

**European Investment Bank-financed
Forest Ecological Restoration Project along the Yellow
River Valley of Shanxi Province**

Social Impact Assessment Report

Shanxi Academy of Forestry Sciences

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Forest Ecological Restoration Project along the Yellow
River Valley of Shanxi Province**

Social Impact Assessment Report

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Executive Summary

Shanxi is in the process of preparing for “European Investment Bank-financed Forest Ecological Restoration Project along the Yellow River Valley of Shanxi Province,” which will be launched in six counties - Lingqiu, Fenyang, Liulin, Hequ, Shenchu and Baode - along the Yellow River. As part of the project preparations, the Forestry Department of Shanxi Province entrusted Shanxi Academy of Forestry Sciences to conduct a social impact assessment of the project area in August and September of 2014.

I Procedures of Social Impact Assessment

1. Investigation Preparation for Social Impact Assessment

- 1) understand the content of European Investment Bank-financed Forest Ecological Restoration Project along the Yellow River Valley of Shanxi Province, communicate with key informants to identify the purposes and content of the social impact assessment, and establish a working team for the social impact assessment;
- 2) design survey questionnaires and tables, and collect second-hand data at the county level through key informant interviews, and statistics tables;
- 3) collect information and literature on forestry development and relevant policies at the national and provincial level.

2. Field Survey of Social Impact Assessment

Major activities include:

- 1) conducting institutional investigations and analysing stakeholders at the county level;
- 2) conducting policy appraisal through interviews and by reference to forestry policies and guidelines;
- 3) filling in the county social and economic table with collected data of socioeconomic statistics at the county level, and sorting out and cataloging the relevant data on demographics and resources;
- 4) conducting investigations at the village level.

3. Data Analyses and Report Writing

The social impact assessment team compiled and made an on-the-spot record of the collected first-hand and second-hand data, arrived at a result through analyses and comparisons of the data before finally finishing the report on social impact assessment.

II Social Impact Assessment Methods

The social impact assessment team has adopted a participatory method throughout the whole process of social impact assessment and the following participatory assessment tools and methods at the village-level investigations:

1. selected land utilization mode and species of trees by showing and using the participatory ranking and scoring method;
2. conducted a SWOT analysis of the project. With the help of investigators, the team used the matrix analysis method to conduct a participatory analysis of the impact on the project;
3. conducted open-ended interviews in line with the designed questionnaires in institutional investigations.

III. An Analysis of the Stakeholders

There are both institutional and individual stakeholders in the European Investment Bank-financed Forest Ecological Restoration Project along the Yellow River Valley in Shanxi Province, including, among others, Shanxi Forestry Project Office for International Finance, county governments, forestry bureaus, township governments, township forestry stations, forest farms and villagers of the project area.

1. Major stakeholders at the village level

The proposed project can bring labor income and, after trees grow into timber, economic benefit and other changes, such as improved living environment, to villagers. The participating villagers will be the direct beneficiaries.

2. Township government staff

Township government staff, township forestry personnel, technicians, and personnel in charge of technique extension are important organizers and technical services providers in the afforestation activities, all of whom will supervise the follow-on forest maintenance and the use of the forest land.

3. County-level institutions

Forestry bureaus at the county level will be in charge of communication between the leadership and masses and participate in the project plan and design and help purchase saplings, and organize professional teams to construct, and hold training workshops for rural households. The benefit expectations of these institutional personnel are to raise their capacity building through the project implementation.

4. Provincial institutions

Shanxi Forestry Project Management Office for International Finance is the project organizer giving specific direction to all the work of the project and in charge of communication between the World Bank Loan Project Management Center of the State Forestry Administration and relevant agencies at the city and county level. It will organize the project establishment and preparations, help arrange project capital, supervise project implementation, hold training workshops, conduct supervision and appraisal, and, finally, finish project examination and acceptance. The benefit expectations of these institutional stakeholders are to raise their capacity building through the implementation of the project.

IV. Major Findings in Social Impact Assessment

1. Land use and farmers' desired plantations in the project area

Demands for tree species vary between different areas and people. The investigation team, using the participatory ranking and scoring method, guided the villagers in the project area to preliminarily choose the species of trees of their liking. The result suggests that most of the rural households have put fruit trees at the top of the list, but some of them in the project area have chosen ecological trees. Those villagers who have chosen fruit trees put more of a premium on economic revenues, a thinking that represents most of the farmers. However, some rural households, having thought of the difficulties in management if they would plant fruit trees in the far-located land, but also of other factors like site condition, climate pattern and water accessibility, have placed ecological trees, like Chinese red pine and oriental arbovitae, on top of the list. (Please refer to the following table of tree species that farmers have chosen in order of their preference)

project county	township	village	selected tree species (in order of preference)
lingshi	Nanguan	Qiaojiashan	walnut> jujube> Chinees scholar tree > oriental arbovitae> Chinese red pine
	Liangjiayan	Yanyi	oriental arbovitae> walnut > lacebark

			pine> jujube> black locust
Fenyang	Lijiazhuang	Nanyuandi	walnut> oriental arbovitae> aspen/weeping willow
	Yangjiazhuang	Gaojiazhuang	Chinese red pine> walnut> apricot> aspen/weeping willow
Liulin	Liuyu	Gaojiagou	walnut> black locust> apricot
	Jinjiazhuang	Kudaogou	walnut> apricot> pine
Hequ	Xunzhen	Wuhuachengbao	apricot> nectarine > peach> walnut> crabapple> Chinese red pine> cypress
	Louziying	Bailuquan	jujube> crabapple> apricot
Shenchi	Dayanbei	Chenjiayao	Chinese red pine> korshinsk peashrub > dragon spruce
	Liebao	Xiejialing	Chinese red pine> korshinsk peashrub> sea-buckthorn > sour jujube
Baode	Yaogetai	Wangjiazhai	Chinese red pine> oriental arbovitae> pear/ pear jujube> walnut (having difficulty surviving the to the winter)> apple
	Yaowa	Zhangjiahe	oriental arbovitae> Chinese red pine> korshinsk peashrub> apple> pear jujube/black locust

2. A SWOT Analysis of the Proposed Project

Together with villagers, the assessment team analysed the strengths, weaknesses, opportunities and threats involved in the implementation of the project in villages. The result shows:

The strengths in the project implementation in project area are:

- ✓ plenty of land;
- ✓ having experiences;
- ✓ suitable climate conditions;
- ✓ high economic revenue;
- ✓ villagers' willingness to implement the project;
- ✓ strong willingness for afforestation from households with large tracts of land;
- ✓ villagers' willingness to improve the environment;
- ✓ having more time for rural households to go out for work

The weaknesses of the proposed project implementation in the project area are:

- ✓ possible land rivalry between grain growing and tree plantations;
- ✓ lack of skills;
- ✓ shortage of water;
- ✓ shortage of labor force;
- ✓ difficulties in afforestation due to poor transportation;
- ✓ possible tension between afforestation and animal husbandry in some areas;

- ✓ difficulties in maintenance and management;
- ✓ possible negative effect on fruit sales due to poor transportation

Potential opportunities of the project implementation in project area are:

- ✓ opportunity to carry water;
- ✓ opportunity to dig wells;
- ✓ Potential opportunities to lay down village regulation and folk rules to solve the tension between afforestation and animal husbandry;
- ✓ easy to manage timber plantations;
- ✓ opportunities to tap into non-timber forest products;
- ✓ opportunities to solve the problem of labor shortage by unified plantation and professional management

Risks of the project implementation in project area are:

- ✓ possible quarrels about benefit distribution if households with large tracts of land borrow the contracted land from farmers;
- ✓ possible natural disasters like disease and insect pests, rabbit pest, frost damages to flowers and fruits;
- ✓ failure in afforestation effort resulting from lack of water;
- ✓ failure resulting from poor maintenance and management;

- ✓ possible conflicts between afforestation and agricultural activities;
- ✓ product sales risks when trees yield fruits

3. Analysis of rural households' desired participation and management mode

Villagers are keen to participate in the project as they want to be consulted with when problems crop up. Villagers want to select the species of trees of their liking to plant and choose where the plantations would be located trees if trees are to be planted in their own plot of land. The majority numbers of villagers choose afforestation teams in terms of plantation and management and maintenance, and they think it is a good way to be handed over the management to them when the saplings are alive and kicking. Only a couple of villages are opposed to it and all the project villages hold that women should be involved in all the activities of the project.

4. Rural households' suggestions to the project

During the survey, rural households have expressed their willingness and given a number of suggestions:

village	Suggestion
Qiaojiashan	Households with large tract of land to plant trees, which is easy to manage

Yanyi	Households with large tract of land have advantages ; there is a big gap between the poor and the rich. So that they be given larger area of land and increase their revenue.
Nanyuandi	Standards for ecological trees be swapped for those of fruit trees as ecological trees are expensive to maintain and need much water.
Gaojiazhuang	Standards for ecological trees be swapped for those for fruit trees as the site conditions for ecological trees are generally poor, which will cost much to water them, and saplings are big, which may raise their preserving rate. Fruit trees tend to be planted in good plots of land and have access to water, which cost less.
Gaojiagou	<ol style="list-style-type: none"> 1. They want good tree species that are suitable for site conditions like walnut trees and that the project could make the best use of the gully land ; 2. they be provided techniques for disease and insect control and tending technology ; 3. that an impounding reservoir be built as there is no road and water in the mountain.
Kudaogou	<ol style="list-style-type: none"> 1. They want good species of trees that are suitable for site conditions ; 2. they be provided with insect and disease control technique and tending techniques.
Wuhuachengbao	<ol style="list-style-type: none"> 1. More attention be devoted to mainenance and management than afforestation ; 2. they be provided with irrigation equipment as regular irrigation is a problem.
Bailuquan	<ol style="list-style-type: none"> 1. They be given water pumps and impounding reservoir be built at the top of the mountain to solve irrigation problem ; 2. farmers be guided to learn fruit tree management and reprocessing techniques through the implementation of the project.
Chenjiayao	They are willing to plant Chinese red pine and other fruit trees and to adopt collective planting and management in future plantation

	program.
Xiejialing	They are willing to plant Chinese red pine, korshinsk peashrub, and other fruit trees and to adopt collective tree planting and management in future afforestation program.
Wujiashai	1. Incomes vary as little as possible ; 2. technical personnel participate and be provided with technical services.
Zhangjiahe	1. They are willing to plant fruit trees and to increase the scale of fruit tree plantation on continuous mass of land in future afforestation program ; 2. more trees with economic value be planted

5. The Project impacts on different rural households

In our survey, the maximum average income per year in villages is 10,689 yuan while the minimum is only 2,000 yuan, with most earning between 3,000 and 4,000 yuan. Most of the able bodied young men in villages are out as migrant workers; the more migrant workers a family has, the richer the family is. On the contrary, the less labor one family has, the fewer incomes it gets. In particular, households with elderly and diseased members have become the impoverished families in villages.

The proportion of rich households in the project area is relatively small and these households are engaged mainly in mining operations and they pay scant attention to the project, but they still have land and might get benefit from the project. Relatively well-off households, middle-income households and poor households are in the majority, whose incomes come mainly from doing migrant work and farming. The implementation

of this project could increase their incomes from fruits harvesting and labor compensation. As compared with farming, tree planting could reduce the amount of labor in the fields, thus giving them more time to go out to work, becoming beneficiaries from the project. The rate of extremely poverty households, mainly those with no labor force, is not high and, if they have land, could also be beneficiaries of the project.

6. An analysis of social gender of the project

The survey shows that most of the women in villages do household chores, cook meals, or take care of children and elderly people. Because males have left their villages to work, some of the women are in charge of farming and tree-planting, and some women in animal-raising households raise sheep. Most of the male villagers go out to do either long-term or short-term jobs, while some of the elderly males stay at home engaging in farming, tree planting, sheep raising, farm produce sales, or other sideline jobs.

In general, both male and female villagers were involved in the project-related activities, except in a small number of villages, where only male villagers participated. The investigation suggests that the education attainment of the women in these villages is relatively low and they seldom, if ever, make decisions in major family affairs, thinking that things involving afforestation and technical training are the exclusive preserve of male members and that they are only engaged in family

chores, like in Liulin County. Our survey also shows that, in many villages, the number of women participating in farming and afforestation activities is greater than men, like in Yanyi Village, Lingshi County.

With most of the males under the age of 45 going out for work, women shoulder the afforestation and farming work in their families. Males occupy a dominant position in produce sales while females play a major role in weeding, tree trimming and pruning, fertilizer applying, and fruit harvesting.

In the process of the project implementation, male members are in a more dominant position to make decisions than females; female members take part in all other activities of the project, and, in villages where most of the males go out for work, are the major force that implements the project. So in implementing the project, we should avoid the marginalization of women due to the conventions and should, instead, provide women with necessary technical training so that they can be involved in the project in the same way as males.

7. An analysis of socioeconomic benefit of the project

Different forest stands will form in different zones of the project. The project area is spread out in the hilly and gully areas on the Loess Plateau or in the upper reaches of the Yellow River, where, due to its delicate ecosystem, the climate is arid, the soil is poor, and economic structure is

one-sided. With extensive agriculture and free-range farming, and soil erosion, the local ecosystem is deteriorating.

The implementation of this project will play a significant role in protecting and restoring forest cover, and improving the ecological environment of the project area, making a monumental ecological achievement.

The implementation of this project could raise the awareness of farmers toward ecological environment and equip farmers with labor skills, thus boosting the social participation of the underprivileged groups, opening their vision, offering labor opportunities, and gaining enormous social benefit.

The implementation of the project could increase rural households' incomes. Take walnut tree planting as an example: walnuts can yield fruits in four or five years and are in full fruit period after seven or eight years. One tree can yield from five to eight kilograms of walnuts, that is, between 2,100 and 3,360 kilograms of walnuts per hectare. If one kilogram sells for 30 yuan, then it totals 63,000 to 100,800 yuan per hectare. As walnut trees planting cost less than cereal planting, the revenue can be much larger than cereal farming. Besides, when walnut planting takes the place of cereal farming, farmer can save much labor and have more time going out for work.

V. Social Risk Analysis

1. Discrepancy between ecological conservation and farmers' income expectation

The purposes of the project are to increase the forest cover rate in the project area where the ecological environment is very delicate through afforestation efforts, raise the ecology-dominated multifunctions and comprehensive benefit of forests, and put a brake on the increasing desertification, especially soil erosion, in the project area, and, finally, restore its biodiversity; to raise the forest sustainable management level, increase the revenue of forest operations, and provide a pilot study of forest sustainable management and management for multi-functional forest plantations with significant public goods benefits; and to increase forest workers' incomes and overall quality, and encourage the establishment of farmers' professional associations. In a nutshell, the project aims at improving the ecosystem, raising farmers' incomes, and arriving at a perfect harmony between men and nature.

In our investigations, we have found that villagers have a clear understanding of the fact that afforestation would improve local ecological environment and conserve soil and water. But, on the other hand, they have high expectations for the increase of their labor compensations. Questionnaires show that most of the households cared more about their economic benefits than ecological conservation, hence the risk of focusing more on economic revenue than ecological benefit.

Therefore, in the operation of this project, we should actively lead the villagers to the awareness of caring about ecological forest resources, raising the quality of forest resources, and conserving forest diversity, on the basis of which, we should create conditions to increase their incomes.

2. Opportunity discrepancy of project participation between big households and average households

Our survey shows that, apart from the way in which farmers planted trees in their own hilly area, there were other modes: afforestation by big households (those with large tracts of land) and by cooperatives. In Qiaojiashan Village of Lingshi County, we found that some farmers had leased their lands to the big households. If big households participate in the European Investment Bank-financed project, they could get far more opportunities than households with small-scale farming and they could get benefits not only from financial support and personnel training, but also from harvested products, while households that have leased their lands could only receive their rental fee. There exists an apparent discrepancy of benefit opportunity between big households and individual households. As a result, we should try to be equal and fair and should not be impartial to big households and take care of all spectrums of average households in the implementation of the project.

3. Risk of marginalization of vulnerable social groups

In our survey in villages, we have found that women constitute nearly half of the labor force in villages. As most of rural households go out for work, mostly male members as migrant workers, women would usually stay at home in most time of the year, which gives us a glimpse into the important role that women play in the fields. But in our survey, we found that traditional concepts had, to large extent, prevented women from participating in the project. Despite the fact that women shoulder the great majority of the field work, the role they are playing could not be recognized. Women seldom attended the meetings held by this social assessment team. The conventional concept holds that women should stay at home taking care of household chores, children, elderly persons and should not go outside. As to the technical training workshop and decision makings, they should be left to men. If so, women could be easily marginalized and they would not have received the technical training that they deserve and, as a result, would not be able to be in a position to make decisions.

Another easily marginalized social group is poverty-stricken households, which usually have no labor force and, precisely because of lacking labor force, could be neglected in the implementation of the project. Having said that, they have the right to participate and, in the project implementation, their benefit should not be encroached upon and instead be consulted with.

VI. Suggestions to the Project

1. to adopt the method of rural households' application and voluntary participation to implement the project;
2. to adopt the method of participatory consultation, and give priority to local rural households' participation in the process of implementation;
3. to design and choose the right species of trees that will be suitable for the project area;
4. to encourage farmers to formulate village regulations and folk rules to manage the forest plantations and protect the afforestation result of the project;
5. to provide necessary technical support to local rural households;
6. to provide necessary information to local rural households;
7. to give priority to capacity building of the personnel in stakeholding institutions and satisfy their benefit needs;
8. to select area with better transportation to implement the project;
9. to conduct social impact monitoring and appraisal;
10. to adopt the mode of agroforestry;
11. to promote and develop farmers' professional cooperatives.

1. Introduction

1. 1. Project background

In line with the notice of the State Forestry Administration on “Guidelines of National Forestry Development Programs by Using International Finance Organizations’ Loans in the 12th Five-Year Plan” (2011 No.242) and “Supplementary Report of Shanxi Development and Reform Commission on European Investment Bank-financed Forestry Ecological Restoration Project along the Yellow River Valley in Shanxi Province” (2014 No. 211), with the concerted efforts of Shanxi Development and Reform Commission, Shanxi Finance Department and Shanxi Forestry Department, Shanxi has been listed as the implementation province of European Investment Bank-financed forestry project. For this purpose, Shanxi Forestry Department is organizing relevant agencies to prepare for the project application. The title of this program is “European Investment Bank-financed Forest Restoration Project along the Yellow River Valley of Shanxi Province.”

The project area is mainly spread out on the gully and hilly areas of the Loess Plateau and at the upper reaches of the Yellow River. Because the project area has a fragile ecological environment with acrid climate, poor soil, a single economic structure, extensive farming and extensive, free-range animal husbandry, worsening soil and water erosion, its soil erosion modulus arrives at a staggering 5,000 – 6,000 t/km² with 400 million or so tons of silt settled in the Yellow River per year. It is indeed

one of the areas with the severest soil erosion and ever worsening ecological deterioration in China. In recent years, the situation here has been basically reversed and has taken a turn for the better. But as the rate of regional urbanization has been accelerated, the tension between resource development and ecological conservation is still obvious. The implementation of this project is aimed at conserving and restoring forest cover through afforestation and institutional capacity building, increasing economic revenues from forestry, and improving the ecological environment in the project area, all of which are highly relevant and consistent with Shanxi's ecological construction program and ecological development strategies.

The project construction period will be four years with a planned investment of 410 million yuan, among which 25 million euros are loan from the European Investment Bank (1:8.20 as the current exchange rate, there are 205 million yuan) and 205 million yuan as domestic matching fund.

Afforestation scale and investment table per county

Unit: ha, 10,000 euros, 10,000 yuan

Name of unit	scale	Tot invt	EIB loan		Dom fund	
		RMB	EURO	RMB	RMB	
total	19141.19	41000.00	2500.00	20500.00	20500.00	
Xinzhou	subtotal	10141.61	19678.02	1200.00	9840.00	9838.02
	Hequ	3404.08	6566.46	400.00	3280.00	3286.46
	Boade	3143.12	6555.80	400.00	3280.00	3275.80
	Shenchi	3594.41	6555.76	400.00	3280.00	3275.76
Jinzhong	subtotal	2691.26	6572.62	400.00	3280.00	3292.62

	lingshi	2691.26	6572.62	400.00	3280.00	3292.62
	subtotal	6308.32	14749.36	900.00	7380.00	7369.36
Liuliang	Fenyang	3604.98	8192.43	500.00	4100.00	4092.43
	Liulin	2703.34	6556.93	400.00	3280.00	3276.93

1. 2 Project purposes

Through afforestation and plantations in areas with a fragile ecosystem, the project aims to increase the forest vegetation coverage rate, raise ecology-oriented multifunctional forest and comprehensive benefits, put a brake on the worsening situation of desertification, and, in particular, soil and water erosion in the project area, and restore its biodiversity; to raise forest sustainable management, increase the revenue of forest operations, and provide a pilot study of forest sustainable management and management for multi-functional forest plantations with significant public goods benefits; and to increase forest farmers' incomes and their overall quality, and encourage the establishment of farmers' professional associations. In a nutshell, the project will improve its ecosystem, raise farmers' incomes, and arrive at a perfect harmony between men and nature.

1. 3. Scope of the project area

The project will be launched in three cities-Jinzhong, Luliang and Xinzhou-and six counties including Lingshi County in Jinzhong; Fenyang City and Liulin County in Luliang; and Hequ County, Shenchi County and Baode County in Xinzhou. The affected area totals 19,141.19 ha

involving 75 townships, 1,759 villager committees, 404,186 rural households with a rural population of 1,150,369, who are all of Han ethnicity.(see Table 1-3-1)

Table 1-3-1 : Population in the project area

No.	Project area	township	Villager committee	Rural household	population
1	Lingshi	12	291	74593	184129
2	Fenyang	12	289	113937	333551
3	Liulin	15	257	95376	282945
4	Hequ	13	340	44471	117859
5	Shenchi	10	241	27844	86199
6	Baode	13	341	47965	145686
total		75	1759	404186	1150369

1. 4. Socioeconomic information in project counties

The total area of the project area is 498,646.66 ha including 194,073.10 ha of forest land. The total population is 1,436,000 including 1,146,800 rural population, accounting for 79.86% of the total population. There are 566,500 rural laborers including 241,000 women, which accounts for 42.54% of the rural labor force.

Table 1-5-1: Socioeconomic development in the project area

Unit: number, 10,000 people, ha, yuan, 10,000 yuan

Project area	township/station	population	land area	average income	GDP
total	75	143. 60	498646. 66	5137	6638789
Hequ	13	13. 59	11794. 03	1662	227219
Baode	13	16. 2	99419. 00	3815	720288
Shenchi	10	10. 73	147133. 00	4782	136400

Lingshi	12	26.1	120189.95	11913	1934646
Fenyang	12	42.58	104201.98	9933	1099236
Liulin	15	34.40	15908.70	9167	2521000

According to statistics, the GDP of 2013 in the project area was valued at 66.388 billion yuan, among which, 4.718 billion came from first industry, accounting for 7.34% of the GDP in the project area; 47.774 billion from the second industry, accounting for 74.28%; and 13.896 billion from the tertiary industry, accounting for 21.61%. The forestry production value stood at 911 million yuan, accounting for 1.37% of the GDP. Lingshi had the highest rural per capita income with an average of 11,913 yuan per head while Hequ had the lowest incomes with only 1,662 yuan per head, a figure much lower than the provincial average level. Economic development is uneven in the project counties as counties rich in mineral resources have developed better than other areas with most of the area for afforestation plantations remain relatively backward economically. The local rural population is mainly engaged in farming and animal husbandry with low standards of living.

1.5. Project operation and management modes

The people's governments at the county level will ultimately be responsible for shouldering the repayment of project loan. The county project office will sign afforestation plantation agreements with the construction entities to collectively carry out the project and determine

the distribution of the project economic benefit according to mutual agreements.

According to the nature of entities for afforestation operation and management, the project operation and management modes include individual rural household operation and management (i.e. individual households use their contracted barren hilly land.); rural household united operation and management (i.e. individually united households use their contracted land); village collective operation management (i.e. they use collectively-owned land); professional cooperative operation and management; operation and management by large-scale afforestation households; and enterprise operation and management.

2. Tasks and Procedure of Social Impact Assessment

2. 1. Objectives of social impact assessment

The primary objectives of social impact assessment are to make sure that this investment project can enhance the interests and benefits of the stakeholders, especially the benefit of vulnerable social groups through their participation in project design and implementation. Meanwhile, social impact assessment should identify and analyse the latent social risks and potential opportunities resulting from land use rights from the perspectives of different stakeholders. In addition, social impact assessment investigations can establish a set of baseline survey data and information as references for future impact monitoring and appraisal.

The primary objectives and tasks of social impact assessment

2. 1. 1. to understand stakeholders' opinions about the project through interactive consultation and consult them about how to effectively implement the project.

2. 1. 2. to identify and choose ecologically and economically sustainable development project activities, ones that will benefit most rural households and will not infringe upon others' interests.

2. 1. 3. to identify constrictions that the project activities will put on the livelihood and resources utilization.

2. 1. 4. to identify and avoid potential damage to natural and cultural heritage in the project area.

2. 2. Procedures of social impact assessment

The following three steps were adpted to conduct the social impact assessment:

Preparations for social impact assessment investigation

- ✓ understand the core content of European Investment Bank-financed Forest Ecological Restoration Project along the Yellow River Valley of Shanxi Province, communicate with key informants and identify the primary objectives and content of social impact assessment.
- ✓ design questionnaires and tables for the investigation, and collect second-hand county-level data through key informant interviews and other statistics data.

- ✓ collect relevant policy information and documents on forestry development at the national and provincial level.

Field investigations of social impact assessment

The social impact assessment team went to all the six project counties and chose two villages in each county to conduct field investigations with an emphasis on village level investigations. The social impact assessment team composed of staff from Shanxi Academy of Forestry Sciences and Shanxi International Finance Forestry Project Management Office collected data and information at the project villages. Its main activities include:

2. 2. 1. investigating institutions at the county level so as to analyse stakeholders.
2. 2. 2. conducting policy appraisal through interviews and referencing of forestry policy and documents.
2. 2. 3. collecting and putting the county social and economic data into the county socioeconomic table and sorting out and cataloging the demographic and resources data obtained from relevant agencies.
2. 2. 4. having interviews with township heads.
2. 2. 5. launching detailed investigations in villages and rural households:
 - To identify stakeholders within the village and impacts on the project through key informant interviews and collect village-level social and economic data to put into village socioeconomic table.

- To understand farmer's behavior in agricultural and forestry production, methods of resources management and characteristics of their livelihood in household investigations.

Data analysis and report writing

The social impact assessment team conducted on-the-spot recording and collection of the first- and second-hand statistics and analysed and compared data and arrived at relevant conclusions, before finishing the social impact assessment report.

2. 3. Procedures of social impact assessment

The team has adopted a participatory method in the whole process of the social impact assessment and the following participatory tools and methods in village social impact assessment investigations:

- 2. 3. 1. selected land utilization mode and species of trees by showing and using the participatory ranking and scoring method;
- 2. 3. 2. carried out a SWOT analysis of the project.
- 2. 3. 3. conducted a participatory analysis of the project impact using matrix analysis with the help of investigators.
- 2. 3. 4. held open-ended interviews in line with the designed questionnaires in intitutional investigations.

3. Policy Framework Review

3.1. Collective forest tenure reform

Since June 8, 2008, when the CPC Central Committee and State Council promulgated “Opinions on Boosting Collective Forest Tenure Reform,” the reform of collective forest tenure has been rolled out across China. The collective forest tenure reform is an important innovation and improvement on basic operation system in rural areas. As a strategic policy, the Central Committee let individual household undertake the forest land under a contract and every mountain has its “owner.” This was an step forward for and an extension of the Household Responsibility System in China’s countryside, but also an enrichment and improvement on rural basic operation system, and indeed a milestone in rural reform, which would stimulate the creativity and motivation of hundreds of millions of farmers to get rich by planting trees and a great emancipation of rural productivity.

Collective forest tenure reform must follow five principles: first, to adhere to the basic rural operation system, and make sure that farmers can enjoy equal contractual and operation rights to collective forest land; second, to consider the interests of all parties involved and make sure that farmers get real benefit and ecology be protected, and that the bottomline is that farmers would be the beneficiaries but not at the expense of resources overuse, nor at the cost of sacrificing ecosystem; third, to

respect farmers' willingness and ensure their rights to information, participation, and decision-making; fourth, to act according to the law and make sure that reform would proceed smoothly; and fifth, to offer precise and practical guidance to the reform.

Collective forest tenure reform includes, among others, clear demarcation of property ownership, liberation of operations, unambiguous definition of disposal, and ensurance of incomes, all policy safeguards to gurantee that, on the basis of the farmer's rights to operation contract and forest ownership, they could operate, dispose and benefit at their own terms.

On August 6, 2008, CPC Shanxi Committee and the provincial government published 'Opinions on Launching Collective Forest Tenure Reform' and, at the same time, launched a pilot program of Shanxi forest tenure reform, on the basis of which, a collective forest tenure reform was rolled out in the whole province in 2010.

Now, major tasks of the collective forest tenure reform have been finished in the project area as collective forest lands were already contracted to households. Barren hilly lands suitable for planting trees were contracted to households, which was conducive to willingness of farmers to operate on their own terms and suitable for launching the project of Walnut Demonstration Park.

3.2. Farmers' Professional Cooperatives Law

The "Law of the People's Republic of China on Farmers' Professional Cooperatives" put into force on July 1, 2007 was another important piece

of market legislature after coporation law, partnership law, and individual proprietorship enterprises law. The promulgation of this legislation satisfied the objective needs of the development of current farmer's professional cooperatives, was of seminal importance to the regulation and boosting of the construction and growth of farmers' professional cooperatives construction, and the next round of innovation of rural economic system.

Farmers' professional cooperatives are a kind of mutual assistant economic organization that is formed of their own volition and managed democratically by producers or purverors and users of the same kind of produce after household responsibility system. Farmers' professional cooperatives serve all members of the cooperatives and provide services like production material purchases, the sales, process, transport and storage of agricultural produce, and technologies and information of rural productions and operations.

With farmers as its main body and services to members as its purpose, a farmers' professional cooperative seeks for the common interests of all members, who can willingly join and leave the cooperative, where all members are equal and it practices democratic management and profits are distributed according to the ratio of transactions between members and the cooperative. The definition and basic principles of a farmers' professional cooperative constitute the basic features of this law; only those satisfying these features can be incorporated into this law and thus

be registered. The government may offer guidance, support and services to the establishment and growth of farmers' professional cooperatives, which provide a new management mode, in which, they could allocate labor in a more reasonable manner and guard against market risks with synergy.

3. 3. Ecosystem Construction Plan for the Yellow River Jinshan Canyon (Shanxi section)

Located in the middle reaches of the Yellow River, on the eastern part of the Loess Plateau, the Yellow River Jinshan Canyon region straddles the two great belts - middle China and west China - and lies in the buffer zone between North China and West China. With its unique geological condition, abundant mineral and biological resources, profound social and cultural foundation, and attractive tourist resources, this region forms an important economic geology unit, playing a vital role in China's middle region development program. To promote the coordinated development of its economic, social, resources and the environment, the People's Governments of Shanxi and Shaanxi launched a research on "Comprehensive Development of the Yellow River Jinshan Canyon Region" in 2000-2001, a case study of the long-term development of the region and laid down and promulgated in 2007 the guidelines on comprehensive economic development of Shanxi section of the Yellow River Jinshan Canyon Region during the 11th Five-Year Plan period as one part of the guidelines. The guiding principle of the blueprint was to,

under the guidance of Scientific Outlook on Development, coordinate the harmonious development between men and nature, and to ameliorate the ecological environment and raise the standards of living of the local people. It aimed at realizing sustainable development, and combining the ecological construction with regional economic development under the principles of obeying natural and market rules. It stipulated that specific methods be found and that conservation must be combined with control and that it must proceed in a coordinated manner in order to stop the worsening situation of the ecological environment, realize the unity of ecological benefit, economic benefit and social benefit, and create a society where people live a well-off life and the environment is friendly.

The basic principle of the blueprint was people-oriented while its purpose was to lift living standards of the people. Top priority was given to key area and projects that had a bearing on the ecosystem. The guideline stressed that we should combine biological measures with engineering and technical measures, and should have a comprehensive development plan for mountains, water, fields, and forests; a comprehensive treatment and control of tableland, ridges, hills and slopes; and a comprehensive development of forest, cereals and fruits. Longmenyuan 10,000-mu Walnut Park is located in the Yellow River Jinshan Canyon region and consistent with the ecological development blueprint of the Yellow River Jinshan Canyon Region (Shanxi region).

3. 4. Procedures of Shanxi Province for Closing Mountains and Banning Grazing

To conserve and ameliorate the ecological environment, consolidate the achievement of forest plantations, and achieve the coordinated development of economy, society and ecology, the People's Government of Shanxi Province promulgated in 2007 procedures for closing mountains and banning grazing, which stipulates that sheep and cattle farming is banned in designated forest lands and pastures, and, at the same time, burning, picnic cooking, reclamation, illegal felling of trees are prohibited. Also banned are poaching, wild life collection, illegal mining, quarrying, removing sand and soil, moving signs and posts of closing mountains and banning grazing, and other activities that may cause damage to the closing of mountains and banning of grazing. The city of Luliang began closing mountains and banning grazing on December 1, 2008. This policy can protect the fruits of afforestation and help the implementation of the Longmenyuan 10,000-mu Walnut Park project.

3. 5. European Investment Bank Climate Change Framework Loan Agreement

Set up in 1958, with its headquarters in Luxemburg and 27 European Union member states, European Investment Bank is a regional non-profit multilateral finance institution. Since 1995, when EIB cooperated with China, it has lent a total loan of 2 billion euros to China, with a focus on

renewable energies, clean energy, energy saving and emission reduction, and other forestry development. On February 13, 2012, the Finance Ministry signed an agreement with European Investment Bank of China Forestry Framework Loan, with a loan of 250 million euros to be used for forest plantations, for planting windbreak trees, timber trees, and cash trees, as well as forest tending, reform of low-function forest, forest ecological restoration and sustainable development, and forest biomass energy. The purpose of EIB China forestry framework loan is to strengthen the Sino-European cooperation in mitigating climate change, in particular forest carbon sinks, and to contribute to the mitigation of climate change. This project is of positive significance to boosting China's forestry growth and sustainable development of its socioeconomy.

4. Major Stakeholders of the Project

Social impact assessment team has analysed the stakeholders and also identified and classified the stakeholders in its social impact assessment at the village level, as shown in Table 4-1-1.

4. 1. Major stakeholders at the village level

Rural households are the contractors of land, the main body for managing the land, but also owner of land products, so all rural households involving in the project are stakeholders.

4. 1. 1. Rich households account for 10-20% of the rural households of the project area, and their incomes come mainly not from growing grain but from working as migrant workers and doing businesses, and they still have land in villages. They can receive more benefit from the implementation of this project as they can save more of their energy and time to do business and therefore they are the beneficiaries of the project.

4. 1. 2. Average households account for 50-60% of the rural households of the project area and their incomes are composed of two parts: one as compensation from migrant work, accounting for 80%; the other from growing grain, accounting for about 20%, and they are major targets of the project. The implementation of this project will give them more benefit from land, and also can save time and energy to go out for work, and therefore they are beneficiaries of the project.

4. 1. 3. Poor households account for 20% of the rural households in the project area and their primary incomes come from cultivating land. The

implementation of this project will give more benefit to them as they can save labor, and therefore they are the beneficiaries of the project.

4. 1. 4. Poverty-stricken households account for 10% of the rural households in the project area and they are generally in shortage of labor force and their main incomes come from cultivating land. The implementation of this project will save them labor and give more benefit from the land, and therefore they are the beneficiaries of the project.

4. 2. Township government staff

Township government cadres and township forestry workers, technical and extension personnel are important organizers and technical services providers in afforestation effort, and they will monitor the follow-on forest maintenance and protection and use of forest land. Their benefit expectation is to raise their capacity building in the implantation of the project.

4.3. County institutions

Country forestry bureaus are responsible for the communication between high-ups and masses and help in the design and plan of the project and purchase saplings, organize professional teams to construct and host training workshops for rural households. Their benefit expectation is also to raise their capacity building in the implantation of the project.

4. 4. Provincial institution

As the manager of the project, Shanxi International Finance Forestry Project Management Office is responsible for directing all the work of the project; serve as liaison between the World Bank Center of State Forestry Administration and relevant agencies of various cities and counties. They will organize the preparations of project identification, help arrange project capital, monitor the implementation of the project and host training workshops and conduct monitoring and appraisal, and, finally, check and accept the project when it finishes. The institutional staff's benefit expectation is also to raise their capacity building in the implantation of the project.

Table 4-1-1: Major stakeholders and roles they play in the project and their expectations from the project

stakeholders	roles and functions in the project	Opinions and expectations of the project	Suggestions to the project
1. stakeholders at the village level			
rich households	<ul style="list-style-type: none"> ➤ are contractors of the land, and beneficiaries of the project ➤ Account for 10-20% of the rural households 	<ul style="list-style-type: none"> ➤ As the owner of the land, they are interested in participating in the proect ➤ Are willing to raise the production efficiency of the land to increase their incomes 	<ul style="list-style-type: none"> ➤ Adopt the method to both increase economic benefit and improve the environment
average households	<ul style="list-style-type: none"> ➤ are contractors of the land, and beneficiaries of the project ➤ account for 50-60% of the rural households and are major beneficiaries of the project ➤ are sources of labor for the project 	<ul style="list-style-type: none"> ➤ are highly interested in the project ➤ increase incomes ➤ may save more time to go out for work ➤ wish to get technical support 	<ul style="list-style-type: none"> ➤ take part in the design and implementation and monitoring of the project ➤ plant more trees with economic value
poor households	<ul style="list-style-type: none"> ➤ are contractors of the land and beneficiaries of the project ➤ account for 20% of the rural households ➤ may provide labor to the project 	<ul style="list-style-type: none"> ➤ wish to have equal right to the participation of the project ➤ increase incomes from the project 	<ul style="list-style-type: none"> ➤ take part in the design, implementation and monitoring of the project ➤ plant more trees with

stakeholders	roles and functions in the project	Opinions and expectations of the project	Suggestions to the project
		➤ wish to receive technical support	economic value
poverty-stricken households	<ul style="list-style-type: none"> ➤ are contractors of the land and beneficiaries of the project ➤ account for 10% of the rural households ➤ lack labor force 	<ul style="list-style-type: none"> ➤ wish to have more reasonable method in management so as to take care of the households that lack labor force 	
women	<ul style="list-style-type: none"> ➤ account for 40-45% of the labor force and both take care of family and do field work ➤ are major labor force for planting trees and management 	<ul style="list-style-type: none"> ➤ expect to increase incomes from planting fruit trees ➤ get technical training from the project 	<ul style="list-style-type: none"> ➤ wish to take part in the design, implantation and monitoring of the project
2. at the township level			
township government staff and technical personnel	<ul style="list-style-type: none"> ➤ take part in the design ➤ take part in the organization and coordination of tree planting ➤ supervise the growth of trees ➤ provide technical assistance 	<ul style="list-style-type: none"> ➤ concerned about township socioeconomic development ➤ improve ecosystem 	
3. at the county level			
county forestry bureaus	<ul style="list-style-type: none"> ➤ take part in the design and plan ➤ help purchase saplings and organize professional construction teams ➤ conduct training workshops to rural households ➤ communicate between the high-ups and 	<ul style="list-style-type: none"> ➤ Realize ecological sustainability ➤ Raise land efficiency and production ➤ Increase the incomes of rural households 	

stakeholders	roles and functions in the project	Opinions and expectations of the project	Suggestions to the project
	masses		
4. at the provincial level			
Shanxi Forestry Management Office for International Finances	<ul style="list-style-type: none"> ➤ Prepare the establishment of the project ➤ Help put in place the matching funds ➤ Monitor the implementation of the project ➤ Organize training programs ➤ Check and accept the project ➤ Organize the monitoring and appraisal 	<ul style="list-style-type: none"> ➤ Realize ecological sustainability ➤ Raise land efficiency and production ➤ Increase rural households' incomes ➤ Are conducive to ecological, social and economic growth of the province 	

5. Major Findings in Social Impact Assessment

5.1. Preparations at the early stage of the project

At the preparation stage of the project, we adopted a participatory method to launch a wide-spread promotion campaign, handing out pamphlets to 17,367 rural households in 227 administrative villages. There were 4-8 townships in every county that had applied for the project, that is, 34 townships in the six counties with a total of 9,398 households in 216 villages. Keeping the objectives of the project in mind as well as other comprehensive factors, we finally selected 191 villages in 30 townships as project implementation villages (see Table 5-1-1).

Table One 5-1-1 : Summary of participatory design result

project county	Number of villages that received pamphlets	Number of households that received pamphlets	Number of townships that applied for the project	Number of villages that applied for the project	Number of rural households that applied for the project		Number of other forestry entities that applied for the project	Number of townships that were approved for the project	Number of villages that were approved for the project
					Rural households or other forest entities	Among them: rural households of minority ethnicity			
Lingshi	41	5038	5	35	2152	0		5	35
Fenyang	40	5640	8	37	5340	0	32	6	32
Liulin	38	3008	6	38	38	0	22	4	22
Hequ	29	901	5	29	2164		5	5	29
Shenchi	50	1890	6	48	1399		101	6	44
Baode	29	890	4	29	529		24	4	29
total	227	17367	34	216	11622		184	30	191

The final estimated project area is 20,221.56 hectares and the expected number of contracts to be signed is 2,445, with the single largest area

being 1,400.7 ha and the single smallest one 0.10 ha. Among them, there are 3,473.38 ha of plantation land coming from rural households, 15,608.18 ha from collective forest farms, and 1,140 ha from cooperatives (please see Table 5-1-2) .

Table Two 5-1-2: Summary of participatory design result

county	individual rural households		Village collective forests		cooperatives		Number of expected contracts	Maximum area of a single contract hectare	Minimum area of a single contract hectare
	number	Area of the project	number	Area of the project	number	Area of the project			
Lingshi	2152	3073.38					1688	15	1.82
Fenyang			32	3776.59			32	1400.7	0.44
Liulin	0	0.00	22	2930.35	0		22	428.02	19.61
Hequ			5	3554.6			29	276.63	9.26
Shenchi			44	2526.74	57	1140	101	235	10.76
Baode	529	400.00	24	2819.9			553	390.40	0.10
total	2681	3473.38	127	15608.18	57	1140	2445	1400.7	0.10

The project area include 14,212.84 ha of barren hills and lands, 410.92 ha of degraded shrublands, and 5,597.80 ha of land converted from grain production (please see Table 5-1-3).

Table Three 5-1-3: Summary of participatory design result

county	Barren hills and lands	Degraded shrubland	converted land
	Ha	Ha	Ha
Lingshi	916.49		2156.89
Fenyang	2623.11		1153.48
Liulin	632.00	410.92	1887.43
Hequ	3554.60		
Shenchi	3666.74		

Baode	2819.90		400.00
total	14212.84	410.92	5597.80

5. 2. Basic information about the project villages

The biggest village we had investigated has 612 households with 1,766 people, while the smallest natural village has only 30 households with 96 people. The maximum annual average income is 10,689 yuan and minimum is 2,000 yuan, with most villagers earning between 3,000 and 4,000 yuan. Villagers usually go out to work at coal mines or businesses in the vicinity of their villages. But in recent years, as a number of coal mines in Shanxi has stopped production and some businesses are not doing well, many villagers who had gone out for work have returned to their villages. As seen from the table below, in the investigated villages there is a nearly 50 percent discrepancy between the total population and labor force, in a large part because some young couples have accompanied their children for school in cities and, at the same time, work as migrant workers. They have been living in cities since their children were at the ages of 3 to 5 years old. Those who can afford schooling for their kids are usually well off financially, or the rich households. The young labor force in villages usually go out for work and the more people go out for work, the richer the household is, whereas there is little labor force and fewer people went out for work, the family is relatively poor and households with elderly and diseased members, in particular, are poverty-stricken.

Table 5-2-1: Permanent residents and labor force

village	total households	total population	Average net income (yuan)	Labor force	permanent labor force in village	Households with migrant workers	job description	workplace
Qiaojia (natural village)	104	289	2350	208	156	21	odd job	County seat
Yanyi	194	525	3000	380	200	30	odd job	county
Nanyuandi	230	652	10689	378			winery	township
Gaojiazhuang	612	1766	10357			50	migrant job	in the vicinity
Gaojiagou	459	1475	2300	750	80	323	construction, coal mine, odd job	colliery
Kudaogou (natural villag)	113	386	3050	57	35	50	Coal mine	In the vicinity
Wuhuachengbao	341	806	4200	365	205	85	odd job	County seat
Bailuquan	316	815	3450	580	120	118	construction	County seat, Inner Mongolia
Chenjiayao	30	96	2000			15	Migrant job	County seat
Xiejialing	120	310	4000	145	50	70	Migrant job	County seat
Wangjiazhai	86	298	2800	140	80	30	Migrant job	in the vicinity
Zhangjiahe	62	180	2000	80	20	20	Animal farming, cement factory, trade	In the vicinity

In talking with village leaders and villagers, the team learnt that the definition of poverty-stricken households, average households or rich households is decided in close relationship with how many young

members in the household go out for work, what kinds of jobs they hold, as well as in relation to whether a household has the elderly and diseased. That is to say it has a close correlation with ages of members of the family. Generally speaking, many businesses do not employ people who are older than 45 years old, and, therefore, many senior villagers will stop going out to find jobs. As seen from the table below, there is a vast discrepancy among different villages in terms of poverty. Where there are good factories in the vicinity of villages, there are more rich households while in mountainous area, where few people go out for work, the ratio of poverty-stricken households is relatively higher.

Table 5-2-2: Poverty intensity in project villages

village	Poverty household	Percentage in the village	average household	Percentage in the village	Rich household	Percentage in the village
Qiaojiashan(natural village)	25	24	58	55	21	20
Yanyi	45	25	135	70	10	5
Nanyuandi	34	15	184	80	12	5
Gaojiazhuang	62	10	489	80	61	10
Gaojiagou	400	87	50	10	8	3
Kudaogou (natural village)	28	25	67	60	18	15
Wuhuachengbao	78	22	240	70	23	8
Bailuquan	108	25	150	50	58	25
Chenjiaoyao	20	70	8	25	2	5
Xiejialing	110	92	10	8	2	2
Wangjaizhai	18	20	43	50	23	26
Zhangjiahe	20	33	22	33	20	33

All the investigated villages have village-level roads and easily accessible; every village is connected with electrical grid with clean drinking water

coming from tap water, wells or springs, all of which show that the infrastructural facilities are in place in these villages and suitable for the implementation of the project.

Table 5-2-3: Infrastructure in the investigated villages

village	village road	earth road	All households connected to electrical grid	Some of the households connected to electrical grid	Tap water	Well or spring	Clean potable water
Qiaojiashan(natural village)	1	0	1	0	1	1	1
Yanyi	1	1	1	0	1	0	1
Nanyuandi	1	0	1	0	1	0	1
Gaojiazhuang	1	0	1	0	1	0	1
Gaojiagou	1	0	1	0	0	1	1
Kudaogou (natural village)	1	0	1	0	1	0	1
Wuhuachengbao	1	1	1	0	1	1	1
Bailuquan	1	0	1	1	1	1	1
Chenjiayao	1	0	1	0	1	0	1
Xiejialing	1	0	1	0	1	0	1
Wangjiazhai	1	1	1	0	0	0	1
Zhangjiahe	1	0	1	0	1	0	1

Notes: 1 represents availability; 0 represents nil

5.3. Forestry conditions in the project villages

The investigation and field survey show that soil conditions in the project villages are suitable for afforestation, and there is a convenient distance between the lands suitable for afforestation and their villages, usually half an hour (one and one and a half kilometers) on foot. However, as some of

the villages (for example, Gaojiagou in Liulin) are relocated villages, the distance to the afforestation land is relatively long, but villagers expressed that this would not impact the implementation of the project as there are ample lands suitable for afforestation.

All the investigated project villages have plenty of lands, the property rights of which are clearly defined, and villagers have high motivation for the project, a solid foundation for the successful implementation of the project.

In all the project villages, there used to be forest plantations of different sizes between 13.33 ha and 100 ha, managed mainly by collectives and individuals, with saplings offered free of charge by county forestry bureaus and, in a small number of the villages, with seedlings cultivated by the villagers themselves. And the provided saplings mainly included Chinese red pines, oriental arbovitae, walnut, jujube, aspen, Chinese scholar tree, korshinsk peashrub. The labor for the plantation came from villagers themselves. As to the quality of provided saplings, most of the villagers rated 'good' and 'passable' and rural households have tradition and experience in planting trees.

Investigations show that villagers seldom if ever got technical services in previous afforestations and they thought that the species of trees were not good enough with poor economic benefit, inadequate maintenance and management, lopsided species of eco-friendly trees and retarded growth due to lack of water. From the feedback of the villagers, the team

concludes that previous afforestation efforts did not receive enough technical guidance and assistance, and the training of villagers, and that there were no village regulations and folk rules to maintain and manage the forests, leaving villagers with an impression that more attention was given to afforestation to the neglect of their maintenance and management.

In the implementation of this EIB project, not only should we respond to the wishes of the villagers in the afforestation, but also organize them to manage well these plantations, and we should also generate the necessary motivation of the villagers to take part in the project, hold training workshops on afforestation technology and disease and insect control and establish effective management mechanism with village regulations and folk rules.

5.4. Income structure of rural households

Investigation shows that compensations from doing migrant jobs contribute to 50-80% of the income structure, agricultural production income to 20-40%, and animal farming to 10-20%, for instance, some of the villages in Fenyang could receive up to 50% of their income from growing walnut trees.

Young men who were engaged in coal mining industry in Liulin accounted for 90%, but due to the closing of some of the local coal mines, these young men had returned to their villages and are working in the fields with a few of them doing odd jobs outside their villages. And their

incomes have been reduced from 50,000 yuan to 30,000 yuan per year. At present, many villagers have shown an intense interest in this project, thinking that they could increase their income simply by staying at home instead of going out. Especially so in villages in Liulin where there is a tradition of growing walnut trees, and they want to have good species of walnut saplings to improve their existing species.

5. 5. EIB project activities

The investigation team has seaked villagers' opinions and suggestions to the EIB project. Every investigated village has given a definite yes to whether there are land suitable for afforestation. Besides, these suitable lands are also suitable for large-scale operations. Each village has suggested its species of trees that is easiest to grow in their villages. The labor force for the project in the villages are ample. As to the question of who should organize the afforestation program, 90% of the answer is given to the villagers committee. Villagers who are financially poor are willing to sign up for the project and even women have shown their willingness to take part in the project. It should be pointed out that women had shown a readiness to participate in other activities in the project and that a few of them even suggested that women empowerment program be provided like technical training to increase their economic incomes. The investigation also suggests that in poverty-stricken villages, due to the fact that the education level of villagers is not very high with a

high rate of illiteracy, women do not have much of a say in their families and male members are basically decision-makers in matters of importance, which shows that women's position in family and society is not very high. Therefore, we should put a premium on women's participation and add women empowerment programs like training workshops to the project.

5.5.1. Awareness level to the EIB project

The higher the awareness level of the EIB project villagers have, the more wide-spread the project activities are, and the better job we have done. In discussions, the vast majority of the villagers knew the EIB project and they got the news from villagers committees. Villagers in all the investigated project villages expressed their satisfaction to the mode of operation of the EIB project. They think that the EIB project will bring them labor income and produce revenue and improved ecological environment in their localities. Villagers in the project villages arrived at a consensus that the saplings for plantation be provided by forestry authorities. (Please see attached Table 5).

5.5.2. Rural households' participation awareness of the project

Investigations show (refer to attached Table 6) that there is an increasing awareness of the villagers to participate. As to the question of whether or not the government should consult with rural households' opinions when it meets with problems in making decisions on the project, it is a

resounding yes, that is to say, rural households' opinions must be consulted with should problems crop up. Villagers have high motivation for the project, and their overall answers are in the affirmative to sign up for the project. In the project activities, villagers asked for choosing their own species of trees to plant and, if the plantation will be in their own plots of land, they are willing to choose species of their liking. The great majority of the villagers had chosen forestry teams to maintain and manage the forests and, when the saplings are alive and kicking, the job could be handed over to them, about which only two villages had expressed reservations.

All the project villages are of the opinion that women should take part in all the activities of the project and, in villages where male members leave their villages for work, women become a major force in the afforestation. Some of the villages have their own all-women forestry teams. The EIB project put a premium on participation by villagers and will consult with villagers and seek their suggestions at each stage of the project implementation. Through group discussions, the project has guided villagers gradually to the awareness of the mode of operation and management, the merits and demerits that different operations might have brought to the project, and roles and functions of forests and let them compare notes so that all the villagers in the project villages would have a better understanding of the entire process of the project implementation

and increase their participation awareness so as to plunge themselves into the project in a conscientious manner.

In the process of the project implementation, project designers should direct villagers's attention to the inappropriate afforestation and maintenance and management measures that might bring negative impact on the environment and pay equal attention to both the positive effect the implementation of the project could bring and the negative effect that improper implementation of the project could bring to local villagers.

5. 5. 3. Rural households' choice of tree species

As the EIB project is about forestry, the species of trees to be planted are of a direct bearing on the motivation of rural households to participate in the project. During the implementation process, we should always keep in mind their willingness and let them be the decision makers, a guarantee for the success of the project. As different groups in different regions have different needs for tree species, the social impact assessment team adopted a participatory ranking and scoring method to direct them to have preliminarily chosen their species of trees of their liking. As seen from the list of species of selected trees, we can see that most of the rural households have chosen fruit trees instead of others, but a few have chosen ecologically-friendly trees, which represents the thinking of most rural households. Some of the rural households, however, put into consideration the fact that their land to be planted was far away from their

home and fruit trees would be difficult to manage, but also land conditions, climate pattern, water accessibility, and habitats, among other factors. As a result, when these rural households considered what trees they would plant, they have chosen the ecologically-friendly trees like Chinese red pines and oriental arborvitaes in preference to fruit trees.

Table of selected tree species

Project county	township	village	Selected tree species (in order of preference)
Lingsh	Nanguan	Qiaojiashan(natural village)	walnut> jujube> Chinese scholar tree > oriental arbovitae> Chinese red pine
	Liangjiayan	Yanyi	oriental arbovitae> walnut > lacebark pine> jujube> black locust
Fenyang	Lijiazhuang	Nanyuandi	walnut> oriental arbovitae> aspen/weeping willow
	Yangjiazhuang	Gaojiazhuang	Chinese red pine> walnut> apricot> aspen/weeping willow
Liulin	Liuyu	Gaojiagou	walnut> black locust> apricot
	Jinjiazhuang	Kudaogou (natural village)	walnut> apricot> pine
Hequ	Xunzhen	Wuhuachengbao	apricot> nectarine > peach> walnut> crabapple> Chinese red pine> cypress
	Louziying	Bailuquan	jujube> crabapple> apricot
Shenchi	Dayanbei	Chenjiayao	Chinese red pine> korshinsk peashrub > dragon spruce
	Liebao	Xiejialing	Chinese red pine> korshinsk peashrub> sea-buckthorn > sour jujube
Baode	Yaogetai	Wangjaizhai	Chinese red pine> oriental arbovitae> pear/ pear jujube> walnut (difficult to store in winter)> apple
	Yaowa	Zhangjiahe	oriental arbovitae> Chinese red pine> korshinsk peashrub> apple> pear jujube/black locust

5. 6. Social gender analysis of the project

Our investigation shows that what the women in villages do most are household chores, cooking, and taking care of children and the elderly.

As male members of the family leave villages for work, some of the

women undertake the farming work in the fields and tree planting, and a few of them even herd sheep. As most male villagers go out to find work (long-term and short-term), senior members in villages would stay at home working in the fields, planting trees, herding sheep, selling produce or engaging in other sideline jobs.

Table 5-6-1 : Social gender analysis in the investigated villages

productive activities	Qiaojia-shan	Yanyi	Nanyuan-di	Gaojia-zhuang	Gaojia-gou	Kudoa-gou	Wuhua-chengbao	Bailu-quan	Chen-jiayao	Xiejia-ling	Wangjia-zhai	Zhang-jiahe
Who decides forestry activities	m	m	m/f	m/f	m	m	m	m/f	m/f	m/f	m/f	m/f
Who tills land	m/f	m/f	m/f	m/f	m	m	m/f	m/f	m/f	m/f	m/f	m/f
Who takes part in forestry activities	m/f	m/f	m/f	m/f	m	m	m/f	m/f	m/f	m/f	m/f	m/f
Who attends training workshop	m	m/f	m/f	m/f	m	m	m	m	m/f	m/f	m/f	m/f

As can be seen from Table 5-6-1, in the project-related activities, the question of who takes part in forestry activities, the answer is mostly male and female villagers take part in the activities together, except for few villages where only male members participate. The investigation shows that women in these villages have little schooling and therefore seldom share the decision makings in the family matters of importance ; they think forestry and technical training are the preserve of male members, and that they only do household chores like in Liulin. But the

investigation also shows that in many villages, the number of women who are engaged in forestry activities is greater than males, like in Yanyi, Lingshi.

During the investigations of the project villages, the team also analysed gender role in forestry and agricultural activities (please see Table 5-6-2). At present, most of the male villagers under the age of 45 years old will go out for work and leave the forestry and farming work to their female members. In farm produce sales, males play a dominant role, which shows that the male members are the decision makers in matters of importance in the family while female members seldom take part in farm produce sales because they know little of the world and not as sophisticated. But they play an indispensable role in weeding, tree pruning and applying insecticide and harvesting farm produce and forestry products.

Table 5-6-2 : Table of gender in labor force distribution in project villages

activities	Male %	Female %	conclusion
weeding	50	50	male and female participate
pruning	60	40	More males than females participate because of techniques are involved.
Insecticide application	30	70	Females undertake the work when males are absent at home.
harvesting	50	50	Males and females share the work
sales	80	20	Males are in charge of the sales because they are good at calculations.

An analysis suggests that women are relatively in a weak position in decision makings whereas men are major decision-makers. Women take part in all other activities in the project and even act as the major implementers of the project in villages where most males have gone out for work. As a result, in each stage of the project implementation, we should increase women empowering programs and encourage them to be decision makers in such matters as what species of trees should be planted, in which land they should be planted, and how many mu of land would be used for such plantations. We should listen to their suggestions and opinions and provide specific training workshops for them.

5. 7. SWOT analysis of the project implementation

The social impact assessment team has conducted an analysis of the project in terms of its strengths, weaknesses, opportunities and risks (please see attached Table 8). Its result shows:

The strengths of the proposed project are:

- ✓ plenty of available land;
- ✓ a wealth of experiences;
- ✓ suitable climate conditions,
- ✓ high economic revenue;
- ✓ villagers' willingness to implement the project;
- ✓ willingness for afforestation from households with large tracts of land;
- ✓ villagers' desire to improve the ecosystem;

- ✓ having more time for farmers to go out for work.

The weaknesses of the proposed project are:

- ✓ possible land rivalry between grain growing and tree planting;
- ✓ lack of skills;
- ✓ in shortage of water;
- ✓ in shortage of labor force;
- ✓ difficulty in afforestation due to poor transportation;
- ✓ possible tension between afforestation and animal husbandry in a few areas;
- ✓ difficulties in maintenance and management;
- ✓ possible negative effect on sales due to poor transportation;

Opportunities of the proposed project are:

- ✓ to carry water;
- ✓ to dig wells;
- ✓ to lay down village regulations and folk rules to solve the conflict of interest between afforestation and animal husbandry;
- ✓ easy to manage timber forests;
- ✓ to tap into forest farming and non-timber forest products;
- ✓ to solve the problem of labor shortage by unified planting and management by dedicated professionals.

Risks of the proposed project are:

- ✓ potential quarrels about benefit distribution if rural households with large tracts of land borrow the contracted land from farmers;
- ✓ potential natural disasters like insect pests, rabbit pests, frost damages to flowers and fruits;
- ✓ failure in afforestation resulting from lack of water;
- ✓ failure resulting from poor maintenance and management;
- ✓ potential conflicts between afforestation and agriculture;
- ✓ sales risks when fruits are harvested.

5.8. Impacts on different rural households

In the investigated villages, the maximum income is 10,689 yuan and minimum is only 2,000 yuan, with most earning between 3,000 and 4,000 yuan. And most of the young and able-bodied have gone out for work. The more members of the family go out for work, the richer the household is, while due to lack of labor force in the family and few members going out for work, the household remains poor, and especially those households with elderly and diseased members have become the poverty-stricken households.

The proportion of super rich rural households in the project area is small and these rural households are often engaged in trade and coal mining. These households may show little interest in the project but they still have land and might get benefit from the project. Median-rich households,

average-income households and poor households are in the majority, and as their incomes come mainly from doing migrant work and farming, the implementation of the project would increase their incomes including fruits harvest and some labor compensation, in addition to the reduction of work load in the fields, and thus having more time to go out for work. These households could be the beneficiaries of the project. The proportion of the extremely poor households is not high and most of these households are in shortage of labor force, but if they have land, they could also become beneficiaries of the project.

5. 9. Impacts on income structure of the rural households

The main source of income for most rural households in project area is doing migrant work and farming. Usually a migrant worker can earn 30,000 yuan per year; as for farming, let's take corn growing for example: one hectare needs an investment of 3,750 yuan in chemical fertilizer, 300 yuan in seed, 750 yuan for tilling land, 750 for weeding, 300 for sowing, 300 for applying fertilizer, 900 for harvesting, and 240 for shucking, totalling a combined investment of 7,290 yuan. If one hectare can yield 6,000 kilograms of corn, and one kilogram sells for 1.6 yuan, it can generate 9,600 yuan. If we deduct the investment, the net income becomes 2,460 yuan. If one household grows one hectare of corn, it can receive 2,460 yuan. The combination of migrant work and corn growing can get 32,460 yuan per household.

Let's take growing walnut trees for example. According to the calculations by experts, a quality walnut tree could yield fruits in 4-5 years and reach full fruit period in 7-8 years ; a hectare of walnut trees can harvest 2,100-3,360 kilograms of walnuts. If one kilogram of walnut sells for 30 yuan, a hectare can earn between 63,000 and 100,800 yuan. Besides, the investment in growing walnut trees is not as big as growing grain and could generate far more revenue. Addition to that, with the growing of walnut trees having taken the place of grain-growing, these rural households could save labor and have more time going out for work.

5.10. Suggestions to the project by rural households

The investigation team has collected some suggestions to the project by villagers in the project area. Please see Table 5-10-1.

Table 5-10-1 : List of suggestions to the project by villagers

village	Suggestion
Qiaojiashan	Households with large plots of land could plant trees in large continuous land, which is easy to manage.
Yanyi	Households with large plots of land could be given even larger area of land so as to increase their proportion and their revenue.
Nanyuandi	The standards for ecological trees be swapped for those of fruit trees to raise the standards of ecological trees as they are expensive to maintain and need much water.
Gaojiazhuang	The standards for ecological trees be swapped for those for fruit trees as the site conditions for ecological trees are generally poor, which will cost much to water them, and saplings are big, which may raise their preserving rate. Fruit trees tend to be grown in

	good plots of land and have access to water, which cost less.
Gaojiagou	<p>1. They want good species suitable for their site conditions like walnut trees and that the project could make the best use of the gully land;</p> <p>2. they could be provided techniques for disease and insect control and tending techniques;</p> <p>3. an impounding reservoir could be built as there is no road and water up in the mountain.</p>
Kudoagou	<p>1. They want good species of trees that are suitable for their site conditions ;</p> <p>2. they could be provided with insect and disease control techniques and tending techniques.</p>
Wuhuachengbao	<p>1. More attention would be devoted to mainenance than afforestation ;</p> <p>2. they could be provided with irrigation equipment as regular watering could be a problem.</p>
Bailuquan	<p>1. They could be given water pumps and an impounding reservoir could be built at the top of the mountain to solve irrigation problem ;</p> <p>2. farmers would be guided to learn fruit tree management and reprocessing techniques through the implementation of the project.</p>
Chenjiayao	They are willing to plant Chinese red pines and other fruit trees and that collective planting and management of trees would be adopted in future forestry programs.
Xiejialing	They are willing to plant Chinese red pine, korshinsk peashrub, and other fruit trees and that collective tree planting and management would be adopted in future forestry programs.
Wujiazhai	<p>1. Incomes would vary as little as possible ;</p> <p>2. technical personnel could participate and be provided with technical services.</p>

Zhangjiahe	<ol style="list-style-type: none"> 1. They are willing to plant fruit trees and that to increase the scale of fruit tree planting on continuous mass of land could be increased in future forestry program ; 2. more trees with economic value would be planted.
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6. Social Risk Analysis

6. 1. Discrepancy between ecological conservation and farmers' income

The investigations show that villagers have a deep understanding of the fact that the afforestation activities would improve local ecological environment and control soil erosion. But on the other hand, they had a higher expectation for increasing their income. From questionnaires, we can see that most rural households are paying more attention to the increasing of their economic revenue than the protection of ecosystem, hence the risk of over-attention to economic income at the expense of ecological preservation. As a result, we should actively coax villagers to see the importance of timber forest resources, the enhancement of forest resources quality and the preservation of tree species diversity, on the basis of which, rural household's income could be increased.

6. 2. Participation opportunity discrepancy between households with large tracts of land and average households

Besides the mode that villagers plant trees in their own plots of land, there are afforestations by households with large plots of land and

collectives. A good case in point is in Qiaojiashan village of Lingshi, where plots of land were transferred to the so-called “big households”. In this EIB project, these large-scale households could get much more opportunities than small-scale rural households and receive capital input, training, and ultimately benefit from products while the rural households who have leased their lands could benefit only from rental fee. In this project, large-scale households and small-scale households are unequal in getting opportunities and benefit. So in the implementation of the project, we should try to be equal and impartial and could not be partial to large-scale households and, instead, should look after the benefits of a broad spectrum of average households.

6. 3. Marginalization risk of vulnerable social groups

In our survey in villages, we have found that women constituted nearly half of the labor force in the villages. As most of households, mostly male members, go out for work, women would usually stay at home in most time of the year, which gives us a glimpse into the important role that women could play in the fields. But in our survey, we found that traditional concepts had, to large extent, prevented women from participating in the project. Despite the fact that women shoulder the great majority of the field work, the role they have played could not be recognized. Women seldom attended the meetings held by this social assessment team. The conventional concept holds that women should stay

at home taking care of household chores, children, elderly persons and should not go outside. As to the technical training workshop and decision makings, they should be left to men. If so, women could be easily marginalized and would not have received the technical training that they deserve and, as a result, would not be able to be in a position to make decisions.

Another easily marginalized social group is poverty-stricken households, those families that usually have no labor force, and could be neglected in the implementation of the project. Having said that, they have the right to participate and, in its implementation, their benefit should not be encroached upon and they should also be consulted with.

7. Suggestions to the Project Implementation

7. 1. Rural households should apply for the project of their own volition.

The project will be carried out on rural households' contracted land and, in spite of the benefit the project could bring to them; their willingness should be respected as they will be the ultimate implementer of the project. Whether rural households would like to sign up for the project should be decided by rural households themselves and only this way could the project be implemented well and achieve the expected results.

7. 2. Participatory consultation method should be adopted in the implementation of the project.

The participatory method ensures a correct approach to project participation by all target groups in a willing and equitable manner. We

should make sure that beneficiaries could take part in the decision making, including the identification of the project, deciding the scale of afforestation, maintenance and management mode, as well as the mitigation measures to be adopted so as to avoid or eliminate the potential impacts on the livelihood in the implementation of the project. For the purpose of this project implementation, Shanxi Forestry Project Management Office for International Finances has compiled a specific participatory consultation booklet and we suggest that the project should be carried out, to the extent possible, according to the booklet in order to guarantee the success of the project.

7. 3. Tree species should be scientifically designed to suit the project area.

In previous afforestation programs, some failed precisely because of the improper choice of tree species. In this project implementation, we should, keeping in mind local site conditions, design tree species scientifically, and make sure that species are suitable for the soil. In addition, we should be concerned with their livelihood and design, to the extent possible, the species of trees that would generate economic benefit, so that they would get benefit economically and ecologically.

7. 4. Villagers in the project area should be encouraged to formulate village regulations and folk rules.

“30 percent afforestation, 70 percent maintenance and management” goes the saying. In the process of the project implementation, afforestation

may be important, but bad management could result in its failure. Our investigation finds that there are still conflicts between afforestation and animal husbandry and that villagers were worried about the difficulties in protecting afforestation achievement. So from the start of the project implementation, we should get fully prepared for all possible and potential risks. Village regulations and folk rules come in handy. We should encourage villagers formulate village regulations and folk rules, and improve their motivation so as to do a good job in protecting afforestation land and the project achievement.

7. 5. Local rural households should get necessary technical support.

Although local farmers have some experience in tree planting, these experiences are not good enough to implement the project. Villagers are of the opinion that they are lacking in technical knowledge and that they need government support in this regard. Technical personnel may provide technical training for villagers, especially for women. Another way is to put technical personnel under technical contracts.

7. 6. Rural households should be backed up with necessary information.

The implementation of the project includes the planting and management of fruit trees, which requires information assistance in market and policies. Relevant authorities in counties should communicate with villagers and provide necessary information conducive to their development.

7. 7. Enough attention should be paid to the capacity building of institutional staff.

In the process of the project implementation, we should satisfy all the interests of the stakeholders so as to ensure that they would fulfill their obligations. The investigation shows that the institutional workers in the implementation institutions wish that they could raise their capacity building through the implementation of the project. Therefore, in the process of the implementation, we should pay enough attention to the capacity building of the stakeholding institutions and satisfy their benefit and needs.

7. 8. Localities with good transportation system should be selected for the implementation of the project.

Our investigation finds that many of the plots of land villagers have chosen for afforestation are inaccessible and difficult for plantation activities. So in the design stage, we should select, to the extent possible, those lands that are easily accessible to mitigate the difficulty in the afforestation and plantations. As for fruit tree planting, it is especially important to select those plots of land with good transportation.

7. 9. Social impact monitoring and appraisal should be adopted.

The purpose of the European Investment Bank-financed Forest Ecological Restoration Project along the Yellow River Valley of Shanxi Province is to restore ecosystem and, at the same time, to generate monumental social, economic benefit as an exemplary project. So, in the

project implementation, we should exercise social impact monitoring and appraisal in a timely manner, so that the merits of the project could be propagated and that the existing problems could be solved and corrected. The monitoring team should be composed of social impact assessment experts, staff from counties and townships, and villagers.

7. 10. Agroforestry should be practiced.

The investigation finds that there is a possibility that the land that used to grow grain might be converted to plant fruit trees in some villages, which will result in a land rivalry between grain and forest. If fruit trees are planted in farming lands, this could result in the reduction of grain production and, therefore, impact their means of livelihood. In the project implementation, agroforestry should be adopted to the extent possible so as to increase their income and, at the same time, reduce grain production to the minimum extent necessary.

7. 11. Farmers' professional cooperatives should be established.

Our investigation shows that there is a general lack of labor force in villages and that villagers are worried about how to manage their forest land. There are a lot of favorable policies in place for farmers' professional cooperatives, which are suitable under the current situation in rural villages. The establishment of farmers' professional cooperatives could form a kind of synergy that could mitigate risks and address the problem of lack of labor force in some households. So in the project

implementation, we should encourage villagers to form professional cooperatives.

Appendix Table 1:

project province	project county	average income (yuan/year)	NFPP project ? (yes/no)	poverty-stricken county (national/provincial/ None-poverty-stricken)	land topography (mountain/ plateau/ basin/plain/hills)	Minority ethnic group	Minority people ratio in county %	Previous world bank projects ? (NAP/FRDPP /FDPA/SFDP)	key forestry ? (yes/no)
Shanxi	Lingshi	11913	yes	poverty	mountain		0	yes	yes
Shanxi	Fenyang	9901	yes	none-poverty	mountain/hills/ plain			no	
Shanxi	Liulin	9167	yes	provincial level	mountain		0	yes	
Shanxi	Hequ	3386	yes	national	hills			IFDP	
Shanxi	Shenchi	5353	yes	national	hills		0	yes	
Shanxi	Baode	3815	yes	national	hills			participated	

Appendix Table 2

Interviews with Village Heads

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiazhuang	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiayao	Xiejialing	Wangjiazhai	Zhangjiahe
Are there any suitable lands for plantation?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
What is the size of the land?	1000-mu mountain land and 700-mu abandoned land		2160 mu	3000-40000-mu barren land and hilly land	6000-mu ecoforest and 3000-mu fruit trees	300-mu barren slopes	3000 mu	5000-6000 mu		6000 mu	2000 mu	2000 mu
Are there any suitable lands for scale operation?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Are there any suitable trees for planting?	walnut, jujube, black locust, oriental arborvitae, ailanthus	Lacebark pine, oriental arborvitae, aspen, willow, black locust	walnut, Chinese red pine, oriental arborvitae, aspen, willow	walnut, oriental arborvitae, willow, scholar tree	walnut, jujube, oriental arborvitae, willow, aspen	walnut, black locust, oriental arborvitae, apricot, yuhuang plum, jujube	chinese red pine, oriental arborvitae, aspen, apricot	chinese red pine, oriental arborvitae, locust, oil jujube	korshinsk peashrub, chinese red pine, black locust, jujube, pear, aspen	korshinsk peashrub, chinese red pine, sea-buckthorn, sour jujube	chinese red pine, oriental arborvitae, crabapple, aspen	korshinsk peashrub, chinese red pine, oriental arborvitae, black locust, jujube, pear, aspen
Is there ample labor for plantation?	Yes, but can hire labor at 120 yuan/day, there are more males than females	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Who organizes the plantation?	Village committee	Village committee	Village committee	Village committee	Village committee	Project team	Village committee	Village committee or self	Village committee	Village committee	Forest ranch	Village committee

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiazhuan g	Gaojiagou	Kudaogou	Wuhuache ngbao	Bailuquan	Chenjiayao	Xiejialing	Wangjia zhai	Zhangjiahe
Are there any benefit from EIB project?	Income from labor and products	Income from labor and products	Income from labor and products, etc	Income from labor and products, etc	Income from labor; improvement on environment and	Income from lablr and environment imporovement	Income from labor and products	Income from labor and products	Income from labor and forestry land	Income from labor and timber product	Income from labor	Income from labor
Would the benefit be the same to the poor and rich?	Yes, both the poor and rich get the same benefit.	No or little impact on rich households	little impact on the rich	no impact on households with average income of tens of thousand yuan per head	The same	The same	The poor could get more benefit than the rich.	The poor could get more benefit than the rich.	almost the same to the poor and rich	almost the same to the poor and rich	The rich could get more benefit than the poor.	The poor could improve their life and the rich increase income.
Are there any negative effect?	The project could transmit harmful organism	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
Who would like to sign up for the project?	the poor and median-income households could get more benefit.	poor and median-income households	poor and median-income households	Poor and median-income households	Both are willing.	Both are willing.	Poor and median households	poor and median household.	Poor and median households	the poor and median-income households	Poor and median households	poor and median-income households
Are the poorest willing to sign up for project?	Yes. The poor account for 60% in village.	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Are women willing to sign up for project?	Yes. There are few women left in village.	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Are women willing to attend other activities?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Appendix Table 3

Education of villagers in project village

project county	township	village	Illiterate /semi-illiterate	Primary school	Junior middle school	senior middle school	above senior middle school
Lingshi	Nanguan	Qiaojiashan(natural village)	3	29	212	25	20
	Liangjiayan	Yanyi	35	380	70	13	7
Fenyang	Lijiazhuang	Nanyuandi	12	195	261	128	56
	Yangjiazhuang	Gaojiazhuang	34	528	706	348	150
Liulin	Liuyu	Gaojiagou	363	298	413	224	177
	Jinjia	Kudaogou (natural village)	39	134	113	62	38
Hequ	Xunzhen	Wuhuachengbao	115	120	300	90	130
	Louziying	Bailuquan	300	80	310	70	55
Shenchi	Dayanbei	Chenjiayao	6	72	13	5	0
	Liebao	Xiejialing	8	241	46	15	0
Baode	Yaogetai	Wangjiazhai	120	90	50	25	13
	Yaowa	Zhangjiahe	10	142	18	8	2
		total	1045	2309	2512	1013	648

Appendix Table 4

Forestry conditions

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiazhuang	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiayao	Xiejialing	Wangjiazhai	Zhangjiahe
How many mu of forest plantation are there in village?	200 mu	200 mu	200 mu	1000 mu	1000 mu	400 mu	2060 mu	1500 mu	2500 mu	100-200 mu	100 mu	1100 mu
What is the present mode of operation for forest plantation in village?	managed by oneself	collective and household	collective	collective	delegate to individual household	delegated to individual household	3 persons in county+2 persons in village+forest fire fighting members	Managed by oneself	no management	no management	no management and only one fire fighting man	korshinsk peashrubs that need no management
Were the plantation saplings in village free of charge?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Where did you get the saplings?	bought by villagers	county forest bureau	forest bureau	county forest bureau	Given by county forest bureau	forst bureau or station	forestry agency	seedling cultivation by individuals and then transplant them	forestry bureau	forestry bureau	forestry bureau	forestry bureau
How many species of forest trees are there?	walnut, jujube, aspen, black locust, oriental arborvitae, Siberian elm	black locust	chinese red pine, cypress	chinese red pine, oriental arborvitae, aspen, willow, chinese scholar tree	walnut, korshinsk peashrub, black locust	walnut, chinese red pine, cypress, black locust	walnut, chinese red pine, oriental arborvitae, aspen	chinese red pine, cypress, jujube, aprico	chinese red pine, korshinsk peashrub, aspen, willow	chinese red pine, korshinsk peashrub, seabuckthorn, sour jujube	chinese red pine, cypress	korshinsk peashrub
How about quality of saplings?	average	good	good, new species	good	good	good	good	average	good	good	good, new species	good
Who was labor force for plantation and seedling	households	household	household	collective	household	household	hired labor	household	household	household	household	household

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiashu	Gaojiagou	Kudaogou	Wuhuachen	Bailuquan	Chenjiayao	Xiejialing	Wangjiaz	Zhangjiah
tending												
Are there any rules for harvesting forest products, timber, as well as grazing?	Forest ranch has rules that Hujiatan is off limits.	No	No	No	There are rules for grazing prohibition, but no rules for harvesting.	Yes	No	No	No	No	No	No
Did the village have any forestry project?	Yes, World Bank walnut forest (destroyed by mining subsidence)	Yes	No	No	No	Yes, Japanese yen project and Sanbei protection belt forest	Yes, reforestation, Jingjin sandwind and corridor green belt and bank protection	Yes, Lanzhou apricot project	Yes, small watershed management	No	No	No
Was previous forestry project only for tree plantation?	walnut and other fruit trees	shelter forest and locusts	Chiese red pine, oriental arborvitae, Chinese scholar tree, bushes, korshinsk peashrub	No	No	Walnut and other fruit tree (yen), black locust (Sanbei)	fruit trees, shelter forest	apricot	Chinese red pine, korshinsk peashrub	No	No	No
Were there any problems in previous forestry projects?	poor species, lack of labor and bad result	bad result	No	No	No	bad result, poor management, single species of ecotree, and retarded growth due to lack of water	lack of labor and bad result	bad result	No	No	No	No
Did you get any forestry technical support?	No	No	No	No	Yes	Yes	Yes, from forestry agency.	Yes, from forestry agency.	No	No	Yes, forest ranch offered	No

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiazhuang	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiayao	Xiejialing	Wangjiazhai	Zhangjiahe
											training	
If yes, what service did you get?	No	No	No	No	plantation, transplant, and insect control	plantation, transplant, and insect control	plantation	transplantation	No.	No	plantation	no
Who provided technical services?	No	No	No	No	country and township forestry agencies	forestry agency	forestry agency	forestry agency	No	No	Forestry agency	No
Were there any accidents happened in forest plantation?	No	No	No	No	No	No	No	No	No	No	No	No

Appendix Table 5

EIB Project Awareness Survey

Question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiazhuang	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiayao	Xiejialing	Wangjiazhai	Zhangjiahe
Do you know the EIB project?	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes
Where did you get the news?	township government	village and township	villager committee	village committee	township government	township government	township government (forestry bureau)	township government	villager committee	villager committee	township government	village committee
Are you satisfied with project operation mode?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
What benefit do you think you can get from EIB project?	labor income, product revenue	labor and economic revenue and others	labor and product revenue	labor and product revenue	labor and product revenue, environmental improvement	labor and product revenue	labor and product revenue	labor and product revenue	labor income	labor income	labor income	labor income

Who do you think should provide saplings, forestry agencies or households?	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency	forestry agency
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Appendix Table 6

Rural Households’ Project Participation Awareness Suvey

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiaya	Xiejialing	Wangjiazhai	Zhangjiahe
Should the government consult with households when meeting with problems?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Are you willing to sign up for project?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Are you willing to choose tree species for plantation by yourself?	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	
Are you willing to choose plantation land by yourself?	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
How many	50	16		6	1	1	2			1	Collective

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiaya	Xiejialing	Wangjiazhai	Zhangjiahe
plots of land are you willing to plant?											land
How many mu of land are you willing to plant?	1000 mu	30 mu		15 mu	5 mu	Several dozen mu	10-20 mu			14-15 mu	To be decided by village
What tree species do you like to plant?	walnut, jujube, Chinese scholar tree	walnut	walnut, chinese red pine, oriental arborvitae	walnut, jujube, cypress, chinese red pine	walnut, jujube, apple, black locust, cypress	apricot, peach, crabapple	apricot, jujube, crabapple	nil	nil	Like crabapple	like jujube, pear, etc.
Are you willing to buy saplings by yourself?	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No
Did you take part in forest ranch's or company's afforestation program?	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
Do you think it is a good method to hand over management to farmers when the trees are alive?	No	Yes	Fruit trees should be self-managed	Yes	Yes	Yes	Yes	No	No	Yes	No

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiaya	Xiejialing	Wangjiazhai	Zhangjiahe
Do you think women should participate in the project?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
What technical service do you think should be provided?	pest and disease control, pruning, management skill	walnut tree management skill	pruning, management skill	pruning, fruit tree management, disease and pest control	pruning, fruit tree management skill	management skill	pruning, management skill	afforestation and tending management	afforestation and tending management	pruning, management skill	fruit tree cultivation and tending management
What do you think is the most effective operation and management mode?	by cooperatives	by cooperatives as there is a walnut cooperative	by united households	by self or collective	by united households	by united households	by collective	by united households	by united households	by united households	by united households
Please state the merits and demerits of different operation modes.	Self-management is not uniform and can not prevent other household's animals from destroying forest and labor intensive. Collective-management is better as it can save labor.	Cooperative-management is better.	Fruit trees should be managed by oneself while ecological trees are managed by the collective	Self-management is not uniform and can not prevent other household's animals from destroying forest. United household management could exercise uniform management and raise collective protection awareness.	Self-management is not uniform and can not prevent other household's animals from destroying forest. United household management could exercise uniform management and raise collective protection awareness.	Self-management is not uniform and can not prevent other household's animals from destroying forest and labor intensive. United household management could exercise uniform management and sales and	Self-management is not uniform and can not prevent other household's animals from destroying forest and labor intensive. United household management could exercise uniform management and save labor.	As we have plenty of land and a small population, plantation should be in collective land and managed by the collective.	As we have plenty of land and a small population, plantation should be in collective land and managed by the collective.	Self-management is not uniform and can not prevent other household's animals from destroying forest. United household management could exercise uniform management and raise collective protection awareness.	If planted in collective land, household could get labor income, if in our land, we could have forest property right.

question	Qiaojiashan	Yanyi	Nanyuandi	Gaojiagou	Kudaogou	Wuhuachengbao	Bailuquan	Chenjiaya	Xiejialing	Wangjiazhai	Zhangjiahe
						coud save labor.					
Could you state what effects and functions a forest has?	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can improve ecosystem and mitigate climate warming.	It can increase economic revenue, conserve water and soil, improve ecosystem and develop tourism.	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can increase economic revenue, conserve water and soil, improve ecosystem.	It can increase economic revenue, conserve water and soil, improve ecosystem.	It can increase economic revenue, conserve water and soil, improve ecosystem and benefit posterity.	It can increase economic revenue, conserve water and soil, improve ecosystem.
What kinds of improper afforestation and maintenance and management measure could bring negative impact on the environment?	alien species as the introduced elm could not become timber	Aspen and locust could impact the growth of walnut tree and have diseases and elms have aphid insects.	Nil	Wild animals could destroy land if there are forests.	Nil	Nil	Nil	When there are lots of forests, professional management team should manage them.	When there are lots of forests, professional management team should manage them.	do not know	Animal herders should have their animals penned in.

Appendix Table 7

Major findings in the investigated villages

village	findings
Qiaojiashan (natural village)	<ol style="list-style-type: none"> 1. This is a village with households having large tracts of land for afforestation on mountainous areas connecting with several villages. These households borrowed land from local farmers under a contract, usually 100 yuan per mu per year. As their lands were borrowed, they wish to plant fruit trees, such as walnut trees to increase economic revenue. 2. There are 10,000 cypress trees, in addition to walnut trees of the World Bank project and there are coal mine subsidence area in neighboring villages, where there used to walnut growing. 3. The village has good natural conditions with clear river transversing through and as a result, some villagers had built the Zijingtan Vacation Village resort, which was on the land of the village. 4. Migrant workers account for 80% of the villagers and the elderly, diseased, disabled account for 20%.
Yanyi	<ol style="list-style-type: none"> 1. The village is located in Shigaoshan scenic area. 2. Existing tree species are lacebark pine, oriental arborvitae, black locust, walnut tree, jujube tree. 3. There were coal mines in the village and now are closed. There is a big gap between the poor and the rich ; village head used his own money to build some of the facilities in the village. 4. Villager remain relatively poor.
Nanyuandi	<ol style="list-style-type: none"> 1. The village is located in the landscaping area of Fenyang. 2. Existing tree species are walnut, Chinese red pine, oriental arborvitae, aspen, willow, and average households get their economic revenue from walnuts. 3. Since walnut planting and management skill are mature, mostly interplanted with grain, the cost is relatively low. As ecological trees are to be planted in mountains, and the preserving rate of small seedlings is low while large saplings cost much and difficult to be watered, villagers suggest that the standards of planting fruit trees be swapped with those of planting ecological trees. 4. Planting ecological trees would cost much more than planting walnut trees.
Gaojiazhuang	<ol style="list-style-type: none"> 1. The village is located in the landscaping area of Fenyang. 2. Existing tree species are walnut, Chinese red pine, oriental arborvitae, aspen, willow, and average households get their economic revenue from walnuts. 3. Since walnut planting and management skill are mature, mostly interplanted with grain, the cost is relatively low. As ecological trees are to be planted in mountains, and the preserving rate of small seedlings is low while large saplings cost much and difficult to be watered, villagers suggest that the standards of planting fruit trees be swapped with those of planting ecological trees. 4. Planting ecological trees would cost much more than planting walnut trees. 5. There were lots of small coal mines in the village and now are closed. So the environment is not good. It lies in the landscaping area of Fenyang. 6. Collectively-owned village enterprises are an edible fungi center, a freezing warehouse, a refrigerator truck, and an animal herding center.
Gaojiagou	<ol style="list-style-type: none"> 1. This is a relocated village where 90% of its young men or women have gone out for work and coal mines hire workers under the age of 45. 2. Male villagers usually go out to find work with their county. 3. There are walnut production here with one mu producing 400 kilogram. 4. Part of the barren lands have been contracted to 7 households and there are still 6,000 mu of baren land available in the village. 5. There are 3 households that raise sheep with an average of 80 sheep per household.

village	findings
Kudaogou (natural village)	<ol style="list-style-type: none"> 1. There is no irrigation facility in the village. 2. The general thinking of the villagers is that by afforestation, they could use more wood for fuel. 3. The odd job salaries are 150 yuan for men and 110 for women; originally, men could earn 50,000 yuan in coal mine but now only 30,000 yuan per year. 4. The survival rate for walnut trees last year was 80%. 5. There are a lot of black locusts growing in the mountains near the village but the villagers say those locusts are useless and could not become timber.
Wuhuachengbao	<ol style="list-style-type: none"> 1. There is no water source in the mountains and water has to be carried up to the mountain by truck. 2. Villagers have strong motivation and are willing to contribute labor. 3. Villagers often fell trees for fuel with as many as 5000 kilograms per household. 4. Women used to take part in afforestation and there were afforestation programs here. 5. The previous afforestation programs include 1) 130-mu grain-for-forest program ; 2) 55-mu shelter belt for Yellow River bank reinforcement ; 3) 56 mu of trees for road landscaping that are managed by forest workers from the county, township and village; 4) there are 170 mu of walnut trees, 1,600 mu of plantations on barren hills (700 mu of Chinese red pine, 800 mu of oriental arborvitae, and 100 mu of silver poplar, all of which are intended for dust-storm source control for Beijing and Tianjin area. 6. These trees were managed by forest workers and one year later the management was turned over to local forest station, i.e. three-level maintenance and management.
Bailuquan	<ol style="list-style-type: none"> 1. There is high-quality spring water in the village, which is yet to be developed. 2. There are well-growing sour jujube tree and apricot tree. 3. This village is easily accessible with good natural environment and has potential for tourism. 4. The selected species of trees (apricot, jujube and crabapple) by villagers are suitable for local soil conditions. 5. There is plenty of water sources but lack of water conservancy facilities. 6. Villagers have strong motivation and are willing to contribute to labor; in grain-for-forest program, some villagers cultivated seedlings by themselves. 7. The majority of women in the village are illiterate and wish to be offered literacy training as a primary school was closed in 2004. 8. There was no afforestation program. 9. Villagers wish to be given training in poultry farming.
Chenjiayao	<ol style="list-style-type: none"> 1. There was no grain-for-forest program in the village ; villager have just received the notice on collective forest tenure reform. There were 12 households remaining in the village and 20 households engaging in agriculture (worked as migrant workers and returned to grow grains when necessary) ; there are plenty of barren hilly lands in the village. 2. Korshinsk peashrubs were planted in 1986 and Chinese red pines in 1992, financed by water conservancy agency as small watershed treatment program. 3. The 300-mu drip irrigation facility was financed by water conservancy bureau and villagers should pay 40 yuan for one mu to use the facility. 4. There is a lack of fruit tree.
Xiejialing	<ol style="list-style-type: none"> 1. There was no grain-for-forest program in the village ; villager have just received the notice on collective forest tenure reform. 2. most villagers are animal herders with the majority raising sheep. 3. located at an upwind end, village have a wind power station.
Wangjiazhai	<ol style="list-style-type: none"> 1. Villagers' choice of species are Chinese red pine, oriental arborvitae. Due to difficulties surviving the winter, it is not suitable for growing walnut trees. 2. There a conspicuous conflict of interest between plantation and animal husbandry and urgent need to get sheep penned in. There is also a conflict of interest between afforestation and grain growing as land for afforestation tend to be far away from the village, hence the rivalry to grab land nearby. 3. Another issue is cost-effectiveness as planting trees and later management cost

village	findings
	<p>much more. Villagers here are reletively poor with single source of revenue but have strong motivation for afforestation.</p>
Zhangjiahe	<ol style="list-style-type: none"> 1. Existing species of trees are korshinsk peashrub, Chinese red pine, oriental arborvitae, black locust, jujube an pear. 2. There is no conflict of intere here as there is no household engaging animal husbandy. 3. There is, however, a conflict of interest between grain growing and afforestation as land for afforestation is usually located far away from the village and therefore arises a rivalry for nearby land that is used for grain. 4. Benefit issue: villagers used to grow korshinsk peashrubs with no obvious economic benefit. 5. The village is declared as a poverty village with single souce of evenue and poor transportation. The existing species of tree are jujube and pear trees that are difficult to sell.

Appendix Table 8

SWOT analysis of the project

village	strengths	weaknesses	opportunities	risks
Qiaojiashan (natural village)	The village has good natural conditions and beautiful scenery; big households with rich experiences are engaged in plantations that are easy to manage.	The village has poor transportation and is located far away from urban area. 80 % of villagers have gone out for work and the remaining 20% are either the elderly, the weak, the diseased or the disabled ; there is a general lack of labor and would hire people to plant trees.	It is adjacent to Shigaoshan tourist area, with high quality water; with no pollution, it is ideal for developing tourism.	As big households borrowed land from farmers under a limited-term contract, there exists, therefore, a risk of benefit distribution and management after the term expires.
Yanyi	Project will improve ecological environment, conserve water and soil, and increase labor introduction.	The village is not easily accessible and in shortage of water, resulting in a high cost for afforestation.	Ecological environment improvement	As it tends to be dry in spring, irrigation is a problem.
Nanyuandi	The project will improve ecological environment and conserve water and soil, beautify the scenery and increase tourist dollar.	The village has poor transportation and a lack of water, resulting a higher cost for afforestation.	The project could beautify scenery and improve ecological environment. It is possible to carry water up to the mountains. The barren hills are collectively-owned and could be planted with a unified plan with professional management and collective dividend distribution.	There is a conflict of time between the spring and autumn plantations and the spring and autumn sowing and harvesting.
Gaojiashuang	The project would improve ecological environment and conserve water and soil.	The village is not easily accessible and has a general lack of water, resulting a higher cost for afforestation.	The project could improve ecological environment. It is possible to carry water up to the mountains. The barren hills are collectively-owned and could be planted with a unified plan with professional management and collective dividend distribution.	There is a conflict of time between the spring and autumn plantations and the spring and autumn sowing and harvesting.
Gaojiagou	The village has quality water and a good ecosystem. The project would improve the	With poor transportation, village has no road leading to the mountains ; one has	To process products and develop non-timber forest products and attract villagers to return to	There is insect and disease risk and no irrigation facilities.

village	strengths	weaknesses	opportunities	risks
	environment and increase opportunities to go out for work.	to walk one kilometer to get to the fields. There are walnut trees often effected by late frosts.	the village, where there is high quality groundwater to be tapped into.	
Kudaogou (natural village)	The project could increase income and improve ecological environment. The village has plenty of barren lands and hills as well as labor, with easy accessibility to water.	It needs expenses for maintenance and management and fire prevention ; has difficulties selling fruits and is located 20 kilometers away ; there are few species of trees and lack of technology.	opportunity of downstream processing of timber products when forests are in large scale.	There is a lack of water for afforestation up in the mounains and a need for pumps ; a contradiction between forestation and grazing, and problematic management due to rabbit pest and natural disaster.
Wuhuacheng-bao	The project could increase income and improve ecological environment.	It needs expenses for maintenance and management and fire prevention ; has difficulties selling fruits and a lack of technologies and is located far away.	opportunities of downstream processing of timber products when forests are in large scale ; of developing tourism when the environment has been improved ; of harvesting non-timber forest products.	There is a lack of water for afforestation up in the mounains and a need for pumps ; a contradiction between forestation and grazing, and problematic management due to wild rabbit pest.
Bailuquan	It could improve ecological environment and conserve water and soil ; opportunity to attract investment when fruit industry comes into a large scale. The village is only 5 kilometers away from the county seat ; has plenty of water and sells Bailuquan brand bottled water.	It is difficult to sell fruits and timber products ; there is a lack of technologies for afforestation and has not formed economies of scale ; and problems of irrigation due to lack of water conservancy facilites.	It could introduce tourism industry and attract investment when non-timber forest products are large enough to form into a commodity center.	A great pressure for fire prevention as there is no men to look after forests and trees are hard to survive ; difficulty selling fruits after the harvest and management due to lack of road; follow-up investment for management ; the increasement of wild animals, which would pose a danger to the forests.
Chenjiayao	The ecological environment could become better.	poor transportation an lack of labor	The village has plenty of lands but a small population ; the forest is difficult to manage ; it is easier to plant timber trees as they are easy to manage and bring more economic benefit.	With a dry climate and low survival rate
Xiejialing	The ecological environment could	There is almost no shrubs on slopes	The village has plenty of lands but a	With strong winds and a dry climate,

village	strengths	weaknesses	opportunities	risks
	become better.	because of strong winds.	small population with most of the villagers out for work.	the survival rate is rather low.
Wangjiazhai	It could improve ecological environment and conserve water and soil, benefiting posterity ; increase economic revenue ; the barren hills and mountains are collectively-owned.	With poor transportation, it is expensive to carry water up to the mountains ; the land for plantations are located far away ; there is potential rivalry between grain growing and forest plantations.	To have economic revenue ; to formulate village regulations and villager rules ; to solve the problem of sheep eating trees	lack of water for far-away located plantation land and hard to access ; sheep eat trees
Zhangjiahe	Ecological environment could be become a little bit better.	Poor transportation and poor ecological condition	Improved economic revenues	Dry and acid climate and tree survival rate is low.