GB18596-2001), the breeding quantity of the sheep is converted into the breeding quantity of the pigs in intensive sheep farms and sheep raising areas, and the conversion proportion is that three sheep is converted into one pig.

5.5.2 Fertilizing condition by using feces of livestock

According to the related specification of *Detailed Rules of Emission Reduction Accounting for Total Amount Principal Pollutant in Twelve-Five Planning* in Ministry of Environmental Protection, farms shall provide definite feces destination or user using certificate. Under the general condition, the annual feces digestion amount per mu does not exceed the output of 5 pigs (Slaughter=15 sheep), 200 chickens (Slaughter), 50 laying hens (Livestock on hand), 0.2 beef cattle (Slaughter), 0.4 dairy cattle (Livestock on hand). The feces fertilizing conditions of livestock in the project implementation counties are seen in the table 5.5.2-1.

Table 5.5.2-1 List of feces fertilizing conditions of existing animals in the project counties

Project implementation counties	**Product names**	**Existing scale (thousands)**	**Annual feces digestion amount per mu**	**Cultivated land amount needed by the feces fertilizing（hm^2）**	**Existing cultivated land amount in the project counties（hm^2）**	**Existing occupied cultivated land amount for feces fertilizing in the project counties（hm^2）**	**Residual cultivated land amount in the project counties（hm^2）**
Wuchuan County	Large animals	10 (Livestock on hand)	0.4 large animal	16667	61049	21220	39829
		4 (Slaughter)	0.2 large animal	1333			
	Pigs	194	5 pigs	2587			
	Sheep	82	15 sheep	364			
	Small poultry	809	200 small poultry	269			
Nayong County	Large animals	133(Livestock on hand)	0.4 large animal	22167	95638	39231	56407
		36(Slaughter)	0.2 large animal	12000			
	Pigs	294	5 pigs	3920			
	Sheep	134	15 sheep	595			
	Small poultry	1648	200 small poultry	549			
Weining County	Large animals	213(Livestock on hand)	0.4 large animal	35500	71670	63414	8256
		47(Slaughter)	0.2 large animal	15666			
	Pigs	820	5 pigs	10933			
	Sheep	243	15 sheep	1080			
	Small poultry	1707	200 small poultry	235			
Shiqian County	Large animals	58(Livestock on hand)	0.4 large animal	9667	22270	16946	5324
		12(Slaughter)	0.2 large animal	4000			
	Pigs	214	5 pigs	2853			
	Sheep	38	15 sheep	169			
	Small poultry	770	200 small poultry	257			

Yanhe County	Large animals	65(Livestock on hand)	0.4 large animal	10833	*26327*	*22279*	*4048*
		21(Slaughter)	0.2 large animal	7000			
	Pigs	247	5 pigs	3293			
	Sheep	202	15 sheep	898			
	Small poultry	764	200 small poultry	255			
Yinjiang County	Large animals	42(Livestock on hand)	0.4 large animal	7000	18593	15037	3556
		16(Slaughter)	0.2 large animal	5333			
	Pigs	190	5 pigs	2533			
	Sheep	3	15 sheep	13			
	Small poultry	475	200 small poultry	158			

Table 5.5.2-2 List of feces fertilizing conditions of newly increased animals in the project planed to be implemented

Project implementation counties	**The project which is planed to be implemented**		**Annual feces digestion amount per mu**	**Cultivated land amount needed by the newly increased feces fertilizing（hm^2）**	**Existing occupied cultivated land amount in the project counties（hm^2）**	**Proportion（%）**
	Product names	**Scale (thousands)**				
Wuchuan County	Sheep	5.88	15 sheep	26.13	39829	0.07
Nayong County	Pigs	2	5 pigs	26.67	56407	0.05
Weining County	Small poultry (raise chickens)	240	200 small poultry	80	8256	0.97
Shiqian County	Small poultry (raise chickens)	50	200 small poultry	16.67	5324	0.31
Yanhe County	Sheep	10.95	15 sheep	*48.67*	*4048*	*1.20*
Yinjiang County	Small poultry (raise chickens)	90	200 small poultry	30	3556	0.84

5.5.3 Fertilizing condition of urine of livestock

According to the related specification of *Detailed Rules of Emission Reduction Accounting for Total Amount Principal Pollutant in Twelve-Five Planning* in Ministry of Environmental Protection, the farms which use sewage/urine for agriculture use shall be built with rainproof impermeable sewage/urine storage tanks. Under the general condition, the volume of the storage tanks shall contain more than 2 months of sewage/urine output (the volume of the storage tank shall be not less than 0.3 m^3 when each live pig is slaughtered), and the definite sewage/urine destination or user using certificate shall be provided. Under the generation condition, the annual sewage/urine digestion amount per mu does not exceed the output of 5 pigs (slaughter), 0.2 beef cattle (slaughter), 0.4 dairy cattle (Livestock on hand). The livestock fertilizing conditions in the project implementation counties are seen in the table 5.5.3-1.

Table 5.5.3-1 List of urine fertilizing condition of existing livestock in project counties

Project implementation counties	**Product names**	**Existing scale (thousands)**	**Annual urine digestion amount**	**Cultivated land amount needed by urine**	**Existing cultivated land amount of the project**	**Cultivated land amount for fertilizing urine in the project**	**Residual cultivated land amount in the project**

			per mu	**fertilizing（hm^2）**	**counties（hm^2）**	**counties（hm^2）**	**counties（hm^2）**
Wuchuan County	Large animals	10(Livestock on hand)	0.4 large animal	16667	61049	21220	39829
		4(Slaughter)	0.2 large animal	1333			
	Pigs	194	5 pigs	2587			
	Sheep	82	15 sheep	364			
	Small poultry	809	200 small poultry	269			
Nayong County	Large animals	133(Livestock on hand)	0.4 large animal	22167	95638	39231	56407
		36(Slaughter)	0.2 large animal	12000			
	Pigs	294	5 pigs	3920			
	Sheep	134	15 sheep	595			
	Small poultry	1648	200 small poultry	549			
Weining County	Large animals	213(Livestock on hand)	0.4 large animal	35500	71670	63414	8256
		47(Slaughter)	0.2 large animal	15666			
	Pigs	820	5 pigs	10933			
	Sheep	243	15 sheep	1080			
	Small poultry	1707	200 small poultry	235			
Shiqian County	Large animals	58(Livestock on hand)	0.4 large animal	9667	22270	16946	5324
		12(Slaughter)	0.2 large animal	4000			
	Pigs	214	5 pigs	2853			
	Sheep	38	15 sheep	169			
	Small poultry	770	200 small poultry	257			
Yanhe County	Large animals	65(Livestock on hand)	0.4 large animal	10833	*26327*	*22279*	*4048*
		21(Slaughter)	0.2 large animal	7000			
	Pigs	247	5 pigs	3293			
	Sheep	202	15 sheep	898			
	Small poultry	764	200 small poultry	255			
Yinjiang County	Large animals	42(Livestock on hand)	0.4 large animal	7000	18593	15037	3556
		16(Slaughter)	0.2 large animal	5333			
	Pigs	190	5 pigs	2533			
	Sheep	3	15 sheep	13			
	Small poultry	475	200 small poultry	158			

Table 5.5.3-2 List of urine fertilizing condition of newly increased livestock in the project planned to implement

Project implementation counties	Project planned to implement		Annual urine digestion amount per mu	Cultivated land needed by newly increased urine fertilizing（hm^2）	Existing residual cultivated land amount in the project counties（hm^2）	Proportion (%)
	Product name	Scale (thousands)				
Wuchuan County	Sheep	5.88	15 sheep	26.13	39829	0.07
Nayong County	Pigs	2	5 pigs	26.67	56407	0.05
Weining County	Small poultry (raise chickens)	240	200 small poultry	80	8256	0.97
Shiqian County	Small poultry (raise chickens)	50	200 small poultry	16.67	5324	0.31
Yanhe county	Sheep	10.95	15 sheep	*48.67*	*4048*	*1.2*
Yinjiang County	Small poultry (raise chickens)	90	200 small poultry	30	3556	0.84

As you can see in the table 5.5.2-1, 5.5.2-2, 5.3.3-1 and 5.3.3-2, except Yanhe county, other project counties have enough environment holding capacity and can meet fertilization by the feces and urine of livestock as organic fertilizers in the project area. But soil eutrophication, environment pollution, water pollution and the like may be caused by using the organic fertilizes too much, so that the project shall expand the utilization ways of the feces of livestock according to the actual condition of the area, so that the use ratio can be improved and the environmental influence can be alleviated. For instance, produced biogas with technical maturity belongs to clean energy which is generally spread in the countryside, so that the residential energy resources of farmers in the vast rural areas can be solved, and the influence and damaged on the environment caused by fire coal, firewood and the like can be reduced.

6 ANALYSIS OF ALTERNATIVES

Analysis of alternatives is designed to optimize the project design and provide a scientific basis for decision-making for the project choice through comparing the rage and extent of influence on ecological environment by the different designs and proposing a environmental optimization when project construction in terms of resources and the environment. General principles of the analysis of alternative options as follow:

(1) Quantify the selection principle: quantify the influence of environment by project implementation as possible in every alternatives.

(2) Synthetize the selection principle: hold a comprehensive comparative analysis in several aspects like environmental, technical, economic, social and so on.

(3) Selection principle with coincidence: the picked program should be matched up to the relevant development plans and standards, as well as the local conditions.

6.1 With and without project comparison

Table 6.1-1 list of with and without comparison analysis

category	**with**	**without**
advantages	(1) The project implementation brought industrial road and field sidewalk and so on; and tank-building for the irrigation of the farmland and land, which improved the working conditions of farmland service, the efficiency and productivity of the land, and full economic and social benefits of land. (2) The project implementation increased the acreage of endemic medicines (bellflower, arrowroot, Tianma, etc.), tea, and economic crop. Through new technologies offered by companies, dispensing has improved yield, increased production, improve land utilization, and reduced the pollution of the surrounding environment by agricultural activities. (3) The project implementation processed waste of planting and breeding, marketed fruit-marsh-animal, vegetable-marsh-livestock and other agricultural model, and collected poultry manure to process organic fertilizers, which is extremely beneficial and could avoid some disadvantages. Also, in that way, regional industries with local advantages initially formed, the return of a large number of organic fertilizers farmland, increasing organic matter in the soil, soil fertility and better soil structure. (4) The project implementation harden the road, reduced product loss , vehicle fuel consumption, and further reduced solid waste and waste gas during transportation, which is helpful to protect the local environment.	(1) Maintain the statue existing, such as plant will not be destroyed. (2) Land use value in project location will not be changed (not occupied land, etc.). (3) There is no environmental impacts such as construction noise, waste gas, waste water and solid waste by the infrastructure facilities during construction period. (4) There is no any waste water, waste gas, noise and solid waste when running the infrastructure facilities. (5) There is no increase of water use for the cattle, sheep, pig farming activities, easing the local water shortage.
disadvantages	(1) Infrastructure like office, breeding sites, storage sites, trading venues after the project implementation occupied a lot of land, among the land, a lot of the land use is irreversible. (2) Construction of the project will destroy vegetation, produce dust, noise, waste water, waste gas, solid waste, etc., which affect the surrounding environment. (3) Operation period after the project implementation will generate run-dust, noise, waste water, waste gas, solid waste, etc., which affect the surrounding environment. (4) The project implementation led to increase of the local number of cattle, sheep and pig, and the acreage of potatoes, walnuts, ramie, arrowroot, etc., which changed the usual way of land use and affect the local ecological balance to a certain extent.	(1) In each project area, the leading industry resource's comprehensive degree of the development and use is low. Single structure of relevant industries, short industry chain, terrible waste of resources and energy, and easy to form a variety of environmental pollution. (2) Poor road infrastructure will increase the loss of the product, and product rum-dust during transportation, and increase waste gas produced by the transportation. (3) Advanced management experience can not applied to planting and breeding; Unnecessary environmental pollution in planting and breeding; The lower contribution to economic growth. (4) Unreasonable compost for animal manure and plant's stem and leaves; Continuing improper processing of animal urine and flushing

		sewage; Pollution of the outflow of nutrients in livestock manure.
Comprehensive analysis	From the social and environmental point of view, the implementation of the project plan is better than zero solution.	

6.2 Comparisons of disposal methods of manure

Manure in farm is fertilizer if that can be processed properly instead of pollution, to the contrary, if they can not be processed properly, it's a wasting way to process organic fertilizer. Manure in farm are both pollution and fertilizer anyway. Farming manure disposal hereby as follow:

Table 6.2.1 selection of retail investors' farming manure disposal

Category	**Stockpiling compost**	**Household digesters of water pressure type**	**Anaerobic zero-emissions of dry-dilute separation**
Process Description	Pile up manure, then with heat preservation and ferment, to make organic matter into inorganic nutrients.	Feces, urine, wash water flow into digester of water pressure type. Biogas slurry emissions and sludge cleansed as fertilizer.	1. Producing organic fertilizer products via colleting and storing manure. 2. Making biogas via urine, wash water in anaerobic digester. Biogas used for heating, and biogas slurry for woodland and farmland fertilization.
Scope	Retail investors' farm	Small and medium farm	Small, medium and big farm
Advantages	1.Low investment and operating costs; few energy consumption. 2.Easy to manage, and less impacts on the surrounding environment; no noise. 3.Local fertilizer use reduced and soil fertility improved.	1.Get part of biogas. 2.Handle a large amount of manure and sewage.	1.Occupies little with good effect 2.Commercial organic fertilizer and biogas-using gain a good economic benefit. 3.Numorious remaining organic nutrients in processed biogas slurry can be used.
Disadvantages	1.Low handling capacity 2.Require a lot of land to use manure 3.The presence of risk of transmission of animal diseases and zoo noses.	1.Limited degradation and terrible pollution after emission 2.Caused huge loss of organic fertilizers	Require a certain area of farmland woodland to consume manure and slurry
Conclusion	Not recommended	Not recommended	Recommended

Table 6.2.2 selection of centralized farming manure disposal

Category	**Medium and big digester**	**Ferment of anaerobic and aerobic of dry-dilute separation**	**Anaerobic zero-emissions of dry-dilute separation**
Process Description	Feces, urine, wash water flow into digester. Biogas slurry emissions and sludge cleansed as fertilizer after ferment.	1.Manure collected and stored used be produce commercial organic fertilizer local or outward transport. Or supply farmers unpaid nearby. 2.Urine, wash water flow in anaerobic digester, then emission in aerobic tank and oxidation pond.	1.Manure collected and stored used be produce commercial organic fertilizer local. 2.Urine, wash water in anaerobic digester. Biogas used for heating, and biogas slurry for woodland and farmland fertilization.

Scope	medium and big farm	medium and big farm	Small, medium and big farm
Advantages	Product commercial organic fertilizer and biogas, gaining a good economic benefit.	Product commercial organic fertilizer and biogas, gaining a good economic benefit.	1.Occupies little with good effect 2.Commercial organic fertilizer and biogas power generation gain a good economic benefit. 3.Numorious remaining organic nutrients in processed biogas slurry can be used. 4. Zero emission.
Disadvantages	1.Higher investment 2.Poor continuity of production, thus low digestibility. 3.Ferment with low concentrations, thus low productivity.	1.High investment and covering wide with bad effect. 2.Processed waste water is still difficult to fully met, which led to pollution emissions. 3.Caused numorious loss of organic fertilizer.	Require a certain area of farmland woodland to consume manure and slurry
Conclusion	Not recommended	Not recommended	Recommended

For the above approach, the "anaerobic zero-emissions of dry-dilute separation" is the most feasible and the most worthy of promotion way. It has many advantages, and apply to big, medium and small farms. The zero emission of biogas slurry is the core of anaerobic processing on farming manure and sewage. Anaerobic processing could get high-quality biogas, and zero-emission solved the problem of pollution and the loss of organic fertilizers. Especially some situation about organic fertilizer, for example, with no increase of farmers who do not feed cattle and pigs, which is getting the situation very prominent. The project picked the approach of the "anaerobic zero-emissions of dry-dilute separation".

6.3 Comparison of different planting patterns

The comparison focus on the planting pattern advised by the project and traditional planting pattern, including selection of planting plots, land clearing, land preparation methods, economic fruit forest's a forestation density, plating pattern, fertilizing and irrigation, pest control, etc., detailed in Table 6.3-1.

Table 6.3-1 selection of different planting patterns

Related Factors	**Planting pattern of the project**	**Traditional planting pattern**
Waste grassland cleanup	Taking massive or bagged for cleaning; Following the original terrain topography; Retaining native grasses in ecologically fragile areas or larger slope; Reducing soil erosion and nutrient loss and protecting biodiversity.	Destroyed original vegetation and flatten slope, which easily lead to soil erosion and nutrient loss and is not conductive to protecting biodiversity.
Land preparation methods	Walnut: cave-like site preparation, and dig the planting hole along the contour; Amorphophallus: pit soil and deep plowing before winter; deep tillage and fine integration after spring; Potatoes: deep plowing in winter, shallow plowing after spring, and breaking clods to flatten the ground. Retaining native grasses and slope forest and constructing ridge and cofferdam; Land with large slope is unsuitable for reclamation.	Comprehensive reclamation and ribbon preparation lead to land disturbance area of 30%~100%,which destroy vegetation terribly and cause soil erosion.
Selecting seed	Project area are equipped with seedings and seed breeding base. Excellent selection of suitable high-yield developing and pest-resistant seed in the region.	Uneven variety of seeds, poor disease resistance, and low yield.
Planting density	Walnuts: 3 X 5m; Amorphophallus: determining the line spacing based on four times or six times of the size of Amorphophallus Konjac; Potatoes: dig nest using wide and narrow ridge of high	Lack of professional guidance; greater density; inadequate nutrient supply and lighting; poor yield and disease resistance.

	compartment ; three boxes; nests from 0.9-1 feet, acres of plant from 4000-4400; To ensure good lighting condition and nutrients supply; forming a rational healthy stable structure of tree, shrub, and grass; improving disease resistance and yield.	
Planting pattern	Amorphophallus planted in walnuts' understory species achieve short-time income. Intercropping improved soil structure of economic fruit forest and soil nutrient content, reduced soil erosion and pest diseases. Crop rotation in favor of a balanced consumption of soil nutrients and reducing hazards of weeds and pests associated with crop.	Large-scale cultivation of a single species with a single planting structure prone to pests, low disease resistance, and reducing synergies between species.
Fertilizing	For soil nutrients content and the plant growth cycles' needs, fertilizing through field guild, soil monitoring and diagnosis of plant nutrition. Combining organic manure and chemical fertilizers to avoid area- source pollution in moderate fertilizing.	Lack of specific fertilizer; few knowledge about manure and chemical fertilizers; blind fertilization; easy to a waste of resources and lead to area-source pollution.
Conclusion	Remended	Not remended

6.4 Green pest control scheme and traditional method

Table 6.4-1 selection of green prevention and control scheme and traditional anti-pest scheme

category	**traditional anti-pest**	**green prevention and control**
advantages	(1) Easy to operate, and no needs of professional training (2) Low initial funding and equipment investing (3) Early pest control quick	(1) Using a variety of prevention and control techniques on ecology and biology; thorough pest control. (2) Low pesticide residues in products; less harmful to human health. (3) Reducing the use of pesticides and solving the problem of area-source pollution. (4) Creating green food line with national industrial policy; better market; easy to open markets and increase income.
disadvantages	(1) Excessive use of pesticides lead to area-source pollution as well as cause environmental pollution problem in surface water, groundwater and air pollution. (2) Long-term and excessive use of pesticides is easy to make antibodies in pests, which lead to poor pest control and waste money, eventually form a vicious cycle. (3) Making regional specialty products without a competitive advantage	(1)Higher initial investment. (2)Training for growers to large scale promotion; small regional implementation with so-so effect.
Comprehensive Analysis	The project area are both poor rural areas. Oranges, potatoes, walnuts, etc., are competitive in market. Via implementation of green prevention and control and creation of green product, broader market can be provided. Beside, implementation of green prevention and control line with national industrial policy and has a good environmental benefits in the prevention of area-source pollution. To sum up, green prevention and control scheme can be achieved sustainable agricultural development, in line with the regional status quo, and reduce regional area-source pollution. Although it is with higher initial investment, then with long-term benefits. So green prevention and control scheme recommended.	

6.6 Comparison of slaughter site

Comparison of the pig slaughtering plant site in Nayong County as follow:

Table 6.6-1 selection of different scheme

Related Factors	**Nayong Fumin animal husbandry limited liability company**	**Zhuchang**

Social impact	Address in Shibanhe village, Yongxi town, Nayong County. It is 4 km away from the county. Slaughterhouse in a residential area, surrounded by about 30 residents.	Address in Zhuchang township in Nayong. It is 2 km away from Zhuchang township. No residents living within 300m aroun the slaughterhouse.
Impact on nearby rivers	Slaughterhouse close to the river which flows through the Nayong county.	Nearby river flows into Jianxin River; no centralized water-drinking points
Planning Compliance	In the "planning and setting of small slaughtering site in Nayong "	In the "planning and setting of small slaughtering site in Nayong "
Distance away from the Nuogu pig farms	25 km away	Zhuchang is the site of Nuogu pig farm, and that is 4 km away from the other site named Kunzhai and 6 km away from Zuozhiga.
Conclusion	Not recommended	Recommended

7 Public Participation

7.1 Purpose and objects

Public participation in the environmental impact assessment is a method to know attitude and view to the construction project of organization and people at all social levels, meanwhile, it's an opportunity for people to participate into the environmental impact assessment of construction project. So public participation makes the environmental impact assessment of construction project more democratic and public, avoid one-sided decision and causing difficulty and obstruction to the following work. According to *Environmental Impact Assessment of PRC* and current provisions, environmental impact assessment of construction project must listen to the opinions of residents.

1. Let public know the purpose, scale, location of construction project and caused pollutions and control measures planning to be taken in the construction process of project and after the operation of the completed construction, let public give their opinions and get their understanding, support and cooperation.

2. The consultation with local permanent residents on their experience and intuitive feelings of residence and environment can help to analyze current quality and level of environmental factors of the area and reflect the objective degree of environmental impact assessment, protect interests of public.

3. According to actual condition of project and scope of impact of the project to confirm that public participate all the related areas of the project and survey respondents are people and community affected directly or indirectly by the project.

7.2 Survey methods

Methods of public participation in the environmental impact assessment mainly are information bulletin and social survey, i.e. make public know general situation of the project via bulletin and collect information via interview and questionnaire. Generally common methods are quantitative survey and semi-quantitative survey. Quantitative survey can get statistics of high precision usually with questionnaire; Semi-quantitative survey can use any method. Social survey may understand the impact of areas of the project on local environment and economy comprehensively and deeply.

7.2.1 Information notice

1. First public information: from 27 Nov. 2013 to 16 Dec. 2013, published on website of 11county people's government related to the project and posted in related town and village committee. Public may find the details of first information bulletin on public page of websites of counties and some photos of scene for the bulletin in some counties refer to picture 7.2-1.

2. Second public information: from 22 Apr. 2014 to 11 May, 2014, published on website of Guizhou Poverty Alleviation Office (http://www.gzfp.gov.cn) and public may learn more about the project in *Report of Environmental Impact of development project of*

Guizhou Village loaned from World Bank (first draft). Keep people informed of the time, location and feedback method of publicity. The second public information please refer to (http://www.gzfp.gov.cn), part of the notice and photo of scene please refer to picture 7.2-2.
Remarks: Notice first, start the survey after at least two weeks, so environmental assessment shall also adopt this time order.

7.2.2 Interview and questionnaires to the public

During the site survey and investigation, interviews and questionnaires are used to listen to the voices of the local publics to the project and the resettlement of inhabitant. Interviews also involved the local residential committees and some related units within the project construction areas. The "public involving investigation tables" are given out to the local residents by the proprietors related to listen to the local residents' voices about the construction of the project. More than 120 pieces of the tables are given out.

1. Giving out tables to the groups related: Given that the project involves many environment factors and its expertise characters, survey tables are also given out to the construction sector and the EIA and some related government and enterprise sectors.

2. Giving out survey tables to the individuals: In order to fully understand the public's attitude towards the project, tables of "the environment impact assessment of the public to the rural development project of the Guizhou province supported by the World Bank loan "are issued to the public that involved to the project. In the survey tables, the detailed information of the project is introduced; what's more the investigators also explained the problems that the public did not know. The individuals are asked to fill the tables by themselves. The table is attached.

3. Handling method of the feedbacks: The feedback retrieve proportion is up to 90% and then analyze the results to find out the issues that most concerned by the public

（1） Government notice of the Wuchuan

（2） The first government notice of the Gaodong county Wuchuan

(3) The site survey of Xinchang country Wuchuan

Picture 7.2-1 The site survey pictures of the first government notice of the public

(2) The county committee notice of the Xiaojin country Yanhe

(3) The site survey of the Xiaojin country Yanhe

Picture 7.2-2 The site survey pictures of the second government notice of the public

7.3 The results analysis of the first survey

7.3.1 The results of the first public involved survey

1. The object being investigated and its formation

Two weeks after the first public notice, 1320 pieces of the public attitudes table are all taken back, among which 1100 pieces are individual attitudes investigation, and 220 pieces are for the groups and units. All of the tables are taken back.

(1) Individuals

The people surveyed are mostly the people around the project, the occupation, nationalities, gender, age and education background are shown in the table 7.3-1.

Table 7.3-1 the formation of the public investigation of the environment impact of the construction project

	category	amount (person)	Proportion (%)		category	amount (person)	proportion (%)
age	Below 30	137	12	gender	male	945	86
	31-40	298	27		Female	155	14
	41-50	410	37	occupation	farmer	863	78
	51-60	185	17		Business man	31	3
	Above 61	62	6		Government working staff	145	13
	Null	8	1		other	61	6
nationality	The Han people	454	41.3	Education back ground	Bachelor or above	49	4
	Gelao people	122	11.1		Technical secondary	184	17
	Tujia people	280	25.5		High school	100	9
	The Miao people	157	14.3		Middle school	572	52
	The Tong people	40	3.6		Primary school	187	17
	The Bai people	3	0.3		illiteracy	8	1
	The Yi people	35	3.2				
	The Buyi people	9	0.8				

From the table 7.3-1 we can see that the people surveyed is from all walks of life, from farmers to government working staff, from senior people to the youth, from the person of primary educated to the belcher educated persons. Thus, we can say the investigation is credible and effective.

(2) Consultation table of social organizations and units

The investigation list of social organizations includes the surrounding organs, enterprises and institutions, village committees and the like, and the total number of the organizations is 220. The list of the units investigated is shown in Table 7.3-2.

Table 7.3-2 List of Investigated Units

No.	Unit Name	No.	Unit Name
Zunyi City			
1. Wuchuan County			
1	Stylistic Broadcasting Tourism Bureau of Wuchuan Gelao and Mao Nationalities' Autonomous County	11	Fengle Niutang Village Committee of Wuchuan Gelao and Mao Nationalities' Autonomous County
2	Housing and Urban-Rural Development Bureau of Wuchuan Gelao and Mao Nationalities' Autonomous County	12	Fengle Tiancun Village Committee of Wuchuan Gelao and Mao Nationalities' Autonomous County

3	Office of Tea Development Leading Group in Wuchuan County	13	Fengle Village Committee in Fengle Town of Wuchuan Gelao and Mao Nationalities' Autonomous County
4	Tea Industry Development Center of Wuchuan Gelao and Mao Nationalities' Autonomous County	14	Fengle Chaping Village Committee of Wuchuan Gelao and Mao Nationalities' Autonomous County
5	Huangdu Gaodong Village Committee of Wuchuan Gelao and Mao Nationalities' Autonomous County	15	Huangdu Tea Station of Wuchuan Gelao and Mao Nationalities' Autonomous County
6	Huangdu Land Resources of Wuchuan Gelao and Mao Nationalities' Autonomous County	16	Fengle Land Resources of Wuchuan Gelao and Mao Nationalities' Autonomous County
7	Fengle People's Government of Wuchuan Gelao and Mao Nationalities' Autonomous County	17	Xinchang Village Committee of Wuchuan Gelao and Mao Nationalities' Autonomous County
8	Muyikang Tea Co., Ltd. in Wuchuan Autonomous County	18	Huangdu Central for Little of Wuchuan Gelao and Mao Nationalities' Autonomous County
9	Huazhou Tea Factory in Wuchuan County	19	Tea Committee in Wuchuan Autonomous County
10	Forestry Bureau of Wuchuan Gelao and Mao Nationalities' Autonomous County	20	Fishery Management Station of Wuchuan Gelao and Mao Nationalities' Autonomous County
2. Daozhen County			
1	Longxing Center Health Center of Daozhen County	11	Longxing Credit Union of Daozhen Rural Credit Association
2	Dagan Branch of Daozhen Industrial and Commercial Bureau	12	Ethnic Affairs Bureau of Daozhen Autonomous County
3	Daqian Tobacco Workstation, Daozhen Branch of Guizhou Tobacco Company	13	Dagan Credit Union of Daozhen Rural Credit Association
4	Daozhen Supervision and Administration for Safe Production	14	Shebayu Branch of Daozhen Rural Credit Association
5	Daozhen Environmental Protection Bureau	15	Daozhen Bureau of Statistics
6	Daozhen Confederation of Trade Unions	16	Doazhen Hongfu Tea Development Co., Ltd.
7	Daozhen Daqian Kindergarten	17	Daozhen Longxing Primary School
8	Daozhen Investment Promotion Bureau	18	Daqian Central School in Daozhen
9	Civil Affairs Bureau of Daozhen Mulao Nationality Autonomous County	19	Daozhen Qixin Primary School
10	Daozhen Investigation Team of National Bureau of Statistics	20	Daozhen Daqian Primary School
3. Zhengan County			
1	Jianping Forestry Station of Zhengan County	11	Jianping Village Building Management Service Center of Zhengan County
2	Gelin Comprehensive Office of Social Security of Zhengan County	12	Baolong Village Committee in Jianping Township, Zhengan County
3	Lejian Village Building of Lejian Township, Zhengan County	13	Jianping Supervision and Administration for Safe Production of Zhengan County
4	Gelin Supervision and Administration for Safe Production of Zhengan County	14	Jianping Agricultural Service Center of Zhengan County
5	Lejian Branch of Zhengan Institute of Animal Health Supervision	15	Jianping Water Station of Zhengan County
6	Tuping Office of Finance of Zhengan County	16	Gelin Social Affairs Office of Zhengan County
7	Longquan Village Committee in Jianping Township, Zhengan County	17	Gein Village Building Management Service Center in Zhengan County
8	Jianshan Village Committee in Jianping Township, Zhengan County	18	Changing Village Committee in Lejian Township, Zhengan County
9	Baolong Village Committee in Jianping	19	Baofeng Village Committee in Gelin Town,

	Township, Zhengan County		Zhengan County
10	Hezuo Village Committee in Jianping Township, Zhengan County	20	Liaoyuan Village Committee in Lejian Township, Zhengan County
Tongren City			
4. Dejiang County			
1	Xianjin Village Committee of Changfeng Township, Dejiang County	11	Yantang Tujia Social Affairs Office of Dejiang County
2	Changfeng Tujia Township Traffic Management Station, Dejiang County	12	Yantang Human Resources and Social Security Management Center of Dejiang County
3	Gaoshan Town Planning and Construction Station, Dejiang County	13	Yantang Tujia Comprehensive Office of Social Security of Dejiang County
4	Gaoshan Forestry Recycling Station, Dejiang County	14	Shaxi Tujia Agricultural Service Center of Dejiang County
5	Gaoshan Office of Justice of Dejiang Justice Bureau	15	Shaxi Tujia Office of Economic Development of Dejiang County
6	Gaoshan Water Station of Dejiang County	16	Zhonggong Shaxi Qinba Branch Committee
7	Gaoshan People's Government of Dejiang County	17	Quankou Social Affairs Office of Dejiang County
8	Gaoshan Social Affairs Office of Dejiang County	18	Quankou Tujia Water Station of Dejiang County
9	Quankou Population and Family Planning Office of Dejiang County	19	Quankou Town Planning and Construction Station, Dejiang County
10	Yantang Tujia Water Station of Dejiang County	20	Quankou Human Resources and Social Security Management Center of Dejiang County
5. Yanhe County			
1	Guanzhou Branch of Yanhe Tujia Autonomous County Finance Bureau	11	Xiaojing Branch of Yanhe Tujia Autonomous County Finance Bureau
2	Qiaojia Civil Affairs Office of Yanhe Tujia Autonomous County	12	Zhongjie New Rural Cooperative Medical Management Station, Yanhe County
3	Shazi Immigration Station of Yanhe Tujia Autonomous County	13	Zhongjie People's Government of Yanhe Tujia Autonomous County
4	Shazi Comprehensive Office of Social Security of Yanhe County	14	Zhongjie Road Traffice Safety Management Office of Yanhe County
5	Shazi Branch of Yanhe Tujia Autonomous County Finance Bureau	15	Longxing Village Committee of Zhongjie Township, Yanhe Tujia Autonomous County
6	Nanzhuang Village Committee of Shazi Town, Yanhe County	16	Guanzhou Agricultural Technical Extension Station of Yanhe County
7	Huangjin Village Committee of Yanhe Tujia Autonomous County	17	Guanzhou Police Station, Public Security Bureau of Yanhe Tujia Autonomous County
8	Shazi Supervision and Administration for Safe Production of Yanhe County	18	Guanzhou Labor and Social Security Office of Yanhe Tujia Autonomous County
9	Xiaojing Population and Family Planning Office of Yanhe County	19	Guanzhou Poverty Alleviation and Development Office of Yanhe County
10	Xiaojing Township Civil Affair Office of Yanhe Tujia Autonomous County	20	Guanzhou Social Affairs Office of Yanhe County
6. Sinan County			
1	Liangshuijing Branch of Sinan Finance Bureau	11	Daheba Population and Family Planning Office of Sinan County
2	Liangshuijing Agricultural Service Center of Sinan County	12	Daheba Social Public Service Center of Sinan County
3	Liangshuijing Comprehensive Control of Social Management Committees Office of Social Security of Sinan County	13	Daheba New Rural Cooperative Medical Management Station of Sinan County
4	Liangshuijing Office of Justice of Sinan Justice	14	Daheba Office of Justice of Sinan Justice

	Bureau		Bureau
5	Banqiao Tujia and Miao Water Station of Sinan County	15	Daheba Traffic Management Station of Sinan County
6	Banqiao Human Resources and Social Security Service Center of Sinan County	16	Tangtou Human Resources and Social Security Service Center of Sinan County
7	Silin Road Traffic Safety Office of Sinan County	17	Tangtou Agricultural Service Center of Sinan County
8	Banqiao New Agricultural Cooperative Medical Management Station of Sinan County	18	Tangtou Road Traffic Safety Office of Sinan County
9	Silin Supervision and Administration for Safe Production of Sinan County	19	Tangtou Social Affairs Office of Sinan County
10	Daheba Road Traffic Safety Management Station of Sinan County	20	Tangtou Branch of Sinan Finance Bureau
7. Yinjiang County			
1	Muhuang Labor and Social Security Office of Yinjiang County	11	Shazipo Garden Management Office of Yinjiang Autonomous County of Tujia and Miao Nationalities
2	Muhuang Supervision and Administration for Safe Production of Yinjiang County	12	Banxi Comprehensive Management Committee of Social Security of Yinjiang County
3	Muhuang Disabled Persons Federation of Yinjiang County	13	Banxi Judicial and Legal Affairs Committee of Yinjiang Autonomous County of Tujia and Miao Nationalities
4	Muhuang New Agricultural Cooperative Medical Management Station of Yinjiang County	14	Banxi Workstation for Poverty Alleviation of Yinjiang Autonomous County of Tujia and Miao Nationalities
5	Guochang Village Committee of Xinye Township, Yinjiang County	15	Banxi Social Affairs Office of Yinjiang Autonomous County of Tujia and Miao Nationalities
6	Heshui Specialized Cooperatives of Mountain Edible Fungus in Yinjiang County	16	Banxi Police Station, Public Security Bureau of Yinjiang Autonomous County of Tujia and Miao Nationalities
7	Shazipo People's Government of Yinjiang County	17	Xinye Animal Husbandry and Aquaculture Station of Yinjiang Autonomous County of Tujia and Miao Nationalities
8	Shazipo Civil Administration Welfare Shares of Yinjiang County	18	Xinye Population and Family Planning Technology Service Station of Yinjiang County
9	Shazipo Management Committee of Yinjiang County	19	Xinye New Agricultural Cooperative Medical Management Station of Yinjiang County
10	Shazipo Walnut Industry Development Office of Yinjiang County	20	Xinye Labor and Socal Security Office of Yinjiang County
8. Shiqian County			
1	Pingshan Human Resources and Social Security Service Center of Shiqian County	11	Shigu Supervision and Administration for Safe Production of Gelao and Dong Nationalities in Shiqian County
2	Pingshan Gelao and Dong Nationalities Social Affairs Office of Shiqian County	12	Shigu Comprehensive Office of Party and Government of Gelao and Dong Nationalities in Shiqian County
3	Pingshan Gelao and Dong Nationalities Comprehensive Office of Party and Government in Shiqian County	13	Shigu Office of Economic Development of Gelao and Dong Nationalities in Shiqian County
4	Pingshan Gelao and Dong Nationalities Water Station of Shiqian County	14	Huaqiao Office of Economic Development of Shiqian County
5	Longjing Gelao and Dong Nationalities Social Affairs Office of Shiqian County	15	Shuixi Village Committee of Longjing Gelao and Dong Nationalities in Shiqian County

6	Huaqiao Council of Trade Unions of Shiqian County	16	Huaqiao Agricultural Service Center of Shiqian County
7	Longjing Supervision and Administration for Safe Production of Shiqian County	17	Population and Family Planning Office of Huaqiao People's Government, Shiqian County
8	Longjing Human Resources and Social Security Service Center of Shiqian County	18	Huaqiao People's Government of Shiqian County
9	Longjing Tea Management Station of Gelao and Dong Nationalities in Shiqian County	19	Benzhuang Agricultural Service Center of Shiqian County
10	Shigu Water Station of Gelao and Dong Nationalities in Shiqian County	20	Benzhuang Comprehensive Office of Party and Government of Shiqian County
Bijie City			
9. Nayong County			
1	Longchang Land Resources Office of Nayong County	11	Gukai Hexin Village Committee
2	Longchang Agricultural Development Center	12	Gukai People's Government
3	Longchang Zhujiaying Village Committee	13	Chuangyu Tea Co., Ltd. in Nayong County
4	Zhuchang People's Government	14	Guangming Village Committee of Weixin Town
5	Zhuchang Shanjiao Village Committee	15	Longchang Social Service Office
6	Zhuchang Xiaodongkou Village Committee	16	Weixin People's Government
7	Kunzhai Central Village Committee	17	Longchang Family Planning Association
8	Shangwafang Village Committee of Zuojiuga Township	18	Lianfu Village Committee of Longchang Town
9	Poqi Village Committee of Zuojiuga Township	19	Paomaba Village Committee of Longchang Town
10	Tiaozi Village Committee of Zuojiuga Township	20	Yanjing Village Committee of Weixin Town
10. Hezhang County			
1	Songlinpo Primary School of Hezhang County	11	Caishen Xiaohai Village Committee of Hezhang County
2	Huangjiazhai Village Committee of Songlinpo Township	12	Caishen Village Committee of Caishen Town, Hezhang County
3	Kele Power Supply Station of Hezhang County	13	Caishen Central Primary School of Hezhang County
4	Kele Xianjie Household Appliances of Hezhang County	14	Luobuga Goats Professional Cooperatives in Caishen Town, Hezhang County
5	Kele Nongchang Village Committee	15	Fuchu Xingfu Primary School of Hezhang County
6	Kele Fengshou Village Committee	16	Shuitang Chinese Herbal Medicine Planting Professional Cooperatives of Shuitangbao Township, Hezhang County
7	Kele Cooperation Office	17	Shuitang Detoxification Potato Planting Cooperatives of Shuitangbao Township, Hezhang County
8	Kele Village Committee of Kele Township	18	Shuichao Breeding Professional Cooperatives of Hezhang County
9	Caishen Center Health Center of Hezhang County	19	Shuichao Village Committee of Shuitangbao Township, Hezhang County
10	Caishen Luobuga Village Committee of Hezhang County	20	Yemachuan People's Government of Hezhang County
11. Weining County			
1	Xinfa People's Government of Weining County	11	Liulin Village Committee of Longchang Town
2	Kaiping Party Working Committee of Xinfa Township	12	Yuanshan Village Committee of Longchang Town
3	Baota Party Working Committee of Xinfa Township	13	Water Station of Longchang Town

4	Jinzhong People's Government	14	Water Service Center of Longchang Town
5	Lianmin Village Committee of Jinzhong Town	15	Changping Village Committee of Longchang Town
6	Duzha Village Committee of Jinzhong Town	16	Quanfa Village Committee of Shimen Township
7	Hekuai Village Committee of Longchang Town	17	Yingping Village Committee of Shimen Township
8	Longchang Cultural Service Station	18	Xinlong Village Committee of Shimen Township
9	Safety Supervision Station of Longchang Town	19	Xinmin Village Committee of Shimen Township
10	Longchang People's Government	20	Nianfeng Village Committee of Shimen Township

2. Statistic results

The results are in the table 7.3-3 and 7.3-4

Table 7.3-3 the stand points of the public to the planned construction project (personal)

Contents of inquire		Statistical observations		
S/N	**Questions**		**Amounts (persons)**	**Valid questionnaires proportion (%)**
1	Do you know the World Bank is going to loan money to support the rural development projects of Guizhou province?	Yes	1085	98.64
		No	15	1.36
		I don't remember	0	0.
		others	0	0
2	Where do you get the information?	Government notice	1002	91.09
		News media	54	4.91
		Website	24	2.18
		Others	25	2.27
3	How do you concern about the project?	Very much concern	947	86.09
		Concern	126	11.45
		A little concern	36	3.27
		Don't concern	1	0.09
4	How do you think about this project's affection to the environment?	Positive affection	923	83.91
		Negative affection	13	1.18
		No affection	153	13.91
		I don't know	12	1.09
5	Which fields do you think this project might affect most seriously?	Atmospheric environment	364	33.09
		Water environment	110	10.00
		Ecological environment	466	42.36
		Acoustic environment	169	15.36
6	Is there any affection to your life or family?	Positive affection	911	82.82
		General affection	144	13.09
		Little affection	40	3.64
		Negative affection	5	0.45
7	How do you think this project might affect the local economy and society?	Positive affection	1008	91.64
		General affection	78	7.09
		Little affection	11	1.00
		Negative affection	0	0
8	Taking all advantages and disadvantages into consideration, how do you think about the projects?	The advantages overweight the disadvantages, the project is feasible	1066	96.91
		It is hard to choose for the advantage equals the disadvantages	18	1.64

Contents of inquire		Statistical observations		
		The disadvantages overweight the advantages, the project is infeasible	5	0.45
		I don't know	11	1.00
9	What's your attitude towards this project?	Support	1089	99.00
		ok	10	0.91
		Do not support	0	0
		Do not concern	1	0.09
10	Which kind of survey do you prefer?	Interview	761	69.18
		Questionnaires	179	16.27
		discussions	132	12.00
		others	23	2.09
11	Which way do you like to publish the project information?	Government notice	966	87.82
		News media	90	8.18
		Website	38	3.45
		others	6	0.55
12	What kind of suggestion do you have to the implementation of the project?	1. I hope the implementation of the project to be quick. 2. I hope the service to the Animal epidemic prevention to be in time. 3. I hope the project be invited to my country. 4.I hope the project to start earlier, the earlier the better.		

The investigation of the public stand point in table 7.3-3 indicates:

(1) The aspect of the known of the project among the public: the proportion of people knew the project is 98.64% and the proportion of people did not know the project is 1.36%, which indicates that the promotion of the project is quiet well and the public is much concern about such poor aiding project.

(2) The aspect of the origin of the project information: 91.09% of the people surveyed get the project information from the website which is quite related to the notice on the government notice; 4.91% of them get the information from the news media which is related to the local news media promotion.

(3) The public concern to the project: 86.09% of the local people are quite concerning about this kind of the project because the loan of the World Bank will support the local economy and help people getting rich. This is quite related to the life of the local people, so they are quite concern of the project.

(4) The environment affection of the project to the local ecology: 83.91% of the people surveyed think the project will take a positive affection to the local ecology and 13.91% of them think on affection will happen. Only 1.18% of them think there might be some negative affection to the local ecology.

(5) The biggest impact to the environment: 42.36% of the people surveyed think the ecological impact is the biggest, the second is the atmospheric environment impact (33.09%) and the third is the acoustic environment impact (15.36%) the last is the water impact (10%) .

(6) The impact on the family life: 82.82% of the surveyed people think there will positive impact to the family life of the local people, 13.09% of them think there will be little, only 0.45% think there might be negative impact.

(7) The social and economic impact of the project: 91.64% of the surveyed people think there will be positive impact, 7.09% think there won't be any change and no one think there will be any negative impact.

(8) The advantages and disadvantages of the project: 96.91% of the surveyed people think the advantages over weight the disadvantages which indicate the project is

advantageous.

(9) The attitudes towards the project: no objection.

(10) The desired typed survey: 69.18% prefer interview, 16.27% prefer questionnaires and 12% prefer discussion, which provide us a guidance for the second survey.

Table 7.3-4 The stand points of the public to the planned construction project (group)

Contents of inquire		**Statistical observations**		
S/N	Questions		Amounts (group)	**Valid questionnaires proportion (%)**
1	Do you know the World Bank is going to loan money to support the rural development projects of Guizhou province?	Yes	217	98.64
		No	3	1.36
		I don't remember	0	0
		Others	0	0
2	Where do you get the information?	Government notice	200	90.91
		News media	15	6.82
		Website	13	5.91
		Others	4	1.82
3	How do you concern about the project?	Very much concern	192	87.27
		Concern	22	10.00
		A little concern	6	2.73
		Don't concern	0	0
4	How do you think about this project's affection to the environment?	Positive affection	197	89.55
		Negative affection	0	0
		No affection	24	10.91
		I don't know	1	0.45
5	Which fields do you think this project might affect most seriously?	Atmospheric environment	50	22.73
		Water environment	40	18.18
		Ecological environment	103	46.82
		Acoustic environment	28	12.73
6	Is there any affection to your life or family?	Positive affection	189	85.91
		General affection	26	11.82
		Little affection	5	2.27
		Negative affection	0	0
7	How do you think this project might affect the local economy and society?	Positive affection	190	86.36
		General affection	23	10.45
		Little affection	7	3.18
		Negative affection	0	0
8	Taking all advantages and disadvantages into consideration, how do you think about the projects?	the advantages overweight the disadvantages, the project is feasible	220	100.00
		it is hard to choose for the advantage equals the disadvantages	0	0
		The disadvantages overweight the advantages, the project is infeasible	0	0
		I don't know	0	0
9	What's your attitude towards this project?	Support	220	100.00
		Ok	0	0
		Do not support	0	0
		Do not concern	0	0
10	Which kind of survey do you prefer?	Interview	123	55.91
		Questionnaires	59	26.82
		Discussions	40	18.18

Contents of inquire		Statistical observations		
		Others	3	1.36
11	Which way do you like to publish the project information?	Government notice	190	86.36
		News media	25	11.36
		Website	10	4.55
		Others	0	0
12	What kind of suggestion do you have to the implementation of the project?	1. Strengthen the implementation；2. Start the project as earlier as possible 3. Agree to start the project soon；4. Hope to start soon we		

The results of the table 7.3-4 indicate:

(1) The aspect of the known of the project among different groups: 98.64% of the group surveyed knew the project, only 1.36% of them have no idea on this project. This indicates that the promotion the project is well and the groups are quiet concern about this poor aiding project.

(2) The information origin of the project: 90.91% of the groups surveyed get the project information from the government notice, which is quite related to the government notice on the government website before. 6.82% of them get the project information from the news media, which is related to the local news media promotion.

(3) The aspect of the project concern of the groups: 87.27% of the groups surveyed are quite concern about this kind of project, because the World Bank loan will bring in wealth and opportunities to the local government and society.

(4) The aspect of the project impact to the local ecologic environment: 89.55% of the groups surveyed think the project might bring positive impact and 10.91% of them think no impact will happen.

(5) Utmost environmental influence the project brings: Ecological impact is believed to constitute 46.82%, then atmospheric environmental impact (22.73%), acoustical environmental impact (12.73%), water environmental impact(18.18%), respectively.

(6) Survey of the influence to groups the project brings: It is regarded that positive effect constitute 86.36%, normal effect 10.45%.This program is a kind of poverty alleviating program and will bring positive effect to local environment.

(7) Survey of economical and social influence to local areas the project brings: Positive effect constitutes 86.36%，normal effect constitute10.45%,no negative effect.

(8) Investigation and statistics of the beneficial effect and adverse effect of the project construction: The idea this project “does more good than harm” constitutes 100%, and that means respondents believe the construction of this project brings profits.

(9) Survey of the attitudes about the building project: No one opposes.

(10)Which kind of surveys the institutions would like to take part in: Questions and answers constitute 55.91%, then questionnaires and interviews constitute 26.82%, and discussions constitute 18.18%.This provide directions for second survey.

7.3.2 The second investigation and statistical results the public take part in

1. Constitution and proportion of respondents.

After two weeks the first notice was announced, at the second time we give out 1320 questionnaires, and recycle 1320 questionnaires, with a questionnaire-reclaiming rate of 100%.There are 1100 individual questionnaires, 1100 recycled; there are 220 social groups and institutions questionnaires, 220 recycled.

(1) Individual

This survey involves the people who live in perimeter districts the program can influence, the respondents’ job, sex, age, nationalities and cultural level can be seen in table 7.3-5 below.

Table 7.3-5 respondent’s constitution

Item	category	number (individual)	Percentage (%)	Item	category	number (people)	Percentage (%)
Age	Under 30	111	10.09%	Sex	Man	985	89.55%
	31-40	331	30.09%		Woman	115	10.45%
	41-50	416	37.82%	Profession	Farmer	918	83.45%
	51-60	172	15.64%		Personal	57	5.18%
	Up 61	70	6.36%		Cadre	110	10.00%
Nationality	Ethnic Han	420	38.18%		Else	15	1.36%
	Kelao	124	11.27%	Degree of education	Bachelor or above	13	1.18%
	Tujia	327	29.73%		Technical secondary	112	10.18%
	Miao	142	12.91%		Senior	97	8.82%
	Dong minority	32	2.91%		Junior	670	60.91%
	Ni	43	3.91%		Primary	207	18.82%
	Buyi	3	0.27%		Illiteracy	1	0.09%
	Hui	2	0.18%				
	Chuanqin	5	0.45%				
	Mongolia	1	0.09%				
	Yao	1	0.09%				

From Table 7.3-5, this public investigation involve all class of society, including peasants in the perimeter district, cadres, people aged from young to old, cultural level from primary school to college of all kind of literacy class, 10 nationalities. Therefore, this investigation is considered to be representative and comprehensive. With high randomness, results are reliable.

(2) Social groups, institution questionnaires: survey list of social groups include 220 perimeter government departments, corporations, public institutions, and village committees. This survey units are same with the first survey units, but at the second time Yuanjianping Country in Zheng'an County has changed its name to Furongjiang Town. Investigating list can be seen in Table 7.3-2.

2. Investigation and statistics results can be seen in Table7.3-6 and Table7.3-7.

Table 7.3-6 Summary of Related Opinions On Building Project (Individuals)

Research content		Opinion statistics		
S/N	Questions		number (Groups)	Ratio of valid questionnaires (%)
1	Do you know Developing program in rural areas Of Guizhou of World Bank Loan in your district?	Yes	1094	99.45%
		No	5	0.46%
		I can't remember	0	0
		Others	1	0.09%
2	Where do you get the information?	Government notice	995	90.45%
		Press and Media	37	3.36%
		Websites	10	0.91%
		Others	68	6.18%
3	Which level of attention do you pay to the project?	Much attention	948	86.18%
		Normal attention	142	12.91%
		Little attention	7	0.64%
		No attention	3	0.27%
4	What kind of influence do you think this project will make to local	Positive effects	841	76.45%
		Negative effects	0	0

Research content		Opinion statistics		
	ecological environment?	No effects.	248	22.55%
		I don't know	11	1.00%
5	What do you think is the biggest influence the project will bring?	Atmospheric environment	410	37.27%
		Water environment	124	11.27%
		Ecological environment	460	41.82%
		Acoustical environment	254	23.09%
6	What kind of influence do you think this project will make to your corporation?	Positive much impact	918	83.45%
		Normal impact	110	10.00%
		Little impact	72	6.55%
		Negative impact	0	0
7	What kind of influence do you think this project will make to local economy and society?	Positive much impact	942	85.65%
		Normal impact	111	10.09%
		Little impact	47	4.27%
		Negative impact	0	0
8	With all advantages and disadvantages of this program into consideration, what do you think of it?	Do more good than harm, accessible	863	78.45%
		Either has its pros and cons, no choice.	225	20.45%
		Do more harm than good ,not accessible	12	1.09%
		I don't know	0	0
9	Which kind of opinion do you hold in this program?	Supportive	1100	100%
		Normally whatever	0	0
		Opposed	0	0
		Whatever	0	0
10	Which kind of aspects would you like to take part in?	Questions and answers	1100	86.19%
		Questionnaires and interviews	0	13.36%
		Discussion	0	0.45%
		Others	0	0
11	Which kind of information publication would you like?	Government notice	948	99.45%
		Press and Media	147	0.46%
		Websites	0	0
		Others	1	0.09%
12	Other suggestion on the program	1、 hope implement and complete the program as soon as possible 2、 strengthen training 3、 agree to implement and benefit more people		

From table7.3-6, individual survey and statistics results indicate that:

(1)Individuals' knowledge of the program of the questionnaire survey: People who know about the program constitute99.45%, people who don't know constitute 0.46%, this shows that through first draft's announcement and participation of the public, more local people are aware of this program.

(2)The sources of information: 90.45% of the masses' information sources is government announcement. This relates to the pre-project's public announcement in the county government's website. News and media constitute 3.36%, this has relations with local news and media's propaganda of Poverty Alleviation Office. Other sources are in connection with public participation of environment and society criticism about the program.

(3)Concern level: 86.18% of local groups pay much attention to this kind of program, especially those living in the implementing area. Because world bank loan's poverty alleviation program help local inhabitants make money. This is closely bound up with local inhabitants' life, so the program has gotten much attention. Normal attention constitute

12.91%

(4)Influence to local ecological environment the program brings: 76.45% of the respondents argue that implementation of the program bring positive influence, while 22.55% believe it doesn't make any difference. Through first draft's announcement of environmental reports and propaganda and preliminary analysis about the influence to local environment after implementation of this program, local people understand all kinds of precaution measures. This makes respondents believe this program has no negative influence to local environment.

(5) The investigation result about the project's greatest impact on the environment shows that its impact on ecological environment is the greatest one (accounting for 41.82%) and the rest are atmospheric environment (accounting for 37.27%), acoustical environment (accounting for 23.09%) and water environment (accounting for 11.27%). The reason is that the project is mainly involved with planting, breeding industry and etc. which will be the main aspect influencing ecology.

(6) The investigation about the project's impact on individual or family life shows that: 83.45% of the polled reckon that the implementation of this project will bring some positive influence on their individuals and their family life with no negative effect. As one anti-poverty project, it will help to bring much more challenges of getting rid of poverty and becoming rich for local poor families after the project is implemented.

(7) The investigation about the project's impact on local economy and society shows that: 85.64% of the polled reckon that the implementation of this project will bring some positive influence on local economy and society with no negative effect. As one anti-poverty project, it has been made in combination with local characteristic planting and breeding as well as the real development of local economy and society, therefore 85.64% of the polled reckon that the project will bring some positive effect on the development of local economy and society.

(8) The investigation about the feasibility of measures to be taken in accordance with the first draft of environmental impact assessment report shows that: The polled with the opinion of very reasonable account for 78.45% and those with no reasonable is 0. With the help of the publicity of the first draft of environmental impact assessment report, local villagers can have much more understanding in the impact on environment from the project and taken measures and they become awareness that the project will have less impact on local environment if it is implemented as requested.

(9) The investigation about the comprehensive consideration of the advantage and disadvantage of the project shows that: 100% of the polled reckon that its advantages overweigh its disadvantages, namely the project is feasible. That means local villages already understand the detailed contents, how to implement the project and how to prevent its impact on environment and etc.

(10) The investigation and statistics about the attitude on the construction project: There is no objection to this project.

Table 7.3-7 The public's opinion about the planned project (organization)

Investigation contents		**Opinion statistics**		
S/N	**Problems**		**Q'ty (Pcs)**	**Proportion of effective questionnaire (%)**
1	Does your company know World Bank is providing loans to Guizhou Rural Development Project in your region?	Know	220	100%
		Don't know	0	0
		Don't remember	0	0
		Others	0	0
2	Form where does your company get the information?	Government notice	211	96%
		New media	12	5%

		Website	7	3%
		Others	8	4%
3	The degree your company places attention on this project?	Special attention	210	95%
		General attention	10	5%
		Little attention	0	0
		No attention	0	0
4	How do you think about the impact on the local ecology and environment brought by the project?	Positive impact	198	90%
		Negative effect	0	0
		No influence	22	10%
		Don’t know	0	0
5	In your opinion, which will be greatest one among the influences brought by it?	Atmospheric environment	72	33%
		Water environment	27	12%
		Ecological environment	81	37%
		Acoustical environment	76	35%
6	In your opinion, how does this project give influence on your company?	Great positive influence	191	87%
		General impact	23	10%
		Small impact	6	3%
		Negative effect	0	0
7	In your opinion, what kind of impact will this project bring to local economy and society?	Great positive influence	208	95%
		General impact	6	3%
		Small impact	6	3%
		Negative effect	0	0
8	In your opinion, whether the first draft of environmental impact assessment report together with taken measures is feasible.	Very reasonable and feasible	192	87%
		Reasonable and feasible	28	13%
		Don’t know	0	0
		Not reasonable and feasible	0	0
9	How do you think about the project’s advantages and disadvantages comprehensively?	Advantages overweigh its disadvantages, feasible project	220	100%
		Advantage equals to disadvantage, difficult to choose	0	0
		Disadvantage overweighs advantage, unfeasible project	0	0
		Don’t know	0	0
10	What attitude does you company have on this construction project?	Support	205	93%
		Don’t matter	15	7%
		Don’t support	0	0
		Indifferent	0	0
11	Your opinion or suggestion about the implementation of the project:	No		

The following are indicated by the investigation and statistics of table 7.3-7about organization：

(1) The investigation about the some organization's awareness of the project shows that: 100% of the polled know this project. This indicates that a strong publicity has been given for this project in target region and some organizations have given a higher attention on this kind of anti-poverty project.

(2) The investigation about information sources: 96% of the polled organizations get the information via government publicity, which has some relation to the publicity of local county government's website and the rest getting the information via new media and website accounts for 5% and 3% respectively, which have some relation to the publicity on local new media by local Anti-poverty Office.

(3) The investigation about their attention rate on the project: 95% of the polled organizations concern the project highly and all organizations place some attention on it. This project will foster local characteristic planting and breeding industry, moreover help local villagers in getting rid of poverty and becoming rich.

(4) The investigation about the project's impact on local ecological environment: 90% of the polled organizations reckon that the implementation of this project will bring some positive impact but not side influence. With the help of the publicity of the first draft of environmental impact assessment report, local organizations come to understand its main contents and taken measures, moreover the implementation of this project will have no side influence on local ecological environment.

(5) In your opinion the greatest impact on environment brought by the project: in their opinion, the greatest one is that on ecological environment (accounting for 37%) and the rest are acoustical environment and atmospheric environment. It has some relation to implemented contents, namely the reason is that the project is mainly involved with the construction for planting, breeding industry and etc.

(6) In your opinion, what kind of impact will this project will bring to you: Positive influence 87%, general 10% and side influence 0.

(7) The investigation about organizations' opinion about the project's impact on local economy and society: Positive impact and general impact account for 95% and 3% respectively and there is no side influence.

(8) In your opinion, whether the first draft of environmental impact assessment report and taken measures are feasible: those with the opinion of very reasonable and feasible account for 87% and no opinion of not reasonable.

(9) The investigation about your comprehensive consideration of the project's advantage and disadvantage: those with advantage overweighing disadvantage account for 100%, which indicates the polled organizations reckon that the project will bring profit to local region.

(10) The investigation and statistics about their attitudes on the construction project: There is no objection to the project.

7.3.3 The public's participation in forum

Two villages have been chosen for opening forum with the public's participation at random in target county for the environment assessment at the same time when the public participated in the issuing of the questionnaire. Related villagers participates in it with higher enthusiasm and they can express their own opinion and suggestions. They are mainly expressed in followings in accordance with forum result: all villagers are in favor of the implementation of the project, welcome the settlement of rural development project, participate in its implementation voluntarily and they hope the project can be started earlier in order to promote the local development and help them in getting rid of poverty and becoming rich; service for animal epidemic prevention should be given in place; they hope

much more investment should be given in supporting the poor, enhancing the construction of rural infrastructure, providing much more farm machinery, increasing train for villages in production technology, improving agricultural production level, finally enhancing villagers' income, improving their production and life environment, moreover promoting the industry development and the adjustment of agricultural structure.

7.4 Conclusion with the participation of the public

The statistics about questionnaire shows that 100% of the public are in favor of the project, namely there is no objection to it; that's to say the public have positive attitude on it. During the publicity of the information, we does not receive any objection from any people or organization; most of villagers and cadres reckon that the implementation of this project will help to improve the production and living environment for rural populations in project-targeted county, moreover promote the industry development and the adjustment of agricultural structure; The implementation of this project will promote the development of secondary and tertiary industry, create large quantity of employment opportunities, moreover promote the development of regional economy and help poor population out of poverty. They hope the project can be started early. That's to say local masses are in favor of this project.

8 ENVIRONMENTAL MANAGEMENT PLAN

Construction and operation of the project will cause some impact on the project area and the surrounding environment, thus environment protection measures must be taken to prevent, reduce, lessen or compensate for adverse environmental impacts.

Therefore, in order to ensure effective implementation of environmental protection measures and coordinately simultaneous development of environmental, social and economic benefits, environmental management and environmental monitoring must be intensified so that the project could conform to the policy of simultaneous planning, developing and operating between economic development and environment protection.

Environment management plan is divided into four parts: environmental responsibility and institutional arrangements, environmental protection precaution plan, environmental monitoring programs and environment protection training programs.

8.1 Institutional arrangements and responsibilities

Environmental Management in Guizhou rural development projects is undertaken by the Foreign Capital Project Management Center of Guizhou Poverty Alleviation and Development Office. The 11 County Project Offices are responsible for the specific implementation. See specific environment management institution and responsibilities in Chart 8.1-1.

Chart 8.1-1 Arrangements and Responsibilities of the Environment Management Institutions of Guizhou Rural Development Project

Period	Relevant Party of the Project	Environment Management Responsibilities
1	Infrastructure Project Activities	
Design and Preparation	Owners and / or PMO	1. Responsible for specific design, supervision, construction, equipment and materials procurement, 2. Project bidding and approval work, the EIA report, management plan approval
	Design Department and EIA	EIA: preliminary environmental impact assessment; Design department: engineering survey and design; modifying the measures for environment protection based on EIA report.
	County-level Construction Bureau, Bureau of Water	Supervising and inspecting whether the construction and engineering design is reasonable, tendering and bidding, project supervision, construction quality and construction safety

	Resources, Department of Transportation	
	Environment Protection Administration	Checking whether pollution control facilities are equipped, whether the design will meet the standards.
Operation Period	Owners and / or PMO	1. Supervising the implementation of mitigation measures in construction period according to Environment Management Plan; 2. To carry out the publicity of mitigation measures in construction period according to Environment Management Plan.
	County-level Construction Bureau, Bureau of Water Resources, Department of Transportation	Supervising the implementation of various measures of infrastructure construction, civil construction and construction safety
	Contractor and Construction Team	Specific implementation of mitigation measures in construction period according to Environment Management Plan
	Farmer / Village	Village committees should actively cooperate to safeguard the legitimate rights and interests of the villagers as well as supervise the construction
	Environment Protection Administration	To guide and supervise the implementation of mitigation measures in construction period according to Environment Management Plan
Operation Period	Owners and Operators	1. Specific implementation of mitigation measures in operation period according to Environment Management Plan. 2. Supervising the construction progress, quality and safety in operation period 3. To organize relevant environment monitoring 4. Periodic report to superior PMO and the World Bank
	Farmers, Cooperatives, Village Collectives	1. Specific implementation of mitigation measures in operation period according to Environment Management Plan; 2. Project monitoring: environment protection, supplies reducing
	Environment Protection Administration	To guide and supervise the implementation of mitigation measures in operation period according to Environment Management Plan
	Water Conservancy Bureau, Department of Transportation / Roads	To guide and supervise the implementation of mitigation measures in operation period according to Environment Management Plan
2	Agricultural Project Activities	
The preliminary Designing Period	PMO	To carry out the project approval work, the training for promotion backbones, the publicity and mobilization for villagers, as well as relevant training about Environment Management Plan and Pest Management Plan.
	Country Agriculture and Animal Husbandry and the Subordinate Plant Protection Station	Agriculture and Animal Husbandry: leading the reasonable adjustment of agricultural structure, the rational allocation of agricultural resources Plant Protection Station: monitoring fertilization, pests and epidemic diseases, and providing dynamic pest data and the timely release of pest cases, carrying out relevant training about Environment Management Plan and Pest Management Plan.
	Veterinary Station	To carry out publicity and training; relevant training about Pest Management Plan
	Farmer	Selecting cooperative management personnel to join in the project construction
	Cooperative	To establish preparatory groups and cooperatives for the project application, design sewage facilities for cooperatives
	Village collective	publicity
	Environment Protection Administration	Making a scientific analysis and recommendations to optimize the project design
Operati	PMO	1.Periodic check on the implementation of Environment Management

on Period		Plan and Pest Management Plan 2.Carry out Environment Management Plan and Pest Management Plan training 3. Organize relevant environment monitoring 4.Periodic report to superior PMO and the World Bank
	Country Agriculture and Animal Husbandry and the Subordinate Plant Protection Station	Plant Protection Station: pest control guiding, pest control technology promoting and organic fertilizer and pesticide residue guiding for farmers, pollution-free production. Agriculture and Animal Husbandry: the organization of production, introduction and promotion of the test seedlings, fertilizers, pesticides, veterinary drugs and other products, the guidance of quality monitoring, enforcement supervision and management of the agriculture input in seeds, fertilizers, pesticides, veterinary drugs.
	Veterinary Station	Carry out livestock services before, during and after production, train and guide village service personnel, and carry out technology demonstration household and large farms.
	Farmer	No using of prohibited pesticides, fertilizers, proper handling of garbage involved in project implementation
	Village Collective	Involving in project implementation, management, and periodically supervising the probable environmental impact in production processes
	Cooperative/Processing Unit	To implement the project according to environment protection requirements and relevant requirements of enterprises sewage, comprehensively carrying out pollution control; Bring in new technologies, new varieties, technical training, technical exchanges and advisory services,
	County Environment Protection Administration	Carrying out environment supervision and inspection; To organize and guide environmental publicity and education in project areas, promote the popularization of environment science, laws and regulations.
	County Forestry Bureau	To promote the standardization of orchards, technical guidance of pollution-free production

8.2 Environmental Mitigation Measures

To minimize or eliminate the probable negative impacts on the natural environment so as to ensure the full realization of expected benefits of the environment target, the following environment protection measures and regulations are offered.

Based on national and local laws and regulations, standards and norms, during the implementation of this environment protection regulation, the fully drawing on the experience of the project area, or similar domestic projects, with reference to the World Bank Environment, Health and Safety General Guidelines, Livestock Mammal Field Environment, Health and Safety Guidelines, Annual Agricultural Environment, Health and Safety Guidelines, and Food and Beverage Processing Environment, Health and Safety Guidelines, and the combination with considering of impacts on various activities of the project, the following environment regulations and mitigation measures are offered.

8.2.1 Environmental protection regulations of infrastructure projects

Projects involving roads, water infrastructure, market and processing plant construction, the environmental impacts of which during the construction period are similar, mitigation measures are also similar, so a unified description about the common environmental impacts is offered, general measures are listed in Chart 8.2 -1.

8.3 EnvironmentalTraining Program

8.3.1 Purpose of environmental protection training

Environment management knowledge and skills training will offer to management staffs, farmers and cooperatives in project-covered areas at all levels, to enable them to fully understand the positive and negative environmental effects in implementation of the project

and relevant technology and measures of Environmental Management Plan, thus to enable them to carefully and accurately perform environment protection policies in implementation of the project.

According to training subjects, the environment protection training is divided into three levels: project management staffs at all levels (including province, city, county, township project management), technical staffs (including construction technician, project management and agricultural technicians), farmers and workers.

8.3.2 EnvironmentalTraining Program

Environmental training, together with other activities will be carried out mainly in the starting period of the project, to ensure that all participants fully understand their responsibilities in the implementation of activities related to environment protection, and better understand the reasons for environment monitoring management programs as well as the project itself and the long-term active effects on economic development and people's health.

Environment protection awareness training subjects should include PMO management personnel and farmers involved in the project, to ensure a better understanding about the environmental impact assessment, environmental management and monitoring plan and how to bring about active impacts on production when implementing the project. Training programs are shown in Chart 8.3-1.

Chart 8.2-1 Environment Protection Regulations in Infrastructure Construction Period

Period	Major Negative Period		Mitigation / Prevention Measures	Investment Estimation (Ten thousand Yuan)	Performer	Supervisor
Design	Impacts on the surrounding sensitive points around the project through site selection, land occupation, construction operations		1.All building materials are purchased in the infrastructure projects, material area and land-based borrow area will not be newly opened; Earth-rock excavation will be backfilled, spoil ground will not be built; the implementation of the project will not involve occupation of basic farmland, fertile soil and woodland and destroying of vegetation, no effect on the vegetation. 2.Layout construction site scientifically, choose construction period reasonably, try to avoid the rainy season, excavation of earth-work in rainy day; select construction processes reasonably meaning backfill soil stone timely, put into use promptly, try to shorten the temporary piling time of soil stone; strip or collect 0-30cm mellow topsoil when temporarily using farmland or forest land, and timely reclamation after construction; Transport, pave and press the soil material at any time to reduce loose soil. 3. Strengthen publicity and education, ban on deforestation of forest vegetation, and forbid the killing of wild animals.	-	Project construction units	-
Operation	Ecological Environment	Construction: earthwork excavation, site formation and soil and stone spoil piling; destruction of vegetation, production of crops impact, disturbance of wildlife activities, landscape impact, soil erosion and other ecological	1.Layout construction site scientifically, choose construction period reasonably, try to avoid the rainy season, excavation of earth-work in rainy day; select construction processes reasonably meaning backfill soil stone timely, put into use promptly, try to shorten the temporary piling time of soil stone; strip or collect 0-30cm mellow topsoil when temporarily using farmland or forest land, and timely reclamation after construction; Transport, pave and press the soil material at any time to reduce loose soil. 2, Considering the terrain conditions in construction site, the soil drains should be set around the site, and the soil drains grit chamber should be set around the soil drains so as to slow down the flow of catchment and reduce sediment in the grit chamber. 3.Combine key water and soil conservation protection with surface protection, combine engineering measures with plant protection measures, exert the efficiency and security role of engineering measures with engineering measures as leading measures and planting measures as supporting measures, to achieve long-term soil and water conservation and environment greening and beautifying projects around the project-covered areas. 4.Strengthen publicity and education, ban on deforestation of forest vegetation, take a scientific, rational measure of water conservation, minimize the occupation of land; report to superior authorities and take action to protect the endangered wild plants, ancient woods and endemic plants during the construction process; remove the temporary facilities and loose the hardening soil timely after construction, and implement comprehensive governing, restore grass, return the	220	Construction units and project construction units	County Environment Protection Administration, Housing Construction Bureau, Forestry, Animal Husbandry Bureau, Water, Sanitation Department, Integrated Management Department of Township Environment

		damage.	arable land to farmers etc. 5. To intensify public education, forbid the killing of wild animals, adopt advanced blasting method, and reduce the noise disruption on animals. Report to superior authorities and take action to protect the endangered wild plants, ancient woods and endemic plants found during the construction process. 6. Vegetation restoration measures are the main plant protection measures, the following technique key points should be emphasized in the restoration of plants: preserve the permanent forest covering areas and the mellow soil in temporary land occupation, provide fertile soil for vegetation restoration; collect and preserve the topsoil of forest land occupied in construction and layout plants in the barren soil; preserve the mellow soil in temporary occupation of land before construction, and clean up, loose, and restore mellow soil, crop or choose plants to restore timely after construction. 7. Carrying out construction supervision and investigation of the ecological environment in construction and operation periods. During the construction period, monitoring and fire inspection should be carried out in construction areas involving the forests; construction units should strengthen the investigation on regional key protection plants and old trees, if the key protection plants are found during construction, report to superior authorities and take action to protect the endangered wild plants. Manage strictly the construction that could cause wood fire, strengthen management of construction workers, and forbid using of fire in forest during forest fire banning period. 8. According to the characteristics of the project and different slope ratio local climate and geological conditions, choose extensive grass and shrub plants that can adapt to local natural conditions, restore the plants in excavation slope, and reduce post-stage protection. Select key sections of the slope to carry out artistic treatment, mainly to present local cultures by the way of plants landscaping. Moreover, cut the slope top in a circular arc way in order to form a natural transition with the slope and avoid harsh slope cutting.			
	Air	Gravel processing, concrete mixing, material transportation will dust, blasting, vehicle exhaust emissions, road dust, household energy using of construction teams	1. To use advanced construction technology and low dust blasting technology, use wet crushing and dust extraction equipment in gravel and concrete systems, control vehicle speed, exhaust gas emission and coal exhaust emission, water the road in construction areas regularly, use liquefied petroleum gas, electricity and other clean energy sources, and strengthen the greening of construction areas and protection for construction workers, thus reduce the environmental impact on air. 2. To set vehicle washing platform at the entrance and exit of material and construction waste conveying vehicles during the construction, materials, the facilities shall meet the following requirements: set water spilling prevention set around the washing platform to prevent the wastewater of vehicle washing from overflowing; set wastewater collection pit and grit chamber.	110	Construction units and project construction units	County Environment Protection Administration, Housing Construction Bureau, Integrated Management Department of

		will have certain impact on the air.	Wash the vehicle at washing platform before leaving the construction site, dust and soil should not be attached to the surface of the vehicles. Material and construction waste in vehicles shall not exceed the height of the vehicle muck along the ledge with a tarpaulin to cover or using a closed bucket.			Township Environment
	Solid Wastes	If the construction wastes, spoil materials and household garbage are not properly handled, it will cause water and soil erosion which will flow into rivers and block the rivers and pollute the water. The stink smell caused by household garbage will easily deteriorate and breed mosquitoes and flies which will multiply bacteria and damage the environment even will release toxic gases.	**Earthwork：** 1. In the starting period of construction, site excavation will be carried out, thus the implementation of the project must take advantage of the natural topography of the gap, try to avoid deep filling. 2. The earthwork excavated out can be used for use of soil in post-period planting project, stonework can be used for basic stone using in building irrigation channels and ditches, avoid random pile of stonework on farmland which will affect the normal operation of agricultural production and irrigation ditches. 3. Arrange temporary earthwork piling site reasonably, keep it away from the surrounding (especially downwind direction) environmentally sensitive sites (farmer household), and carry out pressing, rolling, and felt covering on the temporarily piled earthwork, the soil blocking walls around and drainage facilities to minimize the amount of dust and soil erosion caused by the pile of earthwork. 4. Set stacking drains around the temporary earthwork piling site, and set grit chamber at the exit of the drainage ditch and set in the gutter at the outlet of the grit chamber, so as to slow down the flow of catchment and reduce sediment in the grit chamber. **Construction Waste：** 1. Sort and recycle the recyclable waste comprehensively (sell the scrap iron, scrap steel and material bag to scrap yards, and use scrap bricks for road base material); 2. The waste which can't be recycled should be removed and transported to specified construction waste piling site, during transporting, the construction waste should be sealed to prevent scattering; 3. Measures such as waterproof, windproof etc. should be carried out during temporary piling. **Garbage produced by construction workers：** Build a household garbage site, have someone to clean, collect and sort the garbage every day, and transport the household garbage to the nearby garbage filling site.	55	Construction units, Associate Towns and Villages of the Project	County Environment Protection Administration, Housing Construction Bureau, Integrated Management Department of Township Environment, Health Bureau
	Water En	Random discharge of construction wastewater in which the	1. Wastewater produced in gravel processing: grit chamber + flocculation tank, the treated wastewater can be used for concrete mixing, dust prevention watering, No discharge outward; 2. Watering and cleaning systems in concrete system : sedimentation tank + adding flocculation + reservoir , automatically flow into reservoir after 6 hours' sedimentation and can be used for	110	Construction units, Associ	County Environment Protection Administration,

	vir on me nt	suspended solids have higher concentrations will pollute the river; The wastewater with high concentration will also pollute the river if discharged directly.	concrete mixing, dust prevention watering and other construction dust, No discharge outward; 3. Foundation pit wastewater: grit chamber + flocculation tank, the treated wastewater can be used for concrete mixing, dust prevention watering, No discharge outward; 4. Dry pail latrine for construction teams: household wastewater after disinfection treatment can be used as agricultural fertilizer, No discharge outward;		ate Towns and Villag es of the Projec t	Integrated Management Department of Township, Water Bureau
		Underground water pollution, underground water level drop	1. Intensify observation on the surrounding surface and building settlement condition, once abnormal, underground water pumping and construction should be stopped immediately. 2. In the course of project construction, the construction site should be kept clean; in order to prevent wastewater penetration, wastewater and contaminants should be kept from entering the excavation trench. 3. If oil storage is needed, anti-seepage treatment for warehouses must be carried out, measures must be taken for storage and using to prevent the oil from dripping, leaking, and polluting the water. 4. The temporary garbage storage should be implemented according to relevant anti-seepage measures; prevent underground water pollution caused by dripping and leaking of polluted water. 5. Try carry out the construction in non-flood season, thus to reduce the impact of shallow underground water on construction.	22		
	Sou nd En vir on me nt	Impact on the sound environment of surrounding villages and construction personnel by construction machinery, transport vehicles, gravel processing system	1. Set No hooking warning signs in environmentally sensitive sites of the use low-noise equipment, control noise source, transmission way, traffic noise, blasting noise, equip the construction workers with anti-noise earplugs and arrange construction time reasonably. 2. Arrange construction time according to the requirements of Construction Site Environmental Noise Emission Standards (GB12523-2011), try not to carry out the construction at night or arrange low noise construction at night. Construction machinery (such as hammers) that will cause strong noise should be banned at night (22:00-6:00).If there are sensitive sites nearby, try not to carry out construction at night, or carry out the construction with low-noise, and take measures to reduce the impact of noise on residents to a minimum; Get the approval of relevant departments and communicate with the residents in advance if continuous constructions are needed.	55	Constr uction Units	County Environment Protection Administration, Housing Construction Bureau, the township Integrated Sanitation Management Department of Township

	Impact on social life (such as people's going out, children's going to school, farmers' work in the fields)	Impacts on the traffic： 1. Vehicles which often pass through the construction site should follow a regular route, the vehicles should be washed clean before entering the township roads, materials that are easy to spread and drain should be sealed to effectively prevent dust pollution. 2. Overloading and vehicles with mud and dust on the road are banned to prevent contamination of the road and reduce secondary dust pollution. 3. Have someone to direct the traffic at one-way street and the nearby places around the construction site to prevent traffic jam. Arrange transportation inspector to direct the safe driving of vehicles. 4. Publish relevant construction information in mass media before construction, inform the public of the roads that may have traffic jam caused by construction and give relevant solutions (such as limited release, etc.). 5.Set warning signs such as "Construction ahead, please drive slowly"and "construction ahead, detour" etc. to warn vehicles to drive safely, and will be convenient for residents. 6. Set warning lights in construction section to guide the passing of vehicles in order to at night to reduce the accidents. Landscape Impact: Affiliate work such as cleaning, greening and road restoration etc. should be finished after the completion of main construction work to make it be in harmony with the environment. Heritage Impact: according to the survey on the project surrounding areas no heritage conservation units and distribution sites are found. If new heritage resources are discovered during construction, stop construction immediately and should protect and actively cooperate with the local cultural relics departments for digging work.	-	Construction units, Associate Towns and Villages of the Project	Department of Transportation, Bureau of Cultural Relics, Urban Management Bureau, Integrated Environment Health Management Department of Township, Health Bureau

8.2.2 Environmental impact mitigation measures of road construction project

In addition to common measures in Chart 8.2-1, special measures are listed in Chart 8.2-2.

Chart 8.2-2 List of Environmental Impact Mitigation Measures on Rural Road Construction Projects

Period	Major Negative Impact	Mitigation/Prevention Measures	Investment Estimation (Ten thousand Yuan)	Performer	Supervisor
Design	Impact on the surrounding environmentally sensitive sites of Land occupation	Site Selection： 1. Trying to minimize the new occupation of land, and use the original land as much as possible in site selection. Try to avoid occupation of the basic farmland, fertile soil, forest and nature reserves, scenic spots, forest parks, drinking water source protection areas, cultural relics protection units, historical or cultural sites, villages, schools and other sensitive areas. Maximize the use of the original land, such as carrying out hardening construction in the original road and not occupying land newly.	Having been calculated in design fee	Province, city and County Poverty Reduction Center , Project Construction	County Housing Construction Bureau, Land Bureau, Water Affairs Bureau, Department of Transportation, Environment

	type and wading operations	2. Fully use of the local terrain topography and geology, and avoid worse terrain and the sites that need deep digging, choose appropriate technical standards to ensure linear equalizer. 3. Taking into account the comprehensive management of the mountains, water, land, forest, road and less occupation of farmland 4. The sites selection should be combined with rural planning to avoid demolition and reduce project costs and bring social factors.		Township, Project Village and Designing Department	Protection Administration
Construction	Environmental Impact	Refer to the relevant environmental protection measures in Chart 9.2-1.	/	/	/
Operation	Surface water pollution caused by surface runoff	1. To strengthen maintenance, management, and protection of ditches and embankment slopes, keep the free flow of the road drainage system; 2. To arrange cleaning pavement, keep roads and clean; 3. To arrange the runoff direction of the drainage reasonably, the direct runoff into the ponds, aquaculture and other sensitive water bodies is not allowed.	110（Drainage design included in the project cost）	County Department of Transportation, the township traffic control station	Environment Protection Bureau, the township Integrated Environment Health Management Department of Township, Water Affairs Bureau, the Department of Transportation
	Vehicle exhaust, road dust	1. Strengthen the greening on both sides of the road, enhance exhaust gas absorption, reduce dust and exhaust spreading. 2. Have someone to clean the road, reduce dust by watering, clean and maintain the roads, reduce road dust.	55	County Department of Transportation, the township traffic control station	Environment Protection Bureau, the township Integrated Environment Health Management Department of Township, the Department of Transportation
	Traffic Noise Pollution	1.Set No hooking warning signs in environmentally sensitive sites, set the deceleration strip and green belts, etc., to reduce the effects of noise; 2. Take the measures of greening, sound barriers and soundproof windows constructing to reduce noise for the environmentally sensitive spots that may be impacted by excessive noise in the mid of road operation period in accordance with sound environmental impact prediction.For the excessive noise caused in long-term operation, take regular tracking and monitoring measures to monitor the results and take appropriate measures. The project is located in the rural areas where the settlements of villagers are relative disperse, thus from the viewpoint of environment and economics, soundproof windows are supposed to be set in over-noise spots. the proposed placement of excessive noise sensitive point window. 3. For rural plans, land using on both sides of the roads should be planned reasonably, concentrated residential areas, schools and hospitals which haven't take noise reducing measures should not be built in over-noise areas.	110	County Department of Transportation, the township traffic control station	Environment Protection Bureau, the township Integrated Environment Health Management Department of Township, the Department of Transportation

	Environmental impact caused by transport of dangerous goods and traffic accidents	1. Implementing strictly the regulations about dangerous goods transportation, dangerous goods transporting vehicles must be clearly marked during transporting in order to arouse the attention from other vehicles. Once an accident occurs, call the police promptly and notice of relevant Highway department, fire protection department, environment protection department to take emergency measures. 2. To promote drivers' safety awareness education, strengthen the regulation about transporting of dangerous goods; carry out moral education to reduce man-made traffic accidents. Take effective pollution control measures timely after the occurring of spilling, prevent chemicals from entering into the water in order to avoid water contamination. 3. For the water involved sites like bridge in the proposed construction, set up collision walls on both sides of the bridge, strengthen anti-collision measures to prevent vehicles falling into the water accidentally; 4. To set up no overloading sign and speed limit sign at both sides of the bridge to strengthen the environment protection awareness of drivers and passengers passing by; 5. To set up additional relevant traffic signs in the roads with many sharp turns to alert the drivers to slow down in sharp turns; 6. To strictly enforce Road Traffic Safety Law of the People's Republic of China, work out risk emergency management programs. Pprograms include responsibilities and tasks of the directing agency; choose emergency technical and processing steps; equip and layout the equipments and materials; ensuring and deployment of human and material resources; dynamic monitoring system for accidents and so on.	55	County Department of Transportation, the township traffic control station	County Government, Environment Protection Bureau, the township Integrated Environment Health Management Department of Township, the Department of Transportation

8.2.3 Environmental mitigation measures of water conservancy project

In addition to common measures in Chart 8.2-1, water conservancy special measures are listed in Chart 8.2-3.

Chart 8.2-3 List of Environmental impact and mitigation measures of Water Conservancy Project

Period	Major Activities	Major Negative Impact	Mitigation/Prevention Measures	Investment Estimation (Ten thousand Yuan)	Performer	Supervisor
Design	Site selection of water reservoir and diversion canal and designing	Landscape Impact	Water reservoir and diversion canal take up a small proportion of areas but the number is quite large, meanwhile, they are the nodes in the foundation of landscape and have a larger impact on the landscape. Make the overall landscape design on water reservoir and diversion canal from the aspects of environment protection, greening and comprehensive landscape consideration to harmonize with the surrounding buildings and green belts, beautify rural environment, and pave the way for tourism development led by large-scale agricultural industry.	Having been calculated in design fee	Province, city and County Poverty Reduction Center , Project Construction Township, Project Village and Designing	County Housing Construction Bureau, Land Bureau, Water Affairs Bureau, Department of Transportation, Environment Protection Administration

		Landslides or erosion	1. Carry out geological and geomorphological exploration, choose the appropriate construction technology; 2. Try not to occupy farmlands or forest lands or try to take up a small proportion of them.		Department	
Construction	Foundation excavation, foundation construction, the overall construction	General impact	Refer to the relevant environmental protection measures in Chart 9.2-1.	/	/	/
Operation	Human activities and livestock drinking water safety	People swim in water reservoir or the livestock's falling into the pool and getting drowned	Heighten the wall around the water reservoir, put glass fragments on the top of the wall, prevent humans and livestocks from entering into the pool; build step ladders which will be convenient for management personnel's daily work and rescue work in the pool; strengthen management and advocacy, set up warning signs to prevent security incidents.	22	Province, city and County Poverty Reduction Center , Project Implementation Township and Project village	County Government, Environment Protection Bureau, Integrated Environment Health Management Department of Township, the Department of Transportation

8.2.4 The environmental mitigative measures of non-linear infrastructure projects

Environmental impact and mitigative measures during construction in the construction such as trading market, product storage and processing sites, mainly refer to table 8.2-1, on the specificity of the project and specification in the table 8.2-4.

Table 8.2-4 The list of the environmental impact and mitigative measures of Non-linear infrastructure projects

Phase	Main negative effects	Mitigative/preventive measures	Investment（ten thousand Yuan）	Performer	Supervisor
Design phase	Stench and noise	1. Livestock and poultry trading place should be set at the downwind, and other trading market should be furnished separately, and away from surrounding environment sensitive points, to reduce stench impact on the surrounding environment. 2. The livestock and poultry trade point should be around to land-use planning, it is not appropriate and focused on residential areas, places of entertainment, and so on.	Included in the cost of design	Province, city and County Office for poverty alleviation, project townships and villages, and design units	Housing Construction Bureau, Land Bureau, the Bureau of animal husbandry

	Excrement and sewage, dining oiliness sewage	According to the current situation, market position is uncertain, and the periphery does not have matched utilities and auxiliary facilities, the EIA recommend each region can according to the construction of the market scale, rationally configure sewage treatment facilities. Market smaller and less waste water discharge, the surrounding farmland, woodland can be treated by septic tank used for farmland irrigation and fertilization, for wastewater irrigation should meet the "standards for irrigation water quality" (GB5084-2005) requirements; market scale is larger and sewage emissions more, don't have farmland irrigation condition at the surrounding of the project, relevant departments in the district should dispose the corresponding sewage treatment station, reach the life, production sewage treatment discharge standards. Restaurant wastewater containing oil, oil separation treatment should be carried out before treatment; livestock and poultry manure should firstly dry separation, then carry out livestock wastewater treatment. The market should has a public toilet, septic tanks, sewage pipes and the treatment pool, or involved in the municipal pipe network etc..			
Construction period	Negative effects see Table 8.2 - 1, refer to Table 8.2 - 1 the relevant environmental protection measures.		/	/	/
Operating period	Effect of waste gas and stench on the ambient air	1. Exhaust gas from farmers market: take the natural ventilation and indoor ventilation, strengthen air circulation of farmers market shops; timely remove solid waste generated, strengthen shop health management, reduce waste generation. 2. Automobile exhaust: strengthen the traffic management, reduce the idling speed and take other measures, reduce automobile exhaust volume. 3. Catering fume: in the dining area where the building should be reserved centralized flue, only after at all catering area waste gas must be treated by purifying device and cool to remove oil can discharge at the roof; dining area and oil fume discharge port whose distance from the sensitive buildings should meet the "catering industry environmental protection technology standard" (HJ554-2010) related terms. 4. The odor pollution control: ● set refuse collection point, the project property management department assign the special person responsible for the cleaning and spray disinfectant, timely delivery to the municipal garbage station, reduce the generation and emission of the stench of garbage; ● strengthen greening, livestock trading place surrounding can be planted shrubs, pine trees, reduce the odor pollution; ● the timely liquidation of livestock and poultry manure, regular cleaning of pens, strengthen sanitation management and ventilation , to reduce the odor impact on regional environment; ● use deodorant, reduce the odor source. ● strengthen market sanitation management and ventilation measures on manure storage, strengthen the process control and transportation management, reduce the waste of storage, and the sealing cap and vacuum deodorization isolation, in order to reduce the odor impact on regional environment.	220	Property management of the business district	County Environmental Protection Bureau, the township environmental comprehensive management department, Health Bureau, industrial and Commercial Bureau

	Waste water discharge influence on surface water	1. Market position is uncertain, and the periphery does not have matched utilities and auxiliary facilities, if the market is smaller and less waste water discharge, the surrounding has more farmland, woodland should be treated by septic tank used for farmland irrigation and fertilization, for wastewater irrigation should meet the "standards for irrigation water quality" (GB5084-2005) related requirements; market larger and sewage emissions more, surrounding the project does not have the conditions of irrigation projects, relevant departments in the district should dispose the corresponding sewage treatment station, discharge until reach the life, production waste water treatment standard. 2. Restaurant wastewater containing oil, oil separation treatment should be carried out before treatment; livestock and poultry manure should first dry separation, the livestock wastewater treatment. 3. In view of the livestock and poultry manure produced should be properly handled. For not timely removed, should set up a special temporary stacking place, set up tarps, and take control measures, in the summer should be regularly spraying disinfectant on the stacking place. At the same time livestock and poultry feces temporary stacking place reasonable decorate, away from the surface water and residential area and other environmentally sensitive point.	330	Property management of the business district	County Environmental Protection Bureau, the township environmental comprehensive management department
	Commercial operation, livestock trade, catering activities of noise	1. Commercial noise: through the reasonable arrangement of the location of shops, keep enough distance and households in the design, to take measures to strengthen the internal insulation, the surrounding green belt cutting noise; establish a strict management system, to prevent the commercial noise, such as the prohibition of loudspeakers publicity selling etc.; 2. The noise of vehicles: parking the vehicle to take no honking, minimize the frequent starting and idling vehicles. 3. Equipment noise: selection of low noise equipment, for the high noise equipment should adopt the installation muffler, sound insulation cover, sound insulation, shock absorber etc. shed noise reduction, prevention and control of noise pollution. 4. The cattle call: reasonable arrangements for livestock feeding, to avoid large-scale source of noise generated by starving livestock; take the necessary insulation measures in the livestock captive interior, such as the installation of sound insulation windows, reducing noise pollution.	110	Property management of the business district	County Environmental Protection Bureau, the township environmental comprehensive management department, industrial and Commercial Bureau
	Solid waste	1. Livestock and poultry manure: strengthen management, timely collection, comprehensive utilization in the farmyard manure, biogas, fish, no more than row. In strict accordance with the livestock and poultry manure collection, storage and transportation requirements of aquaculture projects in the collection and transportation. 2. Life garbage: ● living garbage generated by the little bag collection and then transported to the garbage collection pool, collect evacuation township near the landfill unified disposal; waste collection pool closed set, the person is responsible for the cleaning and spray disinfectant, timely delivery to the municipal refuse collection points, to reduce the generation and emission of the stench of garbage; ● office garbage should not be mixed with domestic waste, which may contain waste toner cartridges, scrap batteries, should be separately collected, in order to avoid the pollution of heavy metals in soil and	110	Property management of the business district	County Environmental Protection Bureau, the township environmental comprehensive management department, health

		groundwater; ● kitchen garbage and waste oil produced by the catering establishments, can refer to the implementation of "technical specifications" food industry related to environmental protection requirements, send the kitchen garbage and waste oil to qualified units or collected by farmers in the vicinity to be used for livestock feed.			department, sanitation department, industrial and Commercial Bureau

8.2.5 Environmental mitigation measures of agricultural planting project

Table 8.2-5 List of Environmental effect and mitigation measures of Agricultural planting project

Phase	Major nagtive effects	Mitigative /preventive measures	Investment (ten thousand Yuan)	Performer	Supervisor
Life-cycle process	Effect of pollutants by burning byproducts generated on the atmospheric environment	1. The use of bio fuels to replace fossil fuels, to reduce greenhouse gas emissions; 2. To avoid burning straw or other organic matter in the land to reduce particulate matter emissions, while maintaining the organic matter content of land, the land in the land leveling from wind erosion; 3. To avoid the use of open burning process of pesticides and other agricultural wastes;	11	Province, city and county poverty alleviation center, project implementation rural and project village	Comprehensive management departments of rural environment, County Environmental Protection Bureau
	Poor land management, excessive close planting, intercropping, resulted in soil degradation and soil loss	1. Suitable for planting crop adapt to the local climate and soil conditions; 2. In the steep slope area should be determined according to the topography, planting and cultivation direction, in order to avoid the loss of soil and water by precipitation or irrigation; 3. The appropriate machinery, to prevent the soil compaction caused by heavy equipment; 4. The use of vegetation coverage, intercropping or protective forest such as ways to reduce wind and heavy rain caused by soil erosion; 5. Through the use of crop residues, compost and manure and other organic material to increase the content of organic matter in soil, in order to protect the soil from sun, rain and wind erosion, and maintain the soil ecosystem. But in the application, should give full consideration to the possibility of the spread of diseases and insect pests; 6. Considering adding lime to the soil, soil acidification in controlled by acid deposition or apply fertilizer caused, the soil to maintain a stable pH; 7. In the use of manure and sewage sludge and other waste reinforced soil, should be evaluated for their potential effects on Soil and water, this is because of which may contain some pollutants (such as heavy metals, nitrogen, phosphorus and pathogenic substances).	55	Province, city and county poverty alleviation center, project implementation rural and project village	Bureau of planning and construction , agriculture and animal husbandry bureau, County Environmental Protection Bureau, the comprehensive management department of rural environment, geological disaster management department
	The fertilizer is not reasonable utilization lead	1. As far as possible the use of organic fertilizers instead of chemical fertilizers; 2. Organic manure used as fertilizer, reduce the loss of fertilizer, effectively and improve soil fertility, enhancing crop quality, achieving crop security and the strategy of sustainable	110	Province, city and county poverty alleviation center,	County Environmental Protection Bureau, the comprehensive

	to eutrophication	development of agriculture, fertilizer use with farmyard manure, improving nutrition, improve soil fertility, reducing fertilizer costs, increase the effectiveness of fertilization to improve crop yield and quality, to reduce environmental pollution; 3. "Added fertilizer irrigation" can be used in horticultural production, , refers to a small amount of fertilizer added to the water for irrigation. This approach requires detailed management is commonly used in production of greenhouse, using appropriate technologies and equipment for spraying fertilizer; 4. Crops, and forest fruits and legumes (green manure crops), and intercropping intercropping and crop rotation, reduce fertiliser usage, improving fertilizer efficiency; 5. According to the crop and soil conditions, nitrogen, phosphorus, and potassium is used proportionally, bearing in mind the application of trace element fertilizers, balanced supply of nutrients, give full play interaction between fertilizer; 6. Before fertilization, manure nutrient content, solubility, acid and alkali, side effects, interactions of fertilizer mix and other factors to take into account, to maximize the economic benefits of fertilizers; 7. Before fertilization, such as soil organic matter and soil nutrient status, soil texture, soil pH, soil fertility levels were measured on the soil character, choosing the appropriate fertilizer varieties, determine the reasonable fertilization method; 8. To improve the fertilization techniques, improve fertilizer utilization rate. One, should follow “control nitrogen, reduce phosphorus, increase potassium” the principle, two is the improvement applies fertilizer method, the key is promote nitrogenous fertilizer to execute deeply, the phosphate fertilizer moistens the rice shoot root and other concentrated application of fertilizer technology, as well as in terms of the earth and the crops to apply fertilizer technology, promotes measured soil and graduate to apply fertilizer, the nutrition diagnosis apply fertilizer and other the scientific reasonable apply fertilizer technology.		project implementation rural and project village	management department of rural environment, agriculture and animal husbandry bureau
	Irrigation, the impact on water environment	1. When River irrigation using surface water diversion, diversion layout should be demonstrated by fisheries management, marine safety supervision and management departments, and other relevant departments to ensure that the water diversion project will not affect fish "three" Habitat, and ensures channel a natural passage. 2. In the plant processing to increase research and reasonable application of water-saving irrigation techniques, vigorously promote the use of water for economic micro-irrigation technology, reducing the volume of irrigation water; 3. Rational exploitation of water resources in irrigation districts, optimum height, increase water resources utilization, maintain water resources balance; 4. To make scientific use of water systems, according to the growth and development of crops, crop evapotranspiration and soil moisture, and precipitation distribution, make	55	Province, city and county poverty alleviation center, project implementation rural and project village	County Environmental Protection Bureau, the comprehensive management department of rural environment, agriculture and animal husbandry bureau

		effective water use and water allocation plan. Distribution precision should reach more than 95%, so that does not produce water withdrawals for irrigation as a standard to prevent deeper due to excessive irrigation and overexploitation of groundwater and leakage and contamination of groundwater; 5. Building strictly for facility management and maintenance system, periodic check health facilities, guarantee the good functioning of the various water-saving facilities; 6. Rational close planting and increasing land cover in order to reduce soil bare area and time, inhibit soil moisture from increasing and returning to salt and increase soil desalination.			
	Effects on Biodiversity	1. As much as you can reuse the soil surface residues of the previous crop. Before you implement this method, consider the potential spread of pests and diseases; 2. Reducing the formation of land to maintain the structure of soil ecosystem; 3. Regularly monitoring soil health, for example, can be based on macro-biological indicator species, such as the number of earthworms, to determine the soil biomass; 4. The use of certified seeds, the seeds do not contain exotic invasive species, and its diameter and species consistent with the information on the packaging; 5. In order to accommodate the predators of pests and ensure that it provides favorable Habitat, such as hedges, nesting sites, and native vegetation; 6. To promote the use of organic products as much as possible. 7. Workers in the wild is strictly prohibited from littering, to handle the refuse collected regularly. For example Gastrodia elata cultivation requires backfill and soil compaction after digging, also timber saplings planted in the pits, not only erosion control but also revegetation. Bacterial material purchase is strictly forbidden to purchase severed trees, only branches. Increased timber species age diversity studies through the establishment of bacteria, mix forests of artificial planting of pluralism, the combination of different tree species to solve the sources of bacteria due to the tianma industry expansion resulted in material shortages.	22		
	Pollution from pesticides and pesticide use	1. Alternating crops to reduce pests, diseases and weeds in the soil ecosystem, using mechanical or thermal weed control methods to control weeds; 2. To choose disease-resistant insects, seeds, seedlings, when introduction for seeds, quarantine seeds and seedlings to prevent the spread of diseases and pests, by cultivation measures to enhance the ability of plant resistance to pests and diseases, pests and back as far as possible with physical methods (removal of diseased plants , people snap, lights, etc) in order to achieve the aim of applying less pesticides or pesticide is not used; 3. To support the use of biological control of pests, such as insects, birds, mites and useful microbial biology;	55	Province, city and county poverty alleviation center, project implementation rural and project village	County Environmental Protection Bureau, the comprehensive management department of rural environment, agriculture and animal husbandry bureau

		4. Using animal grazing to remove weeds and control of vegetation cover, using mechanical methods such as traps, barriers, lighting and sound to eliminate, evacuate or dispel pests; 5. Lower use of chemical pesticides, advocate biological control, agriculture prevention and integrated control, recommend the use of low-toxicity pesticides, control the use of toxic pesticides, prohibit the use of highly toxic pesticides, prohibition of the use of the national list of prohibitions and restrictions on the use of pesticides ; 6. Strengthen pest surveillance, provide scientific basis for Orchard pest management through technical training and equipment, promote green pest control and residual pesticide reduction technology; 7. Pesticides stored in its original packaging, placed in a special, cool and dry, no frost and ventilated places, locks and make obvious mark you want, authorized personnel only can access. Ensure that human or animal food is not kept in the same location. The storage site should be designed leakage control measures, and site selection should take into account the potential for contamination of soil and water resources; 8. Ensuring when pesticide use ,wear protective clothing after washing or disposed of in an environmentally responsible manner, at the time of the use and storage of pesticides, use groundwater supply to prevent water reflux, insist recording pesticide use and its effectiveness.			
	Crop residues and other solid waste	1. Remaining crop residues and other organic matter in the land to plow or compost in order to recycling. Before the implementation of these measures, the possibility should first take into account the potential spread of pests and diseases; 2. To make crop residues as energy fuel of biomass energy facilities, fermentation substrate of equipment, and raw material of biorefinery; 3. Cleaning (such as three washing technology) and treatment (for example, by grinding, cutting, or return to the supplier) pesticide packaging and containers, to avoid it to be used as food and drinking water containers. According to the provisions of the solution for cleaning, recycling reuse as diluent, or storage and final disposal; 4. For the overdue and excess pesticide, shall be treated in accordance with the management plan expired guidelines and excess pesticide.	11	Province, city and county poverty alleviation center, project implementation rural and project village	
	Pollution from agricultural films	1. The appropriate period of uncovering film: uncovering film is after modified crops for harvesting, the film uncovering time, the best selected for early morning rain sunny or moist soil, suitable to film, can reduce the residual in the soil of plastic sheeting; 2. Taking artificial and mechanical recycling measures combining, increase recycling efforts to residual plastic film: in addition to the head of Film Uncovering measures, also organize labor to recycle plastic film residue by hand or by plastic film recycling rake, before land leveling, sowing and after harvest use plastic film recycling machine also can receive the	11	Province, city and county poverty alleviation center, project implementation rural and project village	County Environmental Protection Bureau, the comprehensive management department of rural environment, agriculture and animal

		good effect; 3. Optimizing cultivation system: strengthen crop rotation system, through crop rotation reduce film per unit area coverage, and reduce the residual membrane pollution.			husbandry bureau

8.2.6 The mitigation measures for the environment of the breed aquatics project area

Table 8.2.6 The schedule of the project environmental influence and mitigation measures for the environment of the breed aquatics project area

phase	the major negative impacts	mitigation/prevention measures	Investment (10 thousand)	Executor	Supervisor
Siting and designing	The atmospheric influence and surface water influence	1. To prohibit siting and constructing in the drinking water source protection area, plaecs of interest, the center and buffer zone of the nature protection area; 2. To prohibit siting and constructing in residential area of the town, area for culture and education and scientific research, area for medical treatment, commercial area, industrial zone, tourism area, and other suchlike population concentrated areas; 3.The pollution treatment project of breeding industry of livestock and poultry should be a defending distanct away from the livestock farm production area and residential area and other suchlike buildings, defining in the downwind or sidewind of the dominant wind; 4.The breeding area of livestock and poultry should be equiped respectively storage devices for liquid and solid waste and the storage pool for the excrement of livestock and poultry should be more than 400m away from the earth's surface water; 5.The sties should be designed in solid-liquid waste ways that is convenient for water cleaning and separating the dry waste from the urine, and convenient for pollution treatment; 6. The devices used for separating solid-liquid waste and anaerobic zero emissions: A. The excrement(solid waste) collected and stored to produce commercial organic fertilizer; B. The urine and wash water into the anaerobic digestion process system, treated to produce biogas, the biogas being used for heat supply and the rest remaining liquid for woodland and farmland fertilization.	reckoned in the design cost	the Province Development-oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	Planning and Construction Bureau, Land and Resources Bureau and Forestry Bureau
operation	The atmospheric environmental influence from the stench, greenhouse gases and ashes	1.Siting for new devices ought to make allowance for the distance to the neighbors and the emission problem of foul smell; the temperature and humidity and other suchlike environmental factors of Livestock manure storage should be well controlled; dischargings and emissions should be reduced and the sties should be cleaned periodically clearing away in time; In consideration of reduction of the emission of foul smell when collecting manure from excrement of livestock and applying the manure to the farmland, some specific measures should be considered to take, for example, fertilizing several cm and in the right weather (e.g., in the opposite wind direction to the residential area, etc.) 2. Using deodorant. Adhibit some types of mingled forage mixed of straw and effective	55	the Province Development-oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County	the County Environmental Protection Bureau

		micropopulation and compound microorganism bacteria agent: the effective micropopulation and compound microorganism bacteria are cultivated by combounding 10 genuses, more than 80 kinds microorganism, such as photosynthetic bacteria, actinomycetes, microzyme, lactobacillus, etc.; The animals fed this type of forage produce less excrement, therefore, this method may greatly reduce the emission of contamination and the production of foul smell. 3.Adhibit balanced ways of raising, increase the proportion of carbon and nitrogen in the forage, decrease the output of methane and nitrogen oxide; 4、The devices used for separating solid-liquid waste and anaerobic zero emissions: A. The excrement(solid waste) collected and stored to produce commercial organic fertilizer; B. The urine and wash water into the anaerobic digestion process system, treated to produce biogas, the biogas being used for heat supply and the rest remaining liquid for woodland and farmland fertilization. 5. The measures taken in different kinds of pastures/grazing management to decrease the output of nitrogen oxide and methane include: avoiding building surplus meadows, avoiding grazing in late autumn and late winter, improve the drainage situation of the soil, avoiding the soil compaction because of grazing(this is to keep the anaerobic soil; 6.Install dust collection equipment in the workplaces with a lot of ashes(e.g. grinding place of the forage) to prevent from overspending meadow production to feed the livestock, carry out the controlling measure of the rising ashes, for example, often sprinkle water on the earth roads used frequently.		Development-oriented poverty Alleviation Center, the project town/township and village	
	The environmental influence resulted in from production waste water	1. Adhibiting well-conditioned and well-maintained automatic drinking apparatuses to prevent the drinking water flowing from the tank and to reduce the drinking quantity and the spill; 2. To construct buffer zones in the spot and nearby to prevent the livestock excrement from scattering in this area, intercept the solid sediments by using vegetational filtration and channel the clean runoff flow to run away from the waste piled area; 3. The waste water from breed aquatics, after septic tank treatment, can be carried by manpower or by pipeline transportation to the farmland for irrigation; the environmental protection apraisement advise constructing livestock and poultry waste water storage ponds and that would be convenient for irrigation. 4. While pretreating the urine of livestock and poultry for irrigation in the farmland, strictly prohibit flooding ways, instead, adhibit drop irrigation or sprinkling irrigation in order to avoid diffused pollution of the soil and the surface water, what's more, avoid too frequent irrigating the same plot in a short period.	22	the Province Development-oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau
	The	1.The breeding area, in designing, is sited reasonablely and kept away from the concentrated	11	the Province	the County

	environmental influence resulted in from livestock cry	residential area to prevent the noise from troubling the neighborhood; 2.Reasonablely planing and arrangement of the livestock food intake, avoid the wholesale concentrated noise source from the livestock because of hunger; 3. To captive chambers should be treated by taking some sound insulation measures, for example, install sound insulation doors and windows, etc..		Development-oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	Environmental Protection Bureau
	The environmental influence around resulted in from garbages	1.Keeping the purchasing records and using records to facilitate the storage, transportation and using of the forage more high efficiently, use capped feeding devices or those with protective equipments to avoid erosions from wind and rain, keep the feeding system in good operating mode to prevent the forage from overflowing or touching the ground, according to what extent each way may influence on the air, soil, surface water and the groundwater, decide whether or not use the waste forage and other recyclable materials as fertilizer, or treat them in ways of burning or burying, etc; 2. To choose the suitable forage substance according to the nutrition requirement in different stages of production and growth, adhibit low phosphorus forage and high quality forage and pollution free forage, grind the forage to increase the digestion rate and reduce the consumption of the forage, thus decrease the livestock excrement and facilitate the production of livestock simultaneously; 3. The place for the storage of livestock excrement should be kept far away from the water body, alluvial plains, water supply source, etc. suchlike sensitive habitat to decrese the surface area of the place for the storage of livestock excrement and ensure the production facility and place for the storage of livestock excrement put together, try to keep the waste dry and convenient for abrasion or clashing and abrasion, instead clashing alone, to reduce the quantity of water to be used, prevent animal urine and excrement pollute the surface water and groundwater; 4.Keep the livestock excrement surface temperature under 15℃or below(e.g., cool the surface of the livestock excrement) in order to decrease the emission quantity of the ammonia gas; 5. Ensuring that the collection of solid waste are conducted periodically (e.g., matting material and manure), prohibit remaining on the ground for a long time or using as farmyard manure.	33	the Province Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau

	The environmental influence around resulted in from animal carcass	1.Taking some appropriate caring and disease prevention measures to decrease the animals' death rate, the farmer must inspect the livestock everyday and report to the veterinarian at once if finding animals die of disease; 2. The carcases must be collected and preserved and all the animals dying of disease mustn't be sold, eaten or thrown away anywhere, but should be refrigerated to avoid corruption, if necessary; 3.The common animals dying of disease must be delivered to the veterinarian office for the veterinarian In the field to inspect, autopsy, or inspect chemically, report to the correlate functionary and appealed to the local veterinary administration section to assist to the farmer in handling if find any doubtful violent infection cases, As for the suspected infection cases or the cases of the suspected anthropozoonosis, dissection must be prohibitted, the carcases must be buried deeply, animals die of disease must be recorded, the autopsy animals dying of disease must be put in the autopsy record and assay record. 4. As the project lies in the rural area and belongs to scattering breed aquatics, there is not burning condition, so adhibit the way of burying to deal with the animals dying of disease, two safe burying pits should be required in this project, each time after burying, covered with a layer of more than 10cm white lime, and after filling, use clay cover up and consolidate and finally seal the inlet.	22	he Province Development-oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau
	The environmental influence around resulted in from hazard materials	1. Effectively administrate the architectural construction to avoid pest breeding(e.g., blank off the leaks, seal the cracks of the doors and windows), use mechanical controlling means(e.g., catchers, roadblocks, lighting, sounds) to kill, migrate or drive away pests, of course, adhibit natural enemies to control pests, supply favorable habitat(e.g., the nestable brushwood and other original vegetation in which the natural enemies of the pests can hide) to protect the natural enemies; 2. Sties must be managed well, limit the source and habitat of the pests, improve drainage system to reduce seeper in order to control the number of mosquitos, consider using woven geotextile to cover livestock excrement piles(allowing water to enter the manure to maintain effect of the dunghill at the same time), thus decrease the number of flies; 3. If there is the necessary of the use of insecticide, state it clearly, analyse the effect and the potential environmental influence of the insecticide to ensure the choice of insecticide has the least harm; 4. Train missionary use insecticide according to the process planned beforehand, and wear necessary exposure suit; if feasible and necessary, the missionary applying insecticide must obtain the specific certification, search the information of the manufacturer for the upper limit and dosage of the insecticide and relative recommendation, and refer to publicity data about how to reduce the dosage of the insecticide without the efficacy; 5. Avoid using the insecticide with the danger levels ranked 1a and 1b in World Health Organigation Recommendation on Insecticide Classes, avoid using the insecticide with the danger	44	the Province Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau

		levels ranked II in World Health Organigation Recommendation on Insecticide Classes, and avoid using the insecticide listed in the appendix A and B of Stockholm Treaty; 6.Using only the insecticide that manufactured by the manufacturer who have the license and are approved by appropriate authority after registration examining and approving and in accordance with the criteria of the International Conduct Regulations of Selling and Applying of Insecticide by Food and Agricultural Organization, use only the insecticide labeled according to the international standard and criteria (e.g., Food and Agricultural Organization A guide on How to correctly Label Insecticide, revision; 7. Using only the applying technique and methods that can reduce the non-deliberate drift or non-deliberate flow, applying uder the controlled condition; 8.To keep the insecticide in the original wrappage in the dry, cool, frost-free and well-ventilated special place which only the licensed person can be permitted into, prohibit putting mankind and animal food in such place, the work of mixing or shifting the insecticide must be completed by bridle-wise staff in designated exclusive containers and under the well-lighted and well-ventilated conditions, these containers should not be used for other purposes and be managed as hazardous waste according to the General EHS Guide, cast off the moistened or stained containers according to the Food and Agricultural Organization guide and the specification of the manufacturer; 9. The insecticide purchased and stored should not outrun the required quantity, the management of insecticide must obey the first in and first out rule to avoid the insecticide out of date, and keep the record of the insecticide applying and efficacy.			
	The ecosystem environmental influence	1.Preventing animals from approaching the surface water body by using rails, buffer zone and other roadblocks; 2. Before transforming farmland to plantation, specifically survey the project area in order to identify, differentiate and describe the natural the types of habitat and reconstructed habitat and make certain the value in its diversity in the project area and in the whole country; 3. Ensuring the natural habitat planned to transform into reconstructed habitat and reconstructed habitat, don't involve any pivotal habitats including the known habitats that there exsit critically endangered species or that in imminent severe danger, or the important wild animals' litter area, feeding area and concentrating area; 4. To notice the critically endangered species or that in imminent severe danger in the area used for livestock raising, and make allowance for these species in the management process, provide to the best of the abilities to avoid disturbing the area nearby; 5. To feed the flocks and herds with the straw of food crops while using the excreta of the livestock as organic fertilizer applied into the soil to increasing of soil fertility thus form a good ecological cycle to the benefit of the agricultural development;	11	the Province Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau
	The animal	1. To control the animals, equipments, personnels, wild animals, and livestock that are involved in	22	the Province	the County

	disease influence to humanbeings	the raising system(e.g., take medical inspection and isolation to the newcome animals, clean and disinfect the cargo boxes, disinfect and enclothe the shoes of the missionary before they enter the livestock area, provide the missionary with protective clothing, seal the leaks and holes to avoid wild animals entering); 2. Taking specific preventing measures to the automotive vehicles running in the livestock farm(e.g., pick up the veterinarians, raising products suppliers and the cars of the products buyers, etc.,), for example, restrict the these automotive vehicles to run in the specific region, and take biological safe measures and spray disinfection to the tyres of the automotive vehicles and parking lot with disinfectant; 3. Dsinfecting the animals' sties; 4. To find out and isolate ailing animals, make management procedure for removing and dealing with the dead animals; 5. To employ only the specially trained and qualified professional professional to repair or maintain and/ or to dismantle the liquid state Livestock manure storage devices, and they must obey the regulations of entering the narrow space, including using personal safety appliance(e.g., air supplying breather apparatus, etc.); 6. Contriving to add fence, inlet or outlet and tilted trough and some suchlike devices in order to lead the animals action and reduce the frequenc in and out of the missionary, train the missionary take care of the livestock in correct ways, decrease the chances to be bit or kicked by the animals;		Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	Environmental Protection Bureau, The County Environmental Protection Bureau, the Town/Township Comprehensive Managing and Controlling Department, Animal Husbandry Bureau, Sanitary Bureau

8.2. 7 The mitigation measures for the environment of the product processing area

Table 8.2-7 The schedule of the environmental influence from products storing and processing project and the corelative mitigation measures

phase	the major negative impacts	mitigation/prevention measures	investment(10 thousand)	executor	supervisor
The whole industry processing course	The influence of pollutants from the processing course on to the atmospheric environment:	The project planned to be implemented in this plan are all not applicable for using coal burning boiler, the staff should use electricity , gas gasoline, etc., and other suchlike clean energies, therefore, in this project, the prevention and control measures for the atmospheric environment pollution are as follows: 1.Walnut processing enterprises ①the ashes resulted in from rinding in the pretreatment workplace: rinding walnuts may produce a spot of ashes emitting in diffusing directions, in accordance with the ashes produced this section, the environmental protection apraisement requires the workplace be installed with vent fan and be enhance the ventilation; as the size of the project is small and the production of the ashes is not large, adhibiting the above measures can make dust concentration of the ashes in the workplace reach the the criteria for emitting in diffusing directions of Airborne Contaminants General Emission Standard，GB16297-1996；	33	the Province Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center,	the County Environmental Protection Bureau and The County Environmental Protection Bureau,the Town/Township Comprehensive Managing

		②The irritant gas in from the squeezing workplace: the lixiviating process of this project is operated in the obturated space, the major components of the dissolvent are normal hexane and cyclohexane, as the dissolvent is volatile and has thick irritant smell, so as long as leaking out occurs, the concentration of organic solvent in the air will rise for some extent and thus brings pollution to the environment and influences the workers' health; The environmental protection apraisement requires the daily management and maintenance of the fabrication facilities be enhanced, keep the leacher, the dissolvent turnover tank and other suchlike appliance safely operating, avoid the dissolvent gas overflow, ensure the normalization of the commodity processing and the physical and psychological health of the workers; ③Deodorized exhaust gas: The deodorization process produces mainly light fraction in the grease, much of the overhead product(99%) can be recycled by using condensating withdrawer, and the rest(not condensated)fraction comes into the cooling column with the aqueous vapour and finally discharge into the air; ④The stink from the product line: In this project process, the stink comes mainly foots oil pond and waste clay field and other suchlike places, the measures planned to take in the enterprise mainly include: periodically clean and remove the foots oil in the foots oil pond and the waste clay from the waste clay field to avoid the above materials depositing for too long resulting in the growth of bacteria and stink; enhance the product control to avoid the four phenomena: fleeing, emitting, dropping and leaking in the producing process; 2.Forage processing enterprises The forage project produces much ash nearly involving each and every production process; An anti-subpulse cloth bag duster should be installed in the workplace to deal with the cooling wind with the efficiency of dust collection of 99%, the waste gaseous effluent emits up to standard from the 15 meter tall exhaust funnel after treatment ;after cooling ,the finished product rock processing produces mainly the raw material ashes; the ashes in the stage is all inducted into the ash separator to be treated and then emits up to standard. 3.Organic fertilizer processing enterprises As the stench gas produces in the pre-mix room, ferment room and finished product storage room of the production process, so the treating measures should be worked out; it is recommended that the project should install induced draft fan in the workplace to induct the stench gas into the adsorption plant fully loaded with active carbon, exploiting the active carbon to adsorb the malodorous gas and the treated gas emits from the main outlet; Because of the complex the landform around, in this phase, the environmental protection appraisement requires the treated malodorous gas emit from the exhaust funnel with the height of not less than 25m; As for the malodorous gas emitting in diffusing directions, in this project production process there		the project town/township and village	and Controlling Department

		is a little malodorous gas effuses into the ambient air, and the entering or outing out of the workplace of the workers working in this stage results in the a little effusion of the malodorous gas; Such effusion is inevitable, so the enterprise is required to take some measures to reduce the quantity of the malodorous gas emitting in diffusing directions to the minimum, the concrete measures are as follows: clear away in time the fowl manure scattering in the workplace, periodically sprinkle acid phosphate and ethanoic acid etc., and other suchlike deodorants in the workplace, i.e., once each day or as appropriate, the fowl manure must be covered well in the process of transportation to avoid leaking out in the process of transportation, at the same time, the surfave of the fowl manure should be sprinkled with acid phosphate, ethanoic acid, etc., and other suchlike deodorants reducing the emission of malodorous gas in the process of transportation. 4. The slaughterhouse ①Constructing a 5 - 10m greening isolating zone in the yard, to the best of the abilities to reduce the stench influence on to the outside environment; ②In this project, the livestock excrement, the things in the stomach, dogmeats broken bones and other suchlike waste, either in waiting lairage or in the workplace, should be cleared away in time; ③As the density of live pips in the waiting lairage is too big, so, the times of ventilation should be increased to remove the malodorous gas; ④In the slaughter workplace , in the process of paunching and extracting the guts, the times of ventilation should be increased to remove the malodorous gas; ⑤In this project, the ground of the slaughter workplace and the ground of the waiting lairage should be cleaned in time, and the ground should be paved a layer of impervious materials which can be used prevent blood and the surface of which should be resistant to mechanical damage and kink of antislip; ⑥The ground of the slaughter workplace and the waiting lairage should be designed with a slope of a general 1.5% - 3% , and with drains covered with gridirons convenient for cleaning the ground and drainage; ⑦To install the deodorants in the exhaust gas system; ⑧After taking all the measures above the stink still influences the residents nearby, it is proposed to collect the effusing malodorous gas and spray naturally extracted deodorant on to the ground in atomizing way with the Canadian biological deodorization technique, thus the deodorant reacts with the H2S, NH3 and amine and other suchlike things in the effusing malodorous gas in the air, in this way to remove the malodorous gas. After taking all the environmental protection measures above, the level of the stink in the workplace and the waiting lairage can be reduced to 1-2 levels, this has little influence on the			

		environment around. 5.The fresh-keeping refrigerated storage 1)To shorten the storage period of the soled waste and keep the device working under some negative pressure to avoid peculiar smell emitting in diffusing directions, and periodically inspect the cooling and refrigerating apparatus and monitor the consumption of the cold producing medium; 2) To enhance the daily management and maintenance of the production facilities, keep the leacher and the turnover tank, etc. , operating safely ot avoid dissolvent gas overflowing and ensure the physical and psychological health of the workers. 3) In the refrigeration workplace, the ammonia gas leaking mainly the refrigerating system, the cold producing medium in the refrigerating system is liquid ammonia and the refrigerating cycle completes by single-stage compressing ammonia and direct expanding vaporing, condensation temperature is 40℃ and evaporating temperature is 70℃, Technological process: low-pressure ammonia gas is compressed into high compressed steam by the compressor and the it is oil separated and cooled down and condensated into high pressure liquid ammonia by condenser, finally into ammonia storage, the high pressure liquid ammonia from the ammonia storage is supplied to the refrigerant condenser and throttled and expanded and then it evaporates and is withdrawn to the compressor by the suction pipe, it cycles like this; The oil outletting and the air outletting from the ammonia equipment will let a tittle ammonia leak, accouding to stipulation of the national environmental protection department, the highest concentration of ammoniac in the production department is 30mg/m3, adhibit seedy bottle sampling and colorimetry technique to examine periodically the concentration of ammoniac, when the ammonia gas in exceeds standard, adhibit forced ventilation and ventilation to reduce the ammonia gas concentration in the workplace; The engine space should be installed with ventilator switch bottons, and the refrigeration workplace equipped with respirators, and high-low voltage installations, provided relief door, and the daily coerced ventilation rate is set up for >=8 times; 4) To enhance the risk prevention of liquid ammonia, establish risk prevention contingency plan to avoid happening the hazard accidents and ensure the normal production and life. 6.The tea processing enterprises The waste from the this project is mainly the tea dust and ash from the production process, and the tea dust and ash can be collected by a dusting machine train and has less influence on to the outside environment.			
	The influence of pollutants	All the processing enterprises in this project carry out rain-sewage diffluence regulation, domestic sewage produced by the staff is treated up to standard with an all-in-one buried sewage treatment	110	the Province Development-	planning and construction

	from the processing course on to the water environment:	system and used for irrigation or discharged, and the sewage from all the enterprises should be reused after the necessary treatment, the treatment measures taken in different enterprises are described as follows: 1.The walnut processing enterprises 1).The waste water produced from the walnut processing series are waste walnut milk and oily waste water lixiviated from the production process, In the walnut milk processing workplace the course of boiling water blanch produces waste of pollution factor of COD, BOD5and NH3-N, According to the sewage disposal coefficient of milk beverage and vegetable protein drinks manufacturing (Table1)COD 777mg/L, BOD5 375mg/L,NH3-N 25mg/L, the third volume, the first general survey on the industry pollution sources and pollutants sewage disposal coefficient, generally speaking, this lixiviating work process may produce a spot of waste water, in the lixiviating work process, dissolvent gas and mixed gas are condensated and the dissolvent is recycled while the rest organic wastes containing pulp chip etc., and other suchlikes, is discharged from the water chamber, the oily waste water from the squeezing work section contains the pollution factors: COD, BOD5,ss, vegetable oil, the general concentration is COD 750 mg/l,BOD5375 mg/L, SS250 mg/L, vegetable oil 200mg/L; After the alkali refining it is required to remove the rudimental nigre and other cruds from the waste water; it is produced intermittently, it contains mainly oil, aliphatic acid, and suspended matter, COD concentration is high and much oilly; 2).The aqueous vapour produced from the project vacuum drier enters condensator, the condensated waste water contains mainly grease; The aqueous vapour produced from the deodorization tower enters condensator, the condensated waste water contains mainly grease; The treatment of the waste water is recommended to adhibit anaerobe method(e.g., acidification, etc.), this is to reduce the content of COD and increase the biodegradability of the waste water and privide the next procedure with a basis; To the best of the abilities reuse the treated waster, as to the unavailable waster, treat it up to standard and discharge into correspondent water functional receiving water, strictly prohibit discharging it out directly. 2.The forage and organic fertilizer processing enterprises After the construction of the project, it will produce the waste water from the ground sanitation cleaning, as the materials used in the production processes are relatively simple, and not of any organic solvent and other suchlikes, so, the t will produce the waste water from the ground sanitation cleaning are mainly pollutants SS, and it reused for dustfalling in the area after a simple treatment. 3. The slaughterhouse The waste water from this project includes livestock dung wash water from the waiting lairage,		oriented poverty Alleviation Center, the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	bureau, the Bureau of Agriculture and Animal Husbandry, Environmental Protection Bureau,the Town/Township Comprehensive Managing and Controlling Department and the relative geologic hazard administration section

		that ground wash water containing bloodiness and livestock dung from the slaughterhouse and the high temperature water containing a great deal of pig hair; the out discharged waster water from this project includes mainly: PH:6.5 ～ 8.5, CODcr:1500mg/L, SS:900mg/L,NH3-N:,50mg/L,BOD5： 800mg/L;Discharging directly can not reach the first standard of the Meat Processing Industry Water Pollutants Discharging Standard,(GB13457-92);the present plan does not involve the sewage treatment process, so the environmental protection apraisement recommend to adhibit the mode of "grille pond+modulation pond+ hydrolyzing pond+ organism touching oxidation pond+ settling basin", this is the buried sewage treatment facilities; The treatment process synopsis: the general sewage first enters the septic tank, and then is removed the bulky cruds by the grilles, after that, it runs into the modulation pond having the flow modulated and the water quality homogenised, next, it is pumped measuredly into facultative pond and treated with anaerobic treatment using the hydrolyzing and acid producing effect of facultative bacteria, change the hard degradable macromolecule organic matter into easily degradable micromolecule organic matter, and change insoluble organic matter into dissoluvable organic matter, in order to increase the biodegradability of the waste water; The waste water runs into the organism touching oxidation pond and is treated in aerobiotic biochemical ways, there are a great number of erobiotic bacteria hanging on the organic paddings in the organism touching oxidation pond, these erobiotic bacteria decompose the organic matter into inorganic matter; the outlet of the organism touching oxidation pond inducts the waster to run back to the facultative pond where the waster water is denitrified, reflux ratio is 1:2, and the rest out water enters the settling basin, the dead deciduous biomembrane in the waster water enters the settling basin together, at this time, add flocculants to produce materialization reaction to achieve the separation of solid and liquid, and then the out water enters the clear water pond and the water treatment is up to the standard and discharged or reused for greening, etc.. 4.The fresh-keeping refrigerated storage The waste water in this process includes mainly the ground wash water and the water used in cooling circulation process, the water used in cooling circulation process is cycle-used instead of being out discharged, the ground sanitation wash waste water mainly contains SS, and such waste water can be reused for dust falling in the area after a simple treatment, instead of discharging out. 5.The tea processing enterprises In the project production process the water used in the ferment phase is dried and evaporated by naturally airing, so this process does not produce any waster water			
	The influence of pollutants from the	1.Enhancing the verdurization of the project area, plant lofty leafy arbor trees around the area to avoid the noise, adhibit low noise equipment, adopt sound insulation, noise elimination, sound absorption and vibration isolation etc. measures;	22	the Province Development-oriented poverty	the County Environmental Protection

	processing course on to the sound environment:	2. As all the mechanical equipment are installed inside, so the environmental protection apraisement requires to choose low noise equipment and install vibration damping foundation under the bottom, the workplace should be installed sound insulation doors and windows, by the sound insulation treatment in the workshop, the noise will decrease naturally; 3. Fefrigerator and generator should be installed in single rooms; 4.To install noise reduction barrier outside The water cooling mouth to keep the noise sensitivity in the acoustic shadow of the noise reduction barrier; the noise reduction barrier can not completely shut off the water cooling mouth resulting in the influence on the heat dissipation effect; optimally design the structure and form of the cooling tower to ensure the noise sensitivity in the acoustic shadow of the noise reduction barrier, at the opening of the noise reduction barrier, istall sound absorption to reduce low acoustic diffraction and ensure the effect of noise treatment		Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	Bureau, the Town/Township Comprehensive Managing and Controlling Department, Bureau of Agriculture and Animal Husbandry
	The influence of pollutants from the processing course on to the ambient environment:	1. Shortening the period of raw material storage to avoid the corruption and loss of the raw material 2. In the stages of the storage and processing, monitor and regulate and control the refrigeration and temperature reduction system to avoid product consumption and power consumption, at the same time, to avoid producing of peculiar smell, as to the raw material that are deposited outside, consider palisading them to decrease the consumption to the minimum; 3. In the early stages (e.g., in the farmland) have the raw materials cleaned, screened and classified to decrease the quantity of the organic waste and substandard products of the factory; 4.Keep the solid waste dry, consider treatment in ways of dunghill/using for soil conditioning; 5. The organic or inorganic fragments or ordures, solid organic substance and liquid sewage(sludge produced from the sewage treatment), etc. still remained after all the above measures for controlling the production of waste water, can be recycled and used as soil conditioner(based on the appraisement of potential influence on soil and water resources) or can be used for generating electricity, thus complete garbage reutilization ; 6. Collecting nonconformity raw materials, use them in other production, seal up and pack the collected solid and liquid waste, place the by-product of each product separately and isolate them with the waste, to increase the effect to the maximum and reduce the waste; 7.The culturing process of edible mushrooms may produce culture medium waste residue, the culture medium waste residue should be collected in way of dunghilling and reused as fertilizer for the fruit-bearing forest, the culture medium waste residue may have less environmental impact; 8. Classifying all the solid waste, the general garbage should be removed periodically by the environmental sanitation cection and the skin and fur from animals can be recycled and reused while the hazardous waste must only be treated by the qualified authorities.	33	the Province Development-oriented poverty Alleviation Center the Municipality Development-oriented poverty Alleviation Center and the County Development-oriented poverty Alleviation Center, the project town/township and village	the County Environmental Protection Bureau, the Town/Township Comprehensive Managing and Controlling Department, Bureau of Agriculture and Animal Husbandry

Table 8.3-1 Environmental protection personnel training program

Object	Training content	Number of the participating trainees	Period (day)	Cost (10 thousand)
Municipality level and county level the principal of the Poverty Alleviation Office, administrative staff and technical personnel	The World Bank and China government interpretation and application of the laws, rules, environmental criteria and standards involved in this project	5/ per county, 55 in total	5	8.25
	The environmental management and environmental protection mitigation measures including the positive/negative impact, environment protection regulation, environmental management organization, implement and supervision, etc.			
	The principle, planning and implementation of diseases and insect pests comprehensive management plan and insecticide application amount and method of application			
	The environmental monitoring planning and implementation including the monitoring point location, the monitoring option of object factors and the determination of the monitoring frequency			
town/township level the principal of the Poverty Alleviation Office, administrative staff and technical personnel	Environmental management and protection regulation including project implementary positive/negative benefit, environmental impact and environmental protection mitigation measures	2/ per town 126 in total	4	10.08
	The integrated management planning and implementation plant diseases and insect pests			
	Environmental monitoring planning and implementation including the monitoring point location, the monitoring option of object factors and the determination of the monitoring frequency			
the principal of the Poverty Alleviation Office of the project village, administrative staff and technical personnel	Environmental management and protection regulation including project implementary positive/negative benefit, environmental impact and environmental protection mitigation measures	2/ per village 488in total	4	29.28
	The integrated management planning and implementation plant diseases and insect pests			
	Environmental monitoring planning and implementation including the monitoring point location, the monitoring option of object factors and the determination of the monitoring frequency			
	Sties designing and livestock and poultry pollution control program for breed aquatics			
	The hot-blooded breeding techniques and fertilizing administration program			
	Environmental management REP, environmental supervision REP, how to compile environmental monitoring report			
contractor and the person responsible for fabricating yard environmental protection and headman	Mitigation measures for construction period and environmental protection and safety post training in the environmental management plan	2/construction section	2-3	10
	Simple monitoring ways of noise, etc., and controling measures(self testing) in the construction period	2/construction section	2-3	
Supervision engineer	Measures and requirements on the environmental administration program, the environmental protection Regulations, construction program, supervising detailed rules and regulations on construction	1-2/construction section	2-3	10
	Ambient air monitoring and controlling technique, noise monitoring and controlling technique	2/construction section	2-3	

owner department/ operating department and environmental management personnel	All the above contents, the measures in operation period of environmental administration program, and the operation and maintainence of the environmental protection facilities	200 (initial estimates)	2-3	8
peasant individual household	Environmental administration program and environmental protection measures implement for private investor planting and breed aquatics	1100 (initial estimates)		23.84
total		/	/	99.45

8.4 Environmental monitoring program

This project has a large scale and the areas involved and the project kinds of its own are extensive and complex. The implement of the project has a long-term, potential and uncertain influence on the surface water, the vegetation, the soil, the land utilization, the energy supply and social economy and other suchlike environmental elements.
Therefore, it is required to monitor the project in the phases of designing, construction and operation to appraise the real environmental impact and get information of the unfavorable impact and its extent, and finally provide the supervision, countermeasure research and environmental management in different phases with reference.

The monitoring mission should be entrusted to environment monitoring station of the city the project county subordinated to /county or provincial agriculture environmental conservation monitoring station by the responsible department of the project county.

The monitoring analytical method adopts Environmental Monitoring Technical Specifications (issued by the National Environmental Protection Administration (NEPA)) and the correspondent project monitoring analytical method in the classified monitoring techniques and methods in the same document.

The environmental impacts in the construction period includes noise, dust, water pollution. The sanitary waste produced in the construction period can be treated by using the septic tank of the residence nearby and used for farmland fertilizing, and the waste water produce is precipitated and oil-removal treated and reused; as the environmental impact in period of the construction is not long term and it is not the inevitable one and project can avoid the nvironmental impact as long as it enhances the construction management, here some factors involved, such as TSP(total suspending particles), SS(suspended seston), petroleum and noise are all monitored by eye or other sense organ, the environment supervising department enhances environment supervising and controlling during the construction period according to the environmental impact and mitigation measures.

Therefore, the important monitoring stress of this is in the operation phase. This project involves mainly agriculture planting items, agricultural products processing items and breed aquatics item. The environmental monitoring of the project including the project area 11 counties in total and all the towns or townships as well as the villages subordinated. The concrete environmental monitoring program (index, cycle, monitoring frequency, monitoring methods, monitoring department) See Table 8.4-1.

The project management office should also arrange those personnel who have received the special environmental monitoring training to environmental monitoring at times in order to find problems and resolve them in time. The daily monitoring includes: monitor the noise environmental impact by using portable acoustic meter on the project site or around the noise sensitivity; observe the harmful environmental impact situation produced from the

construction of the project by eye, for example, it brings large-scale water-soil loss, etc..

The county project office supervise and inspects and collects the following items: how the environmental measures are carried out, how the things are going with the training, and the environment monitoring data and conclusion, and periodically report to the leadership in the provincial project office; the provincial project office compile the report of carryng out the general environmental administration program, and it is finally submitted to the World Bank.

8.5 The program for disease and pest controlt

China government has issued a series of important policies in allusion to the agricultural propagation extermination of disease and insect pest with the aim to keep/ controll the propagation diseases and insect pests at a lower level, to facilitate the productive quality, to increase agricultural resource sustainable exploition and use and to protect the agricultural resource and the ecological environment.

Over the years, the national animal and plant conservation policies have been emphasizing the animal and plant conservation guideline: prevention is the dominat way, prevention and controlling must be carried out scientifically, the prevention work must comply with the relative laws, Everything to try is for the health, these policies attach importance to the animal or plant quarantine in order to prevent the invasion and contagion of the animal and plant diseases and insect pests; first adopt biological, physical and agricultural prevention methods with the chemical way(insecticide) as the assistance, attach importance to application of the substitutes of chymical pesticide; attach importance to the production of the pollution-free food, green food(Rank A) and organic food (Rank AA).

This project specially has engaged correlating experts to establish The Program of Extermination of Disease and Insect Pest (See Attachment 2 for details), and this program must be carried out in this project to nsure the normal operation and the product quality.

Table 8.4-1 Environmental Monitoring program

Monitoring Item	Monitoring Index	Monitoring Frequency	Monitoring Location	Monitoring department	Responsible department
Soil erosion monitoring	Soil erosion Module, flow	Once/per year The 1st,3rd and 6th Year after the implementation	Respectively choose one planting town and one monitoring site in Wuchuan, Weining and Sinan each	city agricultural environmental monitoring station The water-soil loss monitoring station	Provincial and city Center for poverty alleviation
Soil fertility Monitoring	N, P, K, organic matter			city agricultural environmental monitoring station provincial soil fertility station	Provincial and city Center for poverty alleviation
Water Pollution Monitoring item	pH, dissolved oxygen COD_{Cr},BOD_5、NH_3-N、Total coliform, SS	Once/per year The 2nd and 5th Year after the implementation	Respectively choose one monitoring site at the walnut processing plants in Yinjiang and Zheng'an the discharge outlet of Nayong slaughter house and at the discharge outlet of breeding aquatics	city and county environmental monitoring station	Provincial and city Center for poverty alleviation
Drinking water	pH chroma, dissolved oxygen COD_{Cr},BOD_5,NH_3-N, coliform, stink,total hardness nitrate total number of bacteria	Once/per year The 1st,3rd and 6th Year after the implementation	One /each project county	city and county environmental monitoring station, city and county sanitation and epidemic station	Provincial and city Center for poverty alleviation
Ground water	pH, chroma, opacity, stink, total hardness nitrate, total number of bacteria	Once/per year The 1st,3rd and 6th Year after the implementation	respectively one in the breeding town in Wuchuan, Yanhe, Nayong, Yinjiang, Shiqian and Weining	city environmental monitoring station city sanitation and epidemic station	Provincial and city Center for poverty alleviation
Pest and disease damage	Occurrence rate	See prevention scheme of pest and disease damage for details			

9 CONCLUSIONS

In summary, the proposed project conforms to relevant national and local planning; sensitive areas like Nature Reserves, endangered animals and plants, and precious and ancient woods are not involved in the site selection of the project; cultural heritages won't be influenced; full respect will also be given to the customs and traditions of local ethnic groups.

The beneficial effects arising from the implementation of the project takes a leading position in agro-ecosystems, adverse effects are minor, irreversible effects are tiny and most of the adverse effects could be lessened and overcome by the implementation of various environmental protection measures.

Therefore, the assessment believes that, as long as the project implementation and production process follow relevant environment policies of the World Bank and the domestic "three simultaneities" system which means to carry out the designing, construction, and operation at the same time, reduce the adverse impact of the project to a minimum to achieve the unity of economic, social and environmental benefits, achieve sustainable economic, social and environmental development. From the perspective of environmental protection, the World Bank Loan for Guizhou Rural Development Project" is feasible in the sense of environment.