

WESTERN CHINA AGRO-ECOLOGICAL VILLAGE DEVELOPMENT PROJECT

2003-2004 ANNUAL WORKPLAN

Submitted to

**SUSTAINABLE COMMUNITIES PROGRAMME
SHELL FOUNDATION
UNITED KINGDOM**

by



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I. PROJECT DESCRIPTION

1.1 The Western China Agro-ecological Village (WCAEV) Development Project

The environmental quality of China remains in a long-term trend of deterioration as the growing population places tremendous pressure on the country's diminishing natural resources. Western China is a major priority of the central Chinese government as the region suffers from high incidence of poverty and the most seriously eroding soil and expanding desertification in the world. In the year 2000, Beijing was hit by 19 sandstorms from the western region. The serious soil degradation is a result of intensive cropping, excessive use of woody vegetation and crop residues as fuel or feed, over-grazing by animals, and cultivating crops on steep slopes. This furthers desertification and increases pressures on the land including increased clearing and usage of sensitive areas, high input farming and other unsustainable practices. Additionally, yearly rainfall is decreasing and severe droughts are frequent, meaning rural farmers have limited water available for consumption and irrigation. The demand for irrigation water coupled with the high silt output from erosion is so serious in Western China that during the past ten years the Yellow River has ceased flowing downstream of the region for extended periods of time.

There also is a growing disparity in wealth in China as peasant farmers are left behind while the nation economically progresses. Low commodity prices caused by the globalization of grain markets and the high rural population, have created intensive demands on the land to meet the livelihood requirements of small farmers, resulting in a high incidence of poverty. Rural folk, particularly men and young adults, are forced to migrate outwards from their villages to work for income, further destabilizing farm resources and the family structure. This forces women to bear the brunt of labour demands at home including household demands and farm labour. The quality of life for rural women is poor in this historically patriarchal society as their workload is heavy, decision-making and education is limited and they rarely leave their villages.

New strategies and efforts are required to create effective sustainable rural development models to respond to these problems. It is evident that a holistic and integrated approach is required to respond to the interrelated challenges of environmental degradation, inadequacies in health and nutrition and low income generating opportunities in the region. The agro-ecological village development model is currently being implemented in two locations in Western China. The project emphasizes participatory development processes with communities using a four-step plan (institutional building process, capacity building and training, farm planning, field level implementation) to increase food and energy production and create sustainable livelihoods for individuals and communities, while at the same time protecting and enhancing the natural resource base.

In China, the use of participatory methods and the agro-ecological village model present a promising new approach for sustainable development in rural communities. While participatory development approaches (such as farmer-to-farmer training) are becoming more widely embraced as nations realize their effectiveness in rural development, there has been little integration of participatory methods in China where top down extension approaches are very common. The project is strengthening efforts in China to encourage

participatory processes for sustainable community development through innovative local organizing and capacity building activities.

The Chinese government has expressed their interest and enthusiasm in scaling up this promising approach as a model for future rural development throughout China. The project is integrated into Phase 2 of the Western China Development Strategy implemented by the Chinese Federal Government and designed to reduce environmental degradation, raise farm family incomes and address socio-economic factors such as household water quality, energy resources, nutrition and education. Phase I of the WCDS is designed to reduce environmental degradation by developing environmental infrastructure such as reforestation, terraces and check dams. Phase II is designed to improve understanding of environmental and agro-ecological issues on the farm, improve farm management, improve the technical capacity of farmers, increase family incomes and address socio-economic factors such as household water quality, energy resources, gender issues, nutritional and educational concerns, and community building. The first phase of this project, a comprehensive assessment of two sites has already been completed with the joint contribution of approximately \$900,000 by the Canadian International Development Agency (CIDA) and the Chinese Government

The Chinese government realizes that while there have been major strides in the adoption of sustainable technologies, it is of paramount importance to explore new approaches to introduce these appropriate technologies to communities to accelerate rural development and ensure their long-term adoption. A key feature of the project is the interdisciplinary team comprised of Canadian and Chinese development workers, soil scientists and agronomists. The severe environmental problems in Western China make the region an ideal candidate for introduction of the agro-ecological village sustainable community development model, and this project will provide excellent exposure to support participatory community development in the world's largest developing country.

1.2 The Agro-ecological Village Sustainable Community Development Model

An agro-ecological village is described as a community that is largely self reliant through the creation of integrated and ecological food production and energy systems. Central to this approach is the conviction that ecological land management and sound community organizing forms the basis for sustainable community development. The AEV model involves building up the environmental and agricultural technical capacity of communities in a way that fosters gender equality and social development through improved information availability and an increased decision-making and problem solving skills. The successful implementation of this approach leads to economic prosperity through a diversified and more stabilized local market and improved environmental and agricultural conditions on rural farmsteads.

The general characteristics of an agro-ecological village are outlined and compared to conventional approaches in Table 1.

Table 1. An agro-ecological approach to rural development

	<i>Ecological System</i>	<i>Conventional System</i>
	<ol style="list-style-type: none"> 1) Emphasizes self reliance & empowerment through maximizing on-farm resource utilization and increasing local production. 2) Market development oriented towards import displacement and local generation/consumption 3) Minimizes human impact on local environment & biosphere 	<ol style="list-style-type: none"> 1) Emphasizes export markets to pay for imported goods 2) Approach leaves communities vulnerable to external forces through dependence on imports 3) Degrades natural resource base locally and increases greenhouse gas emissions
<i>Food Supply</i>	Local and plant based, emphasizing farm fresh production of in- season fruit, vegetables, cereals, corn, root crops, grains legumes and eggs, use of solar heated greenhouses	Much food and livestock feed imported into community
<i>Soil preparation and on-farm hauling</i>	Reduced tillage systems, power from donkeys and horses that reproduce naturally, and mules	Conventional tillage systems, power from tractors that need maintenance and replacement, and are fueled with diesel and gasoline
<i>N Fertility</i>	N fixation from forage and grain legumes, soil mineralization processes, household and animal manures	Purchased urea fertilizer
<i>Minerals</i>	Minimal erosion, recycling of household and animal manures, good soil structure	Purchase Potassium and Phosphorus fertilizer
<i>Seeds</i>	Community seed banking of open pollinated seeds, ongoing on-farm plant improvement from seed adaptability trials and on-farm plant breeding	Purchased hybrid seeds, no local adaptation trials, seeds derived from corporations, transgenic seeds being developed
<i>Weed Control</i>	Mechanical weeding devices, crop rotation, cover crops, balanced soil fertility management, use of competitive varieties and composting of manures	Herbicides and tillage
<i>Insect control</i>	Biological control strategies, resistant cultivars, balanced fertility	Insecticides
<i>Disease Control</i>	Resistant cultivators, diverse cultural management strategies	Fungicides
<i>Irrigation</i>	Modest requirement and efficient usage, provided by alternative water supply options	Gasoline/diesel powered pumps
<i>Crop drying</i>	Uses solar or biomass energy	Fossil fuel powered crop dryers
<i>Marketing</i>	Emphasizes internal self reliance first, then import displacement in local markets and value added processing	Monoculture production emphasized and sold to distant markets in the country or exported
<i>Household cooking</i>	Efficient crop residue and wood stoves, solar and biogas cookers, all biofuels derived from the farm	LPG and coal burning fuel stoves, kerosene as fire-starter, fuelwood gathered off farm or purchased
<i>Electrical power</i>	Low requirement, renewable sources explored if feasible	High requirement and from fossil fuel based mega-projects
<i>Housing</i>	Rammed earth, straw bale and straw-mud composite housing	Cement block and brick housing
<i>Livestock</i>	Sustainable feeding practices from enhanced utilization of permanent pastures with drought resistant/productive C4 grass species	Feeding from crop residues or on over-grazed and steeply sloping lands.

The adoption of this approach will improve a community's understanding of agro-ecological processes. Over time, this will:

- Increase the capacity of local communities to manage their resource base in a sustainable manner;
- Provide farming families with food security, improved health and increased income and reduce their dependence on outside assistance;
- Enable more active participation of women on farms, particularly in decision making, and increase employment opportunities;
- Reduce soil erosion and ensure the long-term capacity of the land for food production
- Improve surface and ground water quality and quantity;
- Reduce health risks to food producers and consumers;
- Help protect and restore biodiversity.

The Agro-ecological Village development model is distinctive in its ability to bridge the communication and information gap between the masses of peasant farmers and the Chinese government. Through its participatory approach and holistic design, it innovatively integrates environmental, agricultural, economic and social development through capacity building, training, education and information exchange. It also demonstrates tangible development measures including farm planning, trial farms and seed distribution. It is a simple and effective model, proven both in the Philippines and in western China, and in almost any rural agrarian community setting. Its participatory methodology allows for high levels of beneficiary ownership, creating long lasting and sustainable results in the community.

II. PROJECT PROPONENTS

The main implementing agencies are REAP-Canada and agencies within the Department of Soil and Water Conservation in China, in cooperation with local farmer organizations. The Department of Agriculture and local government units near each project site are interested in expanding agricultural production and post harvest processing industries in the areas. There are also a number of contributors and outside consultants involved in the research, implementation and development of the project.

2.1 REAP-Canada

REAP is an independent, research, education and development organization based in Ste-Anne-de-Bellevue, Quebec, Canada. REAP has 16 years experience working with farmers, scientists and the private sector to advance rural development both in Canada and abroad mainly through participatory on- farm research and farmer-to-farmer training. REAP-Canada has been working on agro-ecological village development with Philippine partners since 1997 in projects sponsored by CIDA and USAID. The organization has a leading expertise in working with communities on sustainable farming and renewable energy systems development.

2.2 International Centre for Research and Training for Seabuckthorn (ICRTS), Department of Water and Soil Conservation and (Ministry of Water Resources, P.R. China)

Following the Beijing Declaration in 1995, the ICRTS was formally established. It is the international sister organization of the China Research and Training Centre on Seabuckthorn (CRTCS), under the Chinese Ministry of Water Resources. Current members of the ICRTS include individuals from Belarus, Canada, Chile, China, Finland, Germany, India, Japan, Kirgizstan, Mongolia, Nepal, Pakistan, Russia, Sweden, Ukraine, and ICIMOD. The ICRTS aims at promoting seabuckthorn and other underutilized crops that have significant potential in the development of arid and semi-arid lowlands and fragile mountain areas, in a manner which addresses issues of global dimensions.

The Chinese team includes several specialists in dryland farming and soil and water conservation who assisted in the background assessment of the 10 sites identified for the Sino-Canada Soil Conservation Portion (Phase 1). Dr. Su Zhongren (Soil and Water Conservation Bureau) is an internationally known water conservation expert. Dr. Xu Shuangmin from the International Centre for Research and Training for Seabuckthorn and Prof. Wang Lixin, senior advisor of the Chinese National Committee to Combat Desertification, are leading experts in engineering and biological control of land degradation and dryland farming practices. These individuals will continue working with Dr. Stoskopf on Phase II of the original project. There also are local, government resource people available to provide assistance on economic development options, household energy systems and increasing farm production.

Project Contributors and Outside Consultants

Dr. Johanna Pennarz was enlisted to perform the Participatory Rural Appraisal (PRA) during the first year at the two sites with fellow experts Mr. Zong Huilai and Mr. Liu XiaoYing. Dr. Pennarz and Mr. Huilai will be enlisted to provide ongoing aid to the project through consultations on the participatory community planning, monitoring and evaluation program.

An expert team of Chinese technical consultants through the ICRTS will assist the project with an emphasis on addressing the severe environmental problems facing the communities. They will include well-known scientific experts:

- 1) Prof. Wang Lixian from Beijing Forestry University;
- 2) Mr. Su Zhongren and Mr Yu Zhuode, Senior Engineers from Yellow River Water Resources Commission;
- 3) Mr. Shi Liren, Senior Engineer from Yangzi River Water Resources Commission
- 4) Prof. Lei Tingwu, China Agricultural University
- 5) Dr. Xu Shuangmin, Senior Engineer, Chinese Seabuckthorn Development Center

III. PROJECT BENEFICIARIES

The main project beneficiaries are the people of two communities in Gansu province and Inner Mongolia. The communities are located in very sensitive landscapes particularly vulnerable to soil erosion and desertification processes. There is major soil degradation from intensive wheat and potato cropping, excessive use of trees, shrubs and crop residues as fuel, over-grazing by animals, and cultivating crops on steep slopes. Low commodity prices caused by the globalization of grain markets and the high rural population create intensive demands on the land to meet the livelihood requirements of small farmers. The region suffers from a high incidence of poverty as the selected communities have a marginal income from low production levels and many of the youth are migrating to other locations in search of improved livelihoods.

3.1 Socio-economic and agricultural history

In old China, agricultural productivity was very low, and the small-scale peasant economy was a combination of traditional farming and handicraft production. Under the feudal ownership system, most of the land belonged to a handful of landlords, while the majority of peasants had little or no land. They toiled all year round but seldom had enough to eat or wear. From 1949 to 1957 China conducted two social changes of far-reaching significance. First, land reform was carried out around 1950 and the feudal system of land ownership was abolished nationwide. Rural people (both men and women) who had had little or no land got their equal share. On this basis, the Chinese government began to transform the small-scale peasant economy along the socialist line by establishing public ownership of the basic means of production and the socialist cooperative economy. At the same time, the government organized peasants to conduct large-scale water conservation projects and improved agro-technology, giving a big boost to agricultural production. During the period of agricultural cooperation, land was owned collectively. Peasants had only some small farming tools, while larger means of production such as machines and draught animals and equipment were owned by all.

After 1957, inexperience and mishandling of economic affairs put a damper on agricultural growth, and rural development underwent a difficult period. Grain production was unduly emphasized to the exclusion of other crops; land tillers had little say in planning production; and distribution followed an egalitarian pattern. Everyone was eating from the same "big rice bowl" whether he or she worked hard or not. This situation lasted until the end of the 1970's.

At the end of 1978 China began to undertake structural agricultural reform by introducing a contract responsibility system with remuneration linked to output, meaning that while collective ownership of the land was maintained, peasant households or individuals became responsible for production in particular areas of farmland, hills, fishponds, or poultry farms, and, after selling their produce to the state according to the quota called for in their contracts, could keep the surplus for themselves. The new economic policies effectively boosted the farmers' enthusiasm for work and raised cost efficiency in agricultural production. In addition, forestry, animal husbandry, sideline occupations, and fishery developed alongside farming. The revival of open markets, reform of the system of state purchase of farm products, and deregulation of farm-product pricing have further

promoted a commodity economy and economic activities in the rural areas. At the same time, China's village and township enterprises in the fields of industry, commerce, transportation, construction, and service trades are developing rapidly. These enterprises mainly engage in processing agricultural produce, manufacturing and repairing small farm machines, making clothes, and producing components and spare parts for larger factories.

3.2 Physical Geography

The project will focus on 325 households in the Dingxi County, encompassing the 4 villages Zhangjiachuan, Fengjiacha, Chankou, and Beichuan, in the Fuxing watershed. Fuxing watershed is located in the Lanzhoong Loess Plateau Hill region, which is 80 km away from the Lanzhou, the capital of Gansu province. The watershed area is 19.32 km². Erosion has affected 100% of this region with annual erosion rate of 5400 tonne/km² (Dingxi Soil and Water Conservation Bureau). Since 1999, conversion of agricultural land to grass and trees plantation has been a major component of conservation strategies for soil erosion in this region. The government now prohibits agricultural production on any land with slope greater than 25 degrees.

The project will also encompass the Deshengxi watershed in Zhunger County, Inner Mongolia Autonomous region. This area is part of the Erdos plateau region that surrounds the Gobi desert. It will involve 230 households from the 4 villages Sujjata, Nalingo, Bainilaing and Oboyen within the watershed. At a later date, the project may also enlist support from people in the surrounding villages of Hejiago, Hanjiata, Canhanbula, Deshanxi and Sunneigou.

	Dingxi county* (Gansu province)	Zhunger County (Inner Mongolia Autonomous Region)**
# of households	325	230
Demonstration area	19.3 sq km	40 sq. km
Annual precipitation	352 mm with 60% from July-Sept.	350 mm
Annual Farm income	\$ 254/person	\$ 194/person
Basic land problems	<ol style="list-style-type: none"> 1. Annual soil erosion rate at 54 tonnes/ha from wind / water; 2. 54% of the area has slope > 25⁰; 3. 40% of this region severely eroded. 4. New restrictions on grazing 5. Lack of water 	<ol style="list-style-type: none"> 1. Loss of vegetation cover from over-grazing 2. Severe wind / water erosion 3. Water shortages 4. New restrictions on animal grazing 5. Limited water, 6. Inferior soil quality

Structure of watersheds	One major watershed with evenly dispersed settlements in it. Community consist of several hamlets	One major watershed with settlements on higher locations. Dispersed farms and settlements
Natural resources available	Limited grassland, low biodiversity	Plenty of grassland, higher biodiversity
Farming systems	Limited agricultural crops, one crop cycle, few livestock	More agricultural crops, several crop cycles, more livestock
Government projects and policies	Major soil conservation program under implementation; “turning land into forests” program under implementation in parts of the community	“Turning land into forests” program under implementation; sea buckhorn project under implementation
Processes of migration	Temporary migration common in project area	Permanent out-migration fostered by the government
Source:*2001 survey from “Demonstration plot for comprehensive rehabilitation of wind erosion and desertification environment in Pingchuab Township of Linze county, Gansu province. 2001” ”Basic condition and general planning consideration” Linze County: Cold and arid regions environmental and engineering research institute, Chinese Academy of Science; ** Department of Soil and Water Conservation, P.R. China.		

3.3 Agricultural conditions and practices

At the Dingxi site, many farmers are deriving much of their farm income from field crop production. A recent survey of 30 farmers in the community found 88% of their agricultural income was from crop production, with 34% from potato production and 54% from other crops. Many farmers also have a small livestock component including sheep, goats, pigs and poultry. In China, Dingxi County is known as the potato capital, as the crop is well adapted and high quality potatoes are produced in the region. Many farmers now believe potato production will bring them more profit than spring wheat, the dominant field crop in the area previously, and production is increasing. A recent survey of the households found that on average each household farmed 30 mu, and had 11 mu in potatoes, 11.7 mu in other field crops (wheat, peas, lentils, flax and corn), 6.4 mu in grassland (mainly alfalfa) and .9 ha were in fruit and vegetables. Caragena and Sea Buckthorn are also being planted in vulnerable areas to reduce soil erosion. From the PRA report it was determined that the maximum size of farmland owned by household is 25 *mu* and minimum size is only 7 *mu* (including land for land conversion program). The average per capita farmland is 4.8 *mu* and 625 kg grain per capita. The main crops are wheat, potato, peas, lentils, millet, and buckwheat. Farmers have to sell grain to the state according to their contractual quotas contracts; for most households, the remaining grain is sufficient self-consumption. Still, there are many households who do not produce sufficient grain for self-consumption and have to buy grain for household consumption from the market. The common crop-cycle is: beans-wheat-potatoes. Potatoes are the most important cash crops in the project area.

Most farmers use animal manure and human waste as the main form of fertilizer for their crop production and supplement with commercial fertilizers. Farmers apply organic

manure only on those plots located in convenient distance to their house. Few are using pesticides for field crop production. Farmers in the watershed usually practice fall plowing in the region and do their tillage with mules. Livestock (including pigs, sheep, goats, donkeys, mules and poultry) are generally fed crop residues, alfalfa, wheat bran and cull potatoes. Farmers have indicated that they never leave any crop residues after harvest because of lack of animal feed and the need to burn residues for household cooking and heating. Recently, the government has placed a restriction on grazing livestock on sloped grassland as a means to mitigate soil erosion. As a result, many farmers have started to practice in stock feeding of sheep and have reduced the numbers of sheep and goats in their livestock herds.

The major risks affecting agricultural production are lack of rainfall and soil erosion. At the Zhunger County site, much of the communities income has historically come from livestock rearing, particularly goats for the cashmere industry. The many years of excessive grazing from sheep and goats on the highly erodable soil has created severe gully erosion over much of the area. Much of the project site had rates of erosion of 200 tonnes/ha prior to the initiation of work by the Soil and Water Conservation Bureau. Sea buckthorn and caragana have been heavily utilized with great success to greatly alleviate soil erosion in gully areas. The community is familiar with the production and translocation of sea buckthorn through farmer-to-farmer trainings initiated by the International Center for Research and Training for Sea Buckthorn. The main field crops grown in the flatter upland areas and in valleys are potato, sunflower, corn, millet, and alfalfa. Minor crops include buckwheat and mustard. The vegetables grown in the project area include Chinese cabbages, bush and pole beans, green soybeans, coriander, peppers, tomatoes, zucchini, sweet corn, water melon, and cucumber.

IV. PROJECT OBJECTIVES, PURPOSE, OUTPUTS and INDICATORS

4.1 Overall Project Objective

The overall objective of the project is to mitigate poverty and increase the self-reliance of marginalized Chinese farmers living in environmentally sensitive areas, while reclaiming degraded environments.

The long-term impact this project intends to make is the widespread adoption of sustainable agriculture techniques at the community level. The implementation of practices aimed at better understanding agro-ecological processes that restore the landscape ecology, require minimal use of fossil fuel based energy inputs, and encourage diversified and integrated production systems, which will bring economic gains to communities. It will also improve self-sufficiency, increase production, improve marketing opportunities, increase employment and income, and improve health from a fresh and more varied diet. The project aims to improve the lives and roles of women in communities through a participatory development approach that emphasizes gender issues. The project envisions the successful implementation of a sustainable community development model that can be replicated to other areas of China and Asia. The Agro-ecological Village Model has been selected because it is easily locally adapted and is

based on the transfer of sustainable agriculture techniques to whole communities. As the benefits of sustainable community development are realized, the people will have greater household self-reliance through increased income and opportunities.

Indicators

- 1) Increased income and employment
- 2) Improved environmental conditions.

Sources of verification

REAP-Canada will work in partnership with the Sea Buckthorn Centre/Bureau of Soil and Water Conservation, and lower government units (Dingxi district and Inner Mongolia Autonomous Region) and farmer's associations to collect the necessary data on community finances, employment and soil erosion rates.

4.2 Project Purpose

The project aims to improve the economic and social well being of marginalized farming communities with a focus on women, while at the same time protecting and enhancing the natural resource base through the use of participatory development methods and the agro-ecological village development model.

The project envisions empowered and gender sensitive agrarian communities meeting their subsistence and other needs in a sustainable manner. As a result of using resources provided by the project, the primary beneficiaries will experience an improvement in economic, social and environmental conditions:

- 1) The project aims to actively rehabilitate the natural resource base of the region and minimize greenhouse gas emissions through the adoption of ecological farming practices. One main objective is to reduce soil erosion and increase the long-term viability of the land, to promote farm diversification to provide a more constant flow of income, to improve food security and family health through self-reliance in food production, to reduce vulnerability to dry weather conditions and to reduce external agricultural inputs including fossil fuels, synthetic pesticides and fertilizers.
- 2) The project will cultivate and expand the capacity of the communities to generate leadership through a farmer-driven development process, which is essential to the long-term, sustainable results. Participation will be increased by the farmer-to-farmer training process, fostering the entrepreneurial spirit and capacity of men and women in the community. Communities will be empowered to work in partnership with local government units to identify their comparative advantage for economic development. Identifying and developing local, regional and national markets will enable them to develop and enhance their production capacity. Training in ecological production methods will allow farmers to generate income while expanding the productive capacity of the land.
- 3) The project also aims to increase awareness and responsiveness of Canadians to the challenge of creating sustainable development in southern countries.

Indicators

- 1) Adoption of ecological farming measures (including contouring, organic and diversified production).
- 2) Increased supply and diversity of farm products for local and regional consumption.
- 3) Increased income and quality of life for villagers, particularly women (including family income level, capital generating activities, household expenditures, health status, children school attendance rate, credit sources and women's activities as indicated by the socio-economic survey)
- 4) Improved environmental conditions.

Sources of verification

REAP-Canada will work in partnership with the Sea Buckthorn Centre/Bureau of Soil and Water Conservation, lower government units (Dingxi district and Inner Mongolia Autonomous Region) and farmer's associations to collect the necessary data. Baseline information will be obtained at project outset, and will be monitored throughout the project to ensure the proposed activities are accomplished. Data will also be collected at the end of project implementation to evaluate proposed indicators, project outputs, accomplishments and provide future recommendations.

- 1) 30 household surveys collected per community annually in the spring
- 2) The Department of Soil and Water Conservation will be responsible for annually collecting data on soil erosion, area under reforestation and area terraced.

4.3 Project Outputs

The project intends to deliver a number of services and facilities to the communities:

- 1) Increased capacity of farmers through establishment of training network
- 2) Increased economic activity
- 3) Improved status of women
- 4) Landscape restoration through contour farming, re-vegetation of sloping lands and controlled grazing

Indicators

- 1) 900 trainees trained by March, 2005.
- 2) 300 farm plans developed by March, 2005.
- 3) Household income increased by 20% by March, 2005.
- 4) Participation of women in community activities at 20% by March, 2005.
- 5) Improved quality of life (housing, education, health) in rural communities by March 2005.
- 6) Improved environmental conditions and a 33% reduction in areas vulnerable to soil loss by March 2005.

Sources of verification

REAP-Canada will work in partnership with the Sea Buckthorn Centre/Bureau of Soil and Water Conservation, lower government units (Dingxi district and Inner Mongolia Autonomous Region) and farmer's associations to collect the necessary data.

- 1) Details of training sessions and the farmer meetings (8-10 per year), including attendance and activities.
- 2) Detailed household survey (collected once a year, 30 per community).
- 3) Data collected by the Bureau of Soil and Water Resources once a year.

4.4 Four-Step Plan

Project activities have been broken down according to a four-step plan that will lead communities through the development process.

Institutional building process

This will involve communities strengthening their local infrastructure by building the capacity of Farmer's Organizations and improving their interaction with local governmental units. Other approaches, such as the use of surveys and the administration of a Participatory Rural Appraisal (PRA) also are used to strengthen community ties and encourage solving of common problems together.

Capacity building and training

Communities will improve their information transfer network through the development of farmer-to-farmer trainings in the communities. The local farmers will work with project staff to develop training modules and prepare training programs. They will also select local people to become farmer trainers and ready them to perform the trainings. Incorporated into the capacity building aspect of the project, but included in all other areas of the project is the promotion of gender equality through equal access for both genders to project benefits. This is evidenced in the training component of the project through the selection of women as farmer trainers and participants in all community meetings and farmer training sessions.

Farm planning

Through trainings and on the job coaching, farm planning will provide farmers with the skills to improve their farm management and incorporate sustainable farming techniques into their daily activities. A focus has been put on sustainable soil fertility management and optimizing livestock production in response to new grazing policies. Farmers will also be encouraged to “weatherproof” their farms to enable them to withstand extreme weather events such as drought, sandstorms and floods.

Field level implementation

This component of the project involves the physical improvement of the local environment through such techniques as soil contouring, check-dam construction and slope revegetation. This aspect is also intended to improve the agro-ecology of local farms through the establishment of on-farm research trials and learning farms.

V. PROJECT ACTIVITIES

Table 3: Summary of Project Activities and Associated Indicators	
<i>Project Activities</i>	<i>Measurable Indicators for Activities</i>

<p>1. Baseline data gathering and surveys</p> <p>1.1 Collection and processing of required baseline data, initial site analysis (agroecological assessment of farming systems)</p> <p>1.2 Socio-economic survey: detailed analysis of 30 to 40 households per site</p>	<p>1.1 Baseline data collected and ecological community analysis results.</p> <p>1.2 Collected data and analyzed results from the socio-economic survey.</p>
<p>2. Institutional Building Process</p> <p>2.1 Perform participatory rural appraisal</p> <p>2.2 Strengthening the capacity of Farmer's Organizations</p>	<p>2.1 Completed PRA exercise, record of discussions, needs/objectives analysis, and action plan.</p> <p>2.2 Number of participants involved in community organizations, meetings and activities.</p>
<p>3. Capacity building</p> <p>3.1 Develop training modules</p> <p>3.2. Perform farmer-to-farmer trainings</p> <p>3.3 Develop individual farm plans to implement ecological practices learned in trainings</p> <p>3.4. Develop project gender strategy.</p>	<p>3.1 Completion of ecological farming training modules.</p> <p>3.2 Number of individual farmers attending the trainings, the trainers prepared to give trainings and the number of trainings including field activities (male vs. female).</p> <p>3.3 Number of individual agro-ecological farm plans developed and farmers participating in trainings.</p> <p>3.4 Number of women participating in community projects and activities</p>
<p>4. Field Level implementation</p> <p>4.1 Soil contouring</p> <p>4.2 Revegetation</p> <p>4.3 On farm trials and research</p>	<p>4.1 Amount of agricultural, degraded or environmentally sensitive land improved by soil contouring.</p> <p>4.2 Amount of re-vegetated agricultural, degraded or environmentally sensitive land.</p> <p>4.3 Number of trial farm areas, and the amount of germplasm tested.</p>
<p>5.0 Communications and public engagement</p> <p>5.1 Disseminate information to the public through conferences, publications, websites and presentations to interested parties</p> <p>5.2 Video documentary production and distribution</p>	<p>5.1 Development of the AEV development primer. Number of conferences and people reached through the public engagement process.</p> <p>5.2 Video documentary production</p>

5.1. Baseline data gathering and surveys

5.1.1 Collection and processing of required baseline data, initial site analysis (agro-ecological assessment of farming systems)

Baseline information on the selected communities was obtained before the project was initiated, and will be monitored throughout the project to ensure the proposed activities are accomplished. Data will also be collected at the end of project implementation to evaluate proposed indicators, project outputs, accomplishments and provide future recommendations.

An Agro-ecological survey was performed of the local farming practices in communities to evaluate their ecological impacts. The results of this assessment were analyzed and formally reported, and incorporated into the development of the community. The Agro-

ecological data will continue to be surveyed. The most relevant Agro-ecological indicators have been incorporated into the socio-economic survey to be monitored annually. These include:

- Land use
- Crop, vegetable, fruit, livestock production
- Seed sourcing
- Composting, bio-residue utilization
- Farm records and planning

Indicator

The baseline data collected and ecological community analysis results from the agro-ecological assessment of farming systems will be indicative of the successful implementation of this activity.

5.1.2 Socio-economic survey

Careful monitoring of performance indicators is essential to the success of the project as part of the agro-ecological village development programming methodology. A detailed socio-economic survey will be performed each year of the project on 30-40 households within each region. The survey will address the indicators identified in the original project concept and quantify them in a numerical or “grade” fashion so that differences in communities can be compared to determine project impacts over time, and after the project has been completed. Relevant Socio-economic indicators have been included in the survey and will be monitored annually. These include:

- Demographic characteristics
- Family Employment, Income and Expenditure
- Education
- Living Conditions
- Food and Nutrition, Food security
- Household responsibilities
- Priorities for future development

The socio-economic survey has been combined with the Agro-ecological survey to provide a comprehensive annual view of the local situation in each community. Information contributed from these households will indicate the degree of project success while at the same time providing feedback through which programming can be improved. The collection of the socio-economic/agro-ecological survey data will continue and be further analysed systematically each year. Indicators involving the “food footprint” of each household and a detailed energy analysis may also be included in years to come. Efforts will also be made to develop a participatory monitoring and evaluation program involving the socio-economic survey, and its administration by local community members.

Indicator

The collected data and analyzed results from the socio-economic survey will be indicative of the successful implementation of this activity.

5.2. Institutional Building Process

5.2.1 Perform Participatory Rural Appraisal (PRA)

The project implementing agencies are working to ensure a high degree of ownership by the project beneficiaries through the use of a community based, participatory development approach. Communities have already identified their constraints, opportunities and needs through a Participatory Rural Appraisal (PRA) process. PRA's for each community were completed in 2002 and will not be performed again for year 2 or 3 of the project.

The participatory rural appraisal (PRA) approach was utilized to emphasize local knowledge and enable local people to make their own appraisal, analysis, and plans. It also increases the capacity of the local organizations to perform their own ongoing appraisals in a flexible and dynamic manner. A record of discussions, and community needs/objectives was kept and analysis and the development of recommendations for an action plan was prepared in a formal report. The PRA involved a team of people working for approximately one week at each site completing workshop discussions, analyses, and fieldwork. The PRA team included three qualified development experts, Ms. Johanna Pennarz, Mr. Zong Huilai and Mr. Liu Xiaoying, working in conjunction with local partners and government officials working on the project. PRA techniques will continue to be used by project staff to collect data from project beneficiaries and encourage group discussions on project and community issues. The PRA process also established community approval of the indicators used to gauge the success of the project, and facilitated the creation of an ongoing Participatory Monitoring and Evaluation (PM&E) program to be maintained by the community members. This will be continuously used to validate the action plan, assess the direction of the project, make management adjustments, elucidate procedures and ensure the ongoing capacity building of the community.

Indicator

The completed PRA exercise and analysis of data, along with a discussion record, a needs/objectives analysis, and action plan, will be indicative of the successful implementation of this activity.

5.2.2 Strengthening the capacity of Farmer's Organizations

Capacity building should be understood as an ongoing process in this project and a cross-cutting issue in all components. The main aspects of the capacity building process are:

- Increasing farmers' capacity to analyse their local environment and apply ecological principles to their farming methods.
- Institutionalise approaches of mutual learning, support and information exchange within the community (local)
- Institutionalise approaches to network information and experiences outside the community (regional and national)

Community Groups

One strategy of the agro-ecological village development model is to empower and more effectively use peasant and community groups in rural development, which is increasingly possible in China. Rural areas are experiencing changes in local dynamics because of reforms enabling the participation of peasant farmers in local governance, through the establishment of locally elected positions in villages. These locally elected farmer leaders link the project into local governance structures to encourage rural development. Farmer groups play a key role in implementing the project and take some level of responsibility in managing the farmer trainers. These groups help create a social infrastructure that ground activities into farming communities. The groups link farmers in different communities in obtaining information on farming techniques and the latest agricultural trends, sharing equipment or post-harvest facilities and provide support and learning. They also facilitate cooperation with local government units, and support marketing efforts through the creation of farmer co-operatives. Community organizers are developing the ability of local institutions to take a more active role in the community's development process. Four community organizers are now working in both Dingxi and Zhunger. A printing handbook and workshop on project management were given to local organizers. These people are actively involved in the existing trainer's training, farmers' training and community infrastructure locally. Encouraging the efforts of farmers to work together to address local problems is critical to encouraging effective and low cost rural development.

Project Community Groups

There are currently farmers organizations established in the communities selected for the project called village "groups." Group officials are elected every two years and include a secretary from the local Chinese government, an accountant appointed by two elected officials and a farmer director. Each group includes 30-40 farmers and their families.

In Dingxi the project includes 325 farming households, and 12 farmer groups from the 4 villages (Zhangjiachuan, Fengjiacha, Chankou and Beichuan) within the Fuxing watershed. At the Zhunger site, a total of 230 households are found in four villages (Sujiata, Nalingo, Bainilaing and Oboyen) within the Deshengxi watershed area. The Zhunger community appears to be less formally organized than that of Dingxi. However, it has had initial orientation and experience with farmer-to-farmer training methods, through the BSWC and a project producing sea buckthorn seedlings. Seedlings grown in the community are now being transplanted into environmentally sensitive areas in Zhunger county.

Farmer Technical Groups

One aspect of the agro-ecological village model for sustainable community development would see the eventual establishment of farmer technical groups specialized in certain agricultural techniques or approaches as part of the PTT (see below). The members of this group would participate on their own interest and of their own accord. These technical groups would provide an effective, participatory and consensus-based method

in dealing with environmental issues including water conservation, soil erosion, plant improvement, soil fertility, and environmental remediation and revegetation. They may also include socio-economic issues such as marketing policies or economic strategies. These groups would select relevant topics and members would be local farmers who are interested in the subjects. Women's groups related to gender specific activities (such as gardening) would be encouraged. The activities of the groups will include brainstorming, elaborating discussions, field-testing, researching new information or techniques and fostering teamwork and cooperation within and between the various farmers group and local partners. These groups are designed to enhance the confidence of local people relating to their own creative thinking ability and capacity for local knowledge generation.

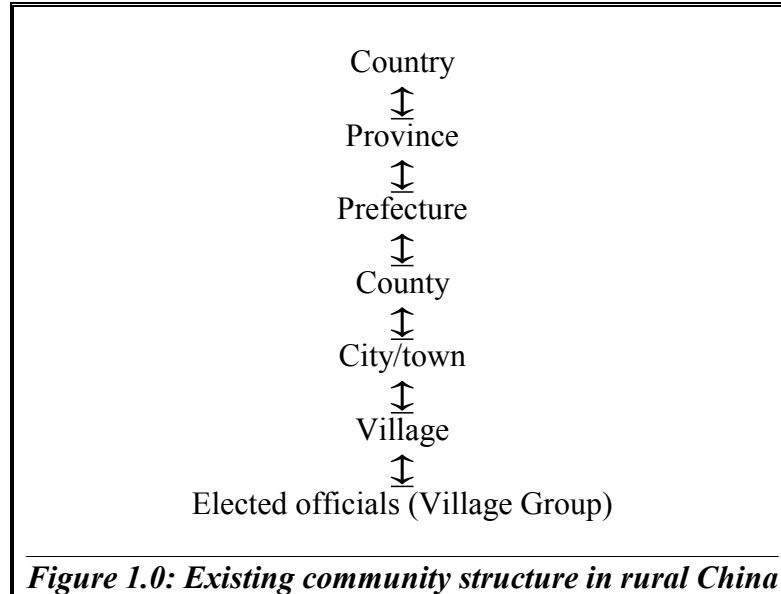
Kitchen Table Discussions

Once the development of the project is underway, the farmers will be encouraged to have a series of informal "kitchen table" discussions once a week during the slow season (February to April); the participants would do so of their own interest and accord. These discussions would mirror the approach of the Ecological Farmers Association of Ontario (EFAO), an organization of Canadian farmers. The discussions would be prepared by the local farmers, and geared towards a cross learning of ideas and a tangible or practical output. They would focus on subjects requested by the farmers and could include topics such as alternative energy (animals, plants) or medicinal/holistic treatment by farm products. Discussion groups involving women's issues would also be actively encouraged.

Local Linkages

The project aims to create stronger linkages between the local partners implementing the project, the government officials and the beneficiaries or local communities. During year one of project implementation, it was noted that Zhunger is facing a much more difficult situation in terms of local community organization as a result of the widely dispersed households and lack of current community organization or contact. During year two, relationships will continue to be fostered with the farmers by the Zhunger Chinese Project Co-officers. Community activities will continue to integrate local farmers with each other and with government officials and improve information transfer networks and communal decision-making and problem solving. Additionally, There are some underlying tensions between community members and local government officials due to the recent introduction of the restricted grazing policies and the conversion of large areas of farmland into conservation areas, particularly in Zhunger. These issues have been recognized by all project staff and new efforts and strategies to improve relations and strengthen community ties are being continually developed.

The communities themselves have utilized their existing organizational structure to determine the membership of the basic beneficiary group and the group management structure that will guide the ecological farming development of the community. The existing organizational structure of Chinese communities can be seen in Figure 1.0



Indicator

The number of participants involved in community organizations, meetings and activities will be indicative of the successful implementation of this activity.

5.3 Capacity Building and Training

5.3.1 Develop training modules

A variety of participatory learning approaches will be used to develop a comprehensive training program for the pilot communities. The program will include formal training manuals dealing with sustainable farming techniques and farm development, but will also involve applications and mentorship including cross-site visits, on the job coaching during the growing season and kitchen table roundtables in the winter. For each training topic, an interactive training module will be developed. The modules describe all of the important concepts that should be conveyed to the farmers, and will act as a guide for the trainers to be delivered in conjunction with the on-farm test trials.

The first 7 training modules were completed in Canada and adapted for local use in China during year one of the project. They were translated from English into Mandarin and include:

1. Introduction- Principles of ecology and sustainable agriculture
 - Ecological Principles
 - Agriculture in China
 - Ecological Farming
2. Soil Fertility and Organic Components of Soils
 - Introduction to Soil Fertility
 - Soil Properties
 - Physical
 - Chemical
 - Biological
 - Organic components of soils
 - Organic Matter
 - Composting
 - Manure management
3. Cropping Systems
 - Basic Principles
 - Benefits of cropping systems
 - Examples of Crop Rotations
4. Green manures and cover crops
5. Weed Management Control
6. Disease and Pest Control
7. Soil and Water Conservation

These modules will continue to be updated and modified throughout the project according to the needs and developments of the farmers. Additionally, the following modules will be completed and delivered to farmers during the upcoming year:

8. Livestock Husbandry
9. Holistic Farm Planning and Design (detailed)

Initially identified as areas of interest by project staff and communities, the PIT will also look at developing the following modules during year 2 and 3 of the project:

- Food security
- Vegetable production
- Food production, processing, storage and marketing

Indicator

The completion of each ecological farming training module in the form of a simplified translated version

5.3.2. Perform farmer-to-farmer trainings

The farmer-to-farmer training process allows local farmers to take the lead in community capacity building. The investment in empowering and training farmers generates a high capacity to continue the development process. Additionally, the investment in strengthening the farmers' institutions, and developing bottom-up training programs to complement the traditional top-down infrastructure are key features that will help continue the development process in communities beyond the project's lifespan.

5.3.2.1. Development of trainers

The project utilizes 'farmer-to-farmer' training, a well proven peer education training system utilized by farmer alliances in Canada and the Philippines. With millions of rural peasants in China, it is evident that conventional training approaches using exiting government extension positions will not adequately meet the enormous training needs of farmers in the nation. Farmer-to-farmer training is a core component of the WCAEV project. It is an approach that can help enable large numbers of farmers to have access to training using this effective and low cost learning method.

Fundamental to this approach is to develop experienced farmer trainers, known as "first liners" to lead training sessions. These individuals will be progressive farmers having a sound understanding and skills in farming, understanding of social and ecological issues and effective organizational and facilitation skills. *Please refer to Table 5 for Guidelines for the effective facilitation farmer-to-farmer training sessions.* Other farmers still undergoing the process of becoming an experienced farmer trainer, will be trained as "second-liners" to re-echo these lessons in their local areas to disseminate the information. During the session, these second liners will play a support role, learn through actual experience and gain confidence in the training process. Young farmers who have high potential for development will also be encouraged to become trainers during the project, and will be exposed to various subjects and trainers. The farmer trainers will be developed with participatory methods, so as to actively engage all members of the community including the women and the shy farmers. Trainer's training sessions will be provided to upgrade trainers on a periodic basis. Through this participatory peer education approach, trainers are continuously being developed, and groups are kept small as farmers are exposed to a diversity of farmer trainers and issues. This training approach can be adopted for instructing individuals how to employ organic farming, diversify their production, develop their farm in a holistic manner, and every other aspect of the agro-ecological village development.

Table 4: Guidelines for the effective facilitation of farmer-to-farmer training sessions	
<i>Important facilitating skills:</i>	<i>Barriers to effective communication</i>
<ul style="list-style-type: none"> • Organize the topics • be prepared for the topic • organize the visual aids • have a good grasp of the ideas to quickly answer questions • know how to facilitate the flow of discussions • know how to get the attention of the listeners • know how to make use of gestures to emphasize his point 	<ul style="list-style-type: none"> • Message is not clear • Seminar/meeting is not well-organized • Language/ technical terms not understood • Divided attention on the part of listeners (personal problems may get in the way ie: participants are hungry) • Audience is uninterested in the topic

<ul style="list-style-type: none"> • have self-confidence and be comfortable speaking in a group • give the audience undivided attention through frequent eye contact • know how to control unnecessary mannerisms/bosy language • avoid unnecessary repetition of words/avoid redundancy • Incorporate distractions into the context of the training • Know how to manage time • be creative • have a sense of humor • be emphatic • be committed and focused • be open-minded to comments/criticisms • have a clear and audible voice • have legible penmanship • be sensitive to the needs of the participants • know how to gauge the level of listeners 	<ul style="list-style-type: none"> • The speaker is unable to get the attention of the listeners • Excessive noise • Distractions
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It is essential that women are enlisted as trainers in the farmer-to-farmer training program. The purpose of this is threefold, first to build the capacity of these individual women as trainers, secondly to have women engaged as active participants in the project and ultimate in the community, and finally because it is from women that other women will learn best. This is one of the most challenging aspects of the programming as the women in these communities may be poorly educated and painfully shy. However, we must recognize that the involvement of women in every aspect of the project is fundamental to the improvement of the quality of life for the farmers, for the cohesion of the villages, and for overall success.

During year one in each of the pilot communities, 35 farmers in Dingxi and Zhunger were selected to undergo training as farmer trainers. 8 farmers (including 3 women) in Dingxi and 10 farmers (including one woman) in Zhunger were then selected by the PIT to be the core project staff to deliver the trainings. The remaining farmers are to continue to develop as "second liners". The four main farmer trainers will work at a part time level so as to encourage them to maintain their farming livelihoods and enable them to further develop their own farms as "model" farms. The activity of the farmer trainers will be supported through the close cooperation of the local community organizers.

During year one, the 'first liner' farmer trainers were initially trained and will be delivering the first set of trainings on the introduction to ecological farming to local villagers in the upcoming months. Trainers in both Dingxi and Zhunger will continually undergo training and capacity building as required to prepare for the delivery of the training program to the rest of the village and community members. They will also further develop the training program and manuals to improve the complexity of the technical information as well as to improve the suitability for local farmers. The initial mentoring of the trainers was provided by project staff and participatory training expert Mr. Zong Young. In year two, this mentoring will continue to be provided by project staff but will include contributions from experienced farmer trainers from outside agencies and local professionals trained in participatory methodologies. Experts from the field of ecological farming and soil and water conservation will continue to mentor the farmers so that they can provide the more advanced trainings in the future. Staff of the Bureau of Soil and Water Conservation and

appropriate agencies will continue to develop training of new subjects of interest to the farmers and can act as a resource people on subjects which they have a significant depth of knowledge.

In year two, the project also will hold “trainers trainings”. These are training sessions that teach farmers how to become effective farmer trainers. The sessions will be coordinated by project staff and facilitated by experts in participatory methodologies who are experienced in sustainable farming and experienced in working with women and encouraging them to become farmer trainers.

In year two, the farmer trainers will also become more comfortable in conducting “farm visits” and assessing farming systems on site and becoming “on the job coaches”. Farmers will spend time doing cross visits on each others farms and managing and discussing the adaptability trials and learning farms.

5.3.2.2. Training Programs

A “ladderized” training program is utilized in the agro-ecological village approach. Ladderized trainings are a series of training sessions presented in an order that gradually increase the technical level of information available to the farmer. Initially, a sensitization of the communities was important to deepen the level of understanding of the social and economic situation the farmers are facing, both locally and nationally. It also provides a historical and ecological analysis of their situation, and examines key events that brought about their current situation. The problem-solving component of the exercise is designed to energize the farmers and encourage them into action in their communities. This is followed up by technical trainings on ecological farming, and includes modules on farm planning, diversified farming, input reductions, plant improvement, and advanced ecological farming techniques. Trainings also include “field trips” to model farms employing sustainable agriculture or in the process of conversion, and mentoring through farm visits and individualized on-the-job (OJC) coaching by trainers.

Each community will continue to undergo custom training needs analysis to determine which training sessions are most relevant to the farmers. Ongoing monitoring of the applicability of the training programs will be evaluated through expectations and feedback from participants at the outset of the seminar, and trainers arriving prior to the trainings to assess the situation locally and discuss the program amongst themselves. Performance measurement will gauge the effectiveness of farmer trainings to measure the long-term application of knowledge acquired in farmer trainings. Evaluations will be routinely conducted through communication of the training coordinator with farmer trainers, who will be responsible for maintaining contact with trainees after the trainings.

Training Format

The training schedule will be set up by the local staff, who will determine the most appropriate timeline based on the stage of development the local farmers are at. The trainings should not be conducted with more than two topics at a time, and should be done in a participatory manner involving both whole group discussion and small group

activities with both lecturing by the trainers and speaking/analyzing done by the farmers themselves. A special effort during the trainings should be made to involve the women in activities and discussions (it may be beneficial to break them into small groups of women only at the beginning if they are uncomfortable or quiet) to ensure they are actively participating. A 2 hour “situationer” can be held on the first morning of each session to discuss the social, economic, and environmental current events affecting the farmers. This process furthers the sensitization of the farmers and encourages them to actively evaluate their local and national conditions. At the end of the training session, it will be reviewed whether the expectations have been met, and a record of both the positive and negative feedback made to further improve the training process.

A typical training lasts for 2 days, but can be anywhere from 1-3, they should be held all year round with the majority concentrated in the winter months when farmers are less busy. The training sessions should have from 15 to a maximum of 25 participants. The training is free for participants and healthy, well-balanced meals are provided during the session with counterpart by the farmers groups where possible. The farmers will generally not be reimbursed for the trainings to ensure the sustainability of the community groups after completion, as well as to ensure the farmers see the free education as a benefit and attend for interests sake. The location of the trainings is also important for an effective training. The trainings should be held in an area close to the locations of the farmers so that they will not have to travel far, in a building with adequate facilities (chalkboard etc.), light and fresh air. Trainings may also be held outdoors or “off-site” during the warm season where participants are less susceptible to distractions to enable more focused and extended discussions. There is also more opportunity for discussion than in a formal setting, and shy people are encouraged to ask more questions. Farmers are generally more comfortable in rural settings, and the off-site trainings can provide the opportunity for visits to nearby farms. The trainings will be primarily during the winter season and at other less busy times during the year.

Indicator

The number of individual farmers attending the trainings will be indicative of the successful implementation of this activity. The number of trainers prepared to give trainings will also be recorded, as will the number of trainings including field activities (site visits to model farms, on the job coaching and kitchen table discussions). The data collected will also reflect the number of males and females involved in the training program.

5.3.3 Develop individual farm plans to implement ecological practices learned in trainings

Basic farm planning sessions have been completed and will continue into the next season. More advanced sessions are also planned for the upcoming year. When the communities have undergone sufficient organization and training, they will engage in an extensive and detailed farm planning process. The farmers must first have a firm understanding of ecological processes and objectives before being able to plan their farm in a sustainable and successful manner. The farm planning process should follow a similar approach to the

PRA-workshop starting with the analysis of problem areas on individual farms and identifying areas for improvement, finally determining concrete actions. Individual plans will be developed and revised as necessary to implement agro-ecological measures and renewable energy systems for their farms and households and to identify livelihood opportunities to increase household income and employment opportunities. The local farmers will support each other in planning their individual farms. Local project officers, farmer trainers and community organizers will provide support to farming families to create detailed action plans for their farms. Technical experts will be available to discuss technical details, but largely it is the individual farmers planning their own farms with trainers facilitating their planning through discussions (both group and individually). It is also important to remember during the activities that women should be encouraged to actively plan their farms together with their husbands.

To develop their farm plans, farmers will utilize seasonal calendars, transect maps, workplans, cropping systems and rotation information, green manures, 5 and 10 year land use goals, predicted expenditures and other planning techniques. Farmers will discuss strategies to conserve water and soil and minimize the use of fossil fuels and synthetic pesticides and fertilizers. Individual farm transformations may include the implementation of a more comprehensive crop rotation, and soil fertility management plan, increased farm mechanization and the introduction of new crop and livestock enterprises that could be introduced over a 5-year period.

The ecological farm-planning guide will be used as the main tool for guiding the communities through their farm planning process. The existing ‘Introduction to farm planning’ training module will be modified on an ongoing basis to improve suitability for farmers and the local agronomic situation. These ongoing modifications to the farm-planning module will be made by the farmer trainers themselves. The training and on the job coaching of the farmer trainers to complete this activity with communities will be made by local technicians working in partnership with the local project office of the Bureau of Soil and Water Conservation.

Farmers will be advised to concentrate most of their planning efforts on the first year of transformation, although less detailed planning of longer term farm transformations will be encouraged. They will assess their own need for appropriate technologies such as bio-gas and solar cooking and heating systems, as well as farm implements like hand-held tools, micro-irrigation and draft animals. The farm planning process will provide the basis for farm transformation and plans will be revised as necessary through the conversion process. Monitoring and analysis by the training team will be performed, along with individual on the job coaching for implementation.

Food Footprint

In year two, the farm-planning training component of the WCAEV project plans to utilize a management strategy called the Ecological Food Footprint Analysis. The Food Footprint Analysis is a simple and effective tool that provides a relevant and clear representation of household food consumption. It is a simplified adaptation of the

Ecological Footprint Analysis developed by Wackernagel and Reese and introduced in *Our Ecological Footprint: Reducing Human Impact On the Earth*. The Food Footprint quantifies the amount of land required to grow the main agricultural components of household food requirements. Land production rations (e.g. tonnes/ha) are defined for each crop and multiplied by annual consumption amounts (kg) to give the land requirements for each food component. The Food Footprint for each crop is then summed to give the total land area that is required to feed a household or an individual *sustainably*, meaning that the same plot of land must be available for production the following year for the same crop.

The Food Footprint is therefore extremely effective when assessing household food security. In order to secure basic dietary requirements, households must first assess existing land usage, looking at the planted area and the associated agriculture returns. The Food Footprint is also applied as a planning tool, encouraging farmers to reduce household Food Footprints while more efficiently managing farm land to produce higher and sustainable yields. When food energy content is also considered, Food Footprints can be transformed into energy efficiencies, encouraging farmers to seek out methods of increasing energy returns while reducing their household Food Footprints.

Indicator

The number of individual agro-ecological farm plans developed will be indicative of the successful implementation of this activity. The number of farmers participating in the farm planning trainings will also be recorded.

The project will identify and develop markets to increase household income and employment opportunities, and for promising farm products locally and regionally. As the communities development proceeds and primary production problems are resolved greater efforts will be made at brainstorming and investigating market opportunities for products both locally and regionally. For example, potatoes, medicinal herbs and greenhouse production of flowers and vegetables have been identified as promising enterprises for increasing farm income in Dingxi County. These activities will be explored in more detail for year three.

5.3.4 Project gender strategy

5.3.4.1. Rationale

The proponents of this project aim to highlight the significant role a woman can play in confronting the environmental and economic problems present in households and rural communities today. This investigation will examine gender issues with respect to the program, and develop means to engage women as effectively as possible in program design, delivery, and evaluation.

5.3.4.2. Gender Analysis and Identification of Issues

Problems facing rural communities in Western China include severe environmental degradation, inadequacies in health and nutrition, low income, and lack of income-generating opportunities and employment. Women in all parts of the world play a vital role in development as their lives are greatly impacted by the social, environmental and economic conditions facing their communities. In today's forward-looking society, the role of women is becoming increasingly complex. It is important to encourage women to participate in the different activities in their communities, making them active partners in improving their quality of life.

History of agriculture and the social status of women

Under the feudal land ownership system men constituted the primary labor force on the farm, while women did supplementary jobs at home including household chores, raising poultry, and weaving. Only in certain parts of the country did women do the bulk of farm work. In feudal times, men in China were usually subject to the rule of three authorities: political, clan, and religious. Women, in addition to these three authorities, were dominated by the men in their lives (father before marriage, husband after marriage, and son after the husband's death). Under the feudal system, women's labor was not recognized by the state, though they worked year round. Women were considered dependents supported by their husbands, who controlled the family financial resources. After New China was founded in 1949, along with the social changes in the rural areas, women's status gradually changed. Hundreds of millions of rural women participated in collective labor. Women now had their own income and could become income earners instead of depending on men for a living. As a result, their economic status, and their status in the family and society gradually improved. However, the principle of equal pay for equal work between the sexes was still absent. After working a full day, men usually got 10 working points while women got 8, in some areas only 5 or 6. While both were involved in farming, women also had additional activities including cooking, processing grain, and making clothing and shoes for themselves and other members of the family. This situation lasted until the end of the 1970s. In 1978, after China introduced the contract responsibility system and implemented economic reform, rural women had more freedom to arrange jobs according to their own age, physical ability, special skills, and other conditions. Work and household chores were increasingly shared between family members, and women played a growing role in production. In modern day China, the status of women in society and at home has been improved, but there is still much more that can be done to improve the quality of life for women and their families.

Women and Education

A study funded by the United Nations University shows that the average educational level of women is lower than that of their husbands. The primary reason women did not enter school were financial. In the elderly generation, this was followed by the reason that men were superior to women. The survey also shows that of women who dropped out of school before graduation, the primary reason was a lack of money for the elderly and middle-aged bracket, followed by the need to do farm work and a shortage of family labor. For the younger generation, the lack of money still plays an important role, but the difficulty of the educational system has increased, and most indicate that problems in studies were the reason school was not completed. This is because female schoolchildren

do much more housework than boys after school, which adversely affects their studies and marks. Girls are responsible for a number of chores including cutting and collecting green fodder, looking after young siblings, and helping with the cooking and washing. Implementation of the rural economic reforms has increased the activities of the farmers, and the pace of rural life. The adults are busy with their work, and as the families are small, young girls are often over-burdened with household chores, causing them to lose interest in their studies. As a result, many teenage female students drop out of school.

Women and Employment

The study funded by the United Nations University also illustrates that middle aged and women are primarily engaged in agriculturally related employment. Young women are also heavily involved in agricultural work, but also engage proportionally in non-agricultural work.

Reference: All-China Women’s Federation, 1993. *The Impact of Economic Development on Rural Women in China*. United Nations University, Tokyo, Japan. ISBN 92-808-0812-5.

5.3.4.3. Gender Equality Strategies

This project proposes a participatory development process where individuals and communities will be empowered to increase food production, renewable energy production and create sustainable livelihoods. The project encourages innovative community organizing and capacity building in women to take active roles to improve their quality of life. Given the historical context of China, increasing the development of women in a community is an area of difficulty and getting women involved must be focused on in every project task.

From a seasonal calendar generated in the PRA, we understand that women play a very important role in agricultural activities. Women are doing 2/3 agricultural activities with support from men and old family members and school children. However, men make most of the decisions. During an interview, women said that they always follow the instructions from their husband on farming activities because their husbands have more knowledge and received higher education than women. Please refer to Table 5 for the Seasonal calendar and gender analysis performed during the PRA in Dingxi.

	Activities	Who does what?		1	2	3	4	5	6	7	8	9	10	11	12	
		Man	Woman													
1	Spring broadcast	●	●		—											
2	Weeding		●				—									
3	Harvesting	●	●●						—							
4	Plowing	●	●●						—							
5	Fall harvesting	●	●●							—						
6	Plow & top application of chemical fertilizer	●	●								—					
7	Threshing	●	●									—				

8	Transport organic fertilizer	●	●															
9	Constructing terrace	●	●															
10	Housework, feeding livestock and poultry		●															
11	Look after old people and young children		●															
12	Washing clothes and cooking		●															
13	Prepare festival goods	●	●															
14	Decision making	●																
15	Work in outside	●	●●●●●●● ●●															

Varied activities will continue to be undertaken to improve the status of women within the family and community to ensure they are not marginalized. In the first year this involved the sensitization of both men and women to gender issues through a participatory PRA/ training process. Seminars and training sessions will be conducted involving men and women deconstructing gender roles in Chinese society. In particular, it has been noted through seasonal workload calendars that a major time-consuming activity for women on the farm is weeding. Furthermore, women don't receive any aid from men in this activity. The project aims to improve weed control on farms, as well as harvesting and plowing, to lessen the workload on women. Other ways the project aims to increase the quality of life of women is to increase the household income, education and awareness of local environmental and social issues, improved family health through the consumption of nutritious foods and a balanced diet, and encourage women to take their fate in their own hands by becoming community trainers and leaders. Opportunities for women in agriculture must also be enhanced by exposing them to sustainable methods of increasing productivity, and the important role farm management has in community strengthening. Women may still take an active part in household chores while at the same time generating their own income and participate in community activities to improve their standard of living. As women are trained and developed as partners in the production and marketing of farm products, specific training programs will be conducted to develop their complex role in the community. These programs will also make them aware of the importance of participating in socially productive work geared towards improvement of living standards for themselves and their families.

5.3.4.4. Formulation of Gender Equality Results

Table 6: Formulation of Gender Equality Results through project activities, outputs, outcomes and indicators.			
<i>Activities</i>	<i>Outputs</i>	<i>Outcomes</i>	<i>Indicators</i>

<p>1. Baseline data gathering and surveys 1.1 Collection and processing of agroecological assessment of farming systems 1.2 Socio-economic survey: detailed analysis of 30 to 40 households per site</p>	<p>Better understanding of the role of women in both the family and the community, and the socio-economic conditions that affect their lives and impact their families.</p>	<p>Increased focus on activities that enhance the status of women, and improve the socio-economic conditions that affect their lives and families.</p>	<ul style="list-style-type: none"> • Improved socio-economic conditions that affect women. • High interest in socio-economic projects
<p>2. Institutional Building Process 2.1 Participatory rural appraisal 2.2 Strengthening the capacity of Farmer's Organizations</p>	<ul style="list-style-type: none"> • Information from the PRA that identifies the needs/conditions of women. • The development of an ongoing participatory monitoring and evaluation process that specifically considers the position and inputs of women. • The active engagement of women in community organizations and projects, and their inclusion in planning, organizing, coordinating and leadership activities. 	<ul style="list-style-type: none"> • Ongoing efforts in the community that focus on the improvement of the status of women. Values development focusing on leadership, self-reliance, and gender sensitivity. • A community that has increased sensitivity to female leadership, and self-reliance, and women evolving as empowered members of the community. The capacity of community organizations are strengthened through the increased involvement of women. 	<ul style="list-style-type: none"> • Women as empowered members of the community. • Increased numbers of women in project planning, organizing, coordinating and leadership.
<p>3. Capacity building 3.1 Develop training modules 3.2. Perform farmer-to-farmer trainings. 3.3 Develop individual farm plans to implement ecological practices learned in trainings Identify and develop markets to increase household income and employment opportunities, and for promising farm products locally and regionally.</p>	<ul style="list-style-type: none"> • Education of men and women on environmental, biological, mechanical and agricultural topics with an integrated dialogue about gender issues, and an increase in women upgrading their knowledge and technical skills. Specifically, focus on training of men and women on the use / production of efficient farm implements and improved technical skills (improved water access, livestock production) that lessen the burden on women spend. • The development of individual farm plans and markets to increase household income and employment opportunities, with a focus on women. 	<ul style="list-style-type: none"> • Farmers Trained in environmental, biological, mechanical and agricultural topics, and local women with increased knowledge and technical skills. Men and women that can use farm implements, improved technical farming skills, methods and improved livestock production to ease the burden on women. • Clear understanding of the importance of agriculture in livelihood improvement and positive attitude toward farm work. • Implemented individual farm plans and increased market opportunities that raise household income and employment opportunities for women. • Active participation of women in community economic development and women recognized as partners in improving the quality of life and developing leadership and decision-making abilities. 	<ul style="list-style-type: none"> • The increased use of improved farm implements, skills, and livestock production that lessen the burden on women. • Number of women involved in community organizing, programming, coordinating and managing of agricultural projects. • Number of farm plans that increase opportunities for women. • Increased employment and market opportunities.

<p>4. Field Level implementation 4.1 Soil contouring 4.2 Revegetation 4.3 On farm trials including diversified crops growing nutritious and drought-tolerant vegetables.</p>	<ul style="list-style-type: none"> • Field level implementation of sustainable agriculture including soil contouring, revegetation and on farm trials to improve family income and increase production. • Farmers producing diversified crops including nutritious and drought-tolerant vegetables and grain legumes. 	<ul style="list-style-type: none"> • More ecologically sound agricultural production including soil contouring, revegetation, and improved production of diversified crops including more drought-tolerant vegetables and grain legumes. 	<ul style="list-style-type: none"> • Reduced soil erosion and increased production from farms. • Consumption of nutritious foods and improved family health.
<p>5.0 Communications and public engagement 5.1 Disseminate information to the public through conferences, publications, websites and presentations to interested parties 5.2 Video documentary production and distribution</p>	<ul style="list-style-type: none"> • Information available to the public through conferences, publications, websites, presentations. • Production and distribution of the agro-ecological village development primer and a video documentary production. 	<ul style="list-style-type: none"> • Public becomes more knowledgeable about the conditions faced by women and farmers in rural regions of China. 	<ul style="list-style-type: none"> • Number of public engagements including conferences, publications, websites and presentations to interested parties • Production of video documentary

5.3.4.5. Reporting Gender Equality

The project partners will collect sex-disaggregated data to ensure effective reporting of gender-related activities, and indicators. This data will include perceptions and actual experiences of women on their quality of life, and will report socio-economic indicators including income, livelihood, education, social status, daily activities, decision making, physical well being, and quality of life (access to medical care, quality of housing). Data and observations will be included in intermittent progress reports. Specific case studies will also be developed to assess the impact of the project on women and other gender issues. All impacts, outcomes, and outputs will be analyzed with an emphasis on gender sensitivity. These methods of reporting will determine how effectively the project addresses gender issues and benefits for women.

5.3.4.6. Conclusions

A systematic approach to the implementation of the project is important to ensure a high level of participation among women and encourage men to recognize the changing role of both men and women. Both sexes will be sensitized to understand the benefits they will acquire from such changes in their lives and appreciate the impact these will have on their community, economic status and environmental condition, both in the present and in the future.

Indicator

The development of a relevant gender strategy will be indicative of the successful implementation of this activity.

5.4 Field Level Implementation

The project will see the execution of individual farm plans across the region, employing remediative measures such as soil contouring and terracing, re-vegetation, reforestation and water conservation efforts.

5.4.1 Soil contouring

It is of paramount importance that the landscape ecology of these regions is restored. Without cessation of soil erosion through field contouring and revegetation, fields will continue to lose their productive potential. Site remediation efforts will also help reduce the damaging impacts of intense summer rainfall events and help conserve the limited water resources of the region. Main activities will include the design and implementation of soil conserving contours of the steeply sloped areas, water conservation and catchment areas.

In Dingxi, active measures will be taken to control the extreme soil erosion occurring in the area, with a focus on the remediation of 423 ha of land extremely susceptible to soil erosion, including 60 ha of terracing. The project will also involve the construction of 100 check dams, 190 water harvesting tanks and the making 13.6km of new road. In Zhunger, to reduce the annual soil erosion rate of 80%, and control sedimentation rates of 32,000 t/y, soil contouring and check dams will also be constructed to mitigate erosion in 61 ha of gully terrain. The majority of this work will be completed under the programming of the local bureau of soil and water conservation.

Indicator

The amount of agricultural degraded or environmentally sensitive land improved by soil contouring, as compared to baseline levels, will be indicative of the successful implementation of this activity.

5.4.2 Site Revegetation

Revegetation will help improve the quality of life for local residents by reducing the frequency and intensity of dust storms, retaining more water in the watershed, reducing siltation and greatly improving the quality, structure and stability of local soils. Presently, there are local efforts to introduce both Sea Buckthorn and *Caragana micophylla* to control soil erosion on steep slopes in this region. Sea buckthorn has been quite successful in alleviating soil erosion in gullies, and both caragana and sea buckthorn are being used on the severely eroded sloping lands. In gullies, sea buckthorn helps the recovery and enables the growth of perennial grasses and the naturalization of other tree species, which further helps stabilize environmentally sensitive areas. For the project, after the steeply sloped terrain has been adequately prepared and contoured, the land will be revegetated with grasses, shrubs and trees. In Dingxi, The project will involve the reforestation of 239 ha with shrubs and trees, and the revegetation of 126 ha with grass. In Zhunger, to reduce soil erosion and control sedimentation, 1543 ha of Seabuckthorn

will be planted and permanently established. The majority of this work will be completed under the programming of the local bureau of soil and water conservation.

Other activities also include the collection of information regarding climatically similar areas in North America to aid in better understand the agronomic practices of these regions, crops seeds, livestock, green manures and weeding techniques. This will be performed mainly by REAP agronomists.

Indicator

The amount of revegetated agricultural, degraded or environmentally sensitive land, as compared to baseline levels, will be indicative of the successful implementation of this activity.

5.4.3 On-Farm research

5.4.3.1. Learning Farms

The project aims to establish several “Learning Farms” in each community. Learning farms combine several approaches to introducing sustainable farming to communities:

- Adaptability trials (new varieties/crops, drought/water/salt resistant)
- Demonstration of (EFS) Ecological Farming Systems (contouring, composting, intercropping, multiple cropping, green manures, soil fertility management etc.)
- Soil and water conservation (windbreaks, checkdams, drip irrigation)
- Seed bank (living gene bank) and plant material multiplication (tree nursery)
- Breeding
- Appro-tech (farm equipment, on-farm energy management)
- Livestock (new varieties, sustainable fodder production)
- Weatherproofing farms (reducing vulnerability to vagaries of the weather)

These farms are coordinated by farmer trainers or other interested farmers that are willing to share their experiences and ideas with others. In this way, the farmer trainers can spend time working on maintaining and improving their own individual farms while strongly supporting community initiatives and the sharing of information and plant materials in the community. This also establishes a stronger connection between the test trials and the ecological trainings, and is ideal for farm visits and “out of class” field trips.

Learning farms can broaden development efforts by integrating several key ideas as techniques on one “regular” farm. They also avoid the concept of a terminal “Model Farm” with one model farmer, by placing the farmer and the farm at the center of learning in the community. Farmers feel the terminology “Learning Farm” is progressive as it does not create an image that a farm is “fully developed or perfect” or encourage arrogance in farmers. Farmers want to put the emphasis on farmer trainers creating a small commercial farm that is sustainable without outside support so that the development process can be feasibly replicated by other farmers.

The learning approach encourages the exchange and progression of ideas and the constant observation and assessment by the farmer trainer and others in the community. This process is greatly stimulates brainstorming sessions which can occur when the community gets together at the farm or during cross site visits that occur when farmer trainers and farmers come from other communities. Overall we believe this concept to be an important new orientation that is a logical evolution for the development of farmer-led ecological farming systems research and extension as it enables scarce resources for rural development to be used as effectively as possible.

5.4.3.2. Participatory Research

It has been identified through several initial meetings with farmers, feedback from local government extension personnel and through an agronomic survey of 30 rural households, that there is a strong desire to assess new crops and improved varieties of existing crops under cultivation. There is particular concern amongst the farmers to identify more drought tolerant crops, as drought presents a serious threat to their livelihood with their current production systems. There is also concern about the need to harvest more forage from perennial grasses and fodder trees to provide feed for the livestock under the new grazing restrictions on sloping lands.

As a summary, some of the initial ideas for the development of learning farms were:

- New plant materials and plant material/seed propagation
- Drought resistant vegetables and drip irrigation systems
- Water-conserving plants for steeply sloping areas
- Drought tolerant tree species that improve ground water availability
- Drought resistant animal fodder such as sohr gum sudan grass or millets
- Controlled grazing systems
- Improving soil fertility through green manures, improved crop rotations
- Reduced use and fertilizers by improving organic matter through minimal tillage, composting, growing crops with large root masses and crop residue utilization
- Multiple cropping systems
- Reduced use of pesticides, herbicides and fertilizers through weed, insect and disease control.
- Small scale soil and water conservation initiatives like windrows, mini-checkdams, permanent terracing, permanent pastures, cover cropping
- Salt-tolerant/ reducing plants into low-lying areas with high salt accumulation
- Management strategies for rats and other damaging pests
- Investigation of improved on-farm technologies such as threshing, weeding, hoeing, plowing and harvesting to reduce the work burden on women
- Processing of cereals into flour to improve the value of such products and reduce imports into rural communities

The research trials were established in the spring by the local soil project staff, on land volunteered by local farmer trainers. The plots are small which places at the farmers at least risk if the crops fail. Specialists in annual crops and perennial forage crops with an

understanding of the climatic conditions of Western China will be consulted to provide assessments of possible new crop and variety introductions.

Activities at the trial farms will involve tests and records of the new techniques and materials. Plant materials will be assessed by the project technical team and performance rankings made for various agronomic traits and yield. Promising varieties will then be increased into larger field strips through the crop verification process. Trials testing new varieties of interest and confirming characteristics of varieties that demonstrated high adaptability to local conditions will also be undertaken. Other on farm testing of plants and livestock systems will also be developed based on priorities identified by the community through the PRA process. The overall goal is to encourage farmers to take a more active role in developing participatory on-farm research as a tool for accelerating their plant and farming systems improvement. Efforts will be made to further the local understanding of the links between the farmers and the environmental conditions through the farmer training program and field trials.

5.4.4. Research activities to be examined and developed

5.4.4.1. Sustainable Soil Fertility Management

It appears that soil fertility conditions have seriously degraded in both communities due to intensive cropping of annual crops such as corn, sunflower, potato, wheat and millet. This is particularly the case for row crops, which can generate serious soil degradation problems. A number of new possible strategies need to be introduced to work towards develop farming systems which maintain or build up soil fertility on the farms, these include:

- Reducing soil tillage: Where possible, reduce fall soil tillage and eliminate the common practice of double plowing (fall and spring) used in the area. Minimum tillage systems should be tested and promoted to reduce soil erosion and the intensity of soil cultivation.
- Introducing drought tolerant grain legumes: Developing chickpeas, and higher water use efficiency field peas as new crops to expand crop rotations in the communities and enable a reduction in the acreage of annual row crops
- Introducing moderate to high yielding perennial forage crops on marginal lands to reduce cultivation of annual crops.
- Reduce the collection of field crop residues for livestock feeding and household energy use: Allow decomposition of residues in the field where possible to reduce soil erosion risks (by increasing residue cover) and for soil improvement.
- Composting: making compost from livestock manure and organic residues to help increase soil organic matter levels and increase soil biological activity. Turning manure into compost also helps facilitate application to more distant fields where manure is infrequently applied. These areas often have the most serious problems with declining soil organic matter levels.
- Introduce annual green manure crops periodically into the crop rotation. These can include sweet clover and annual grain legumes, like lupins and peas, which help maintain soil organic matter levels and improve overall soil fertility.

5.4.4.2. Optimizing Livestock Production in Response to New Grazing Policies

In China, much of the rural income has historically come from livestock rearing, particularly goats for the cashmere industry. The many years of excessive grazing from sheep and goats on the highly erodible soil has created severe gully erosion over much of the area. As a result, the Chinese government recently introduced new legislation stating that the grazing of livestock on steeply sloped land was no longer permissible. The new grazing regulations are greatly affecting the farmland and livelihoods of the farmers in the watershed. New livestock rearing practices need to be introduced to protect the fragile landscape and to raise the low income levels the farmers are currently experiencing. Several methods have been identified to create these opportunities for farmers. On sloping fields, soil conserving perennial forages can be introduced, which could enable farmers to continue their livestock raising activities while continuing to protect the soil resource from erosion. In particular, improved forage grasses from North America could be grown, including both cool-season (grasses and legumes), and warm-season species (grasses). Some of the species could include testing crested and intermediate wheat grasses, chicory, sainfoin and other warm season grasses including switchgrass and big and little bluestem. Many of these species are used in the northern Great plains of the United States and in the southern Canadian prairies. This region has a similar semi-arid continental climate and latitude as northern China. New breeds of livestock and animal rearing practices also need to be demonstrated and trainings conducted.

5.4.4.3. “Weatherproofing Farms” through Improving Water Conservation and Water Use Efficiency

Water management remains a critical issue in increasing farm production and in providing more stable crop yields in the communities. A number of strategies can be taken to improve plant soil water relations.

- Emphasize soil organic matter improvement, more water is held in soils with high soil organic matter content.
- Introduce more drought tolerant annual crops: Good possibilities for the communities are new annual crops like chickpeas and flat peas and more water use efficient field peas and soybeans. These can be tested in community trial farms.
- Introduce warm season grasses which are drought tolerant because of their high water efficiency and have deep root systems (2-3 metres deep).
- Introduce drought resistant animal fodder such as sohrum sudan grass or millets
- Increase reliance on the use of biological N sources through expanded use of grain legumes, improved manure management systems and soil mineralization processes as chemical fertilizer tends to increase water stress problems for plants from the salts present in the fertilizer.
- Continue to invest in water impounding, and irrigation systems
- Expand the use of trees in windbreaks to create a more favorable microenvironment for plant growth. Windbreaks reduce evaporation and can increase humidity levels. Fodder types of willow trees can be planted to also provide forage in dry periods for livestock. Species selected should improve ground water availability

- Introduce drought resistant vegetables and drip irrigation systems
- Examine water-conserving plants for steeply sloping areas

5.4.4.4. Crop and Vegetable Development Priorities

The Dingxi Agro-Ecological farm survey indicated 88% of their farm income was from cropping. Not surprisingly, the community’s main interests for farm development were in crop production. Generally their interest in crop improvement was directly related to the area under cultivation, with potatoes and alfalfa being of most importance to the community. Sheep were the highest priority for improvement due to the need for developing “in-house” rearing as result of changes in grazing policy.

Dingxi Priority Rankings		
Crops	1	potatoes and alfalfa
	2	peas and lentils
	3	corn and wheat
	4	flax, buckwheat, millet,
	5	bean and soybean
Livestock	1	sheep
	2	chickens, rabbits, cows and pigs

The communities in Zhunger were generally were interested in growing crops only for household food security. Most farmers felt increasing production of crops for market sale would leave them mired in poverty as the land was not generally well suited to annual crop production. They felt that their income base could be more securely developed by improving their quality of livestock and the quantity and quality of forage production. Most farmer trainers felt that buying male breeding stock of improved livestock for crossbreeding with their existing breeding stock was the most viable way to transform their breeds over to improved types adapted to in-house feeding.

Zhunger Priority Rankings		
1	Livestock	Locally adapted to conditions and in house feeding
2	Forages	Improve quantity and quality of stored feeds with an emphasis on alfalfa, and secondarily perennial grasses and sorghum sudan grass
3	Food crops	Emphasis on food security crops such as potatoes, millet and corn. Introduce more grain legumes including soybean, kidney bean and peas.
4	Vegetables	Chinese cabbage , green beans, tomato, radish, carrots, cucumber and green pepper
5	Shelterbelt species	Drought resistant trees with economic benefits especially apricot and Chinese date

There were a number of new crops that were identified through discussions with communities and plant scientists that require further assessment in the next two years. These include

1. Annual Crops: Sweet potato, chick peas, soybeans, winter cereals, peanuts
2. Forage crops: warm season grasses including switchgrass, big bluestem and sorghum sudan-grass
3. Cool season perennial forages including bromegrass, sheep grass, crested wheatgrass and sainfoin
4. Fruit trees: including Saskatoon berry, choke cherries, sand cherry, sour cherry, plums, apples, grape
5. Drought tolerant Vegetables: green beans, edible soybeans, edible peas, scorzonera, okra, lima beans, faba beans, amaranth and lentils

5.4.4.5. Sustainable pest control

In year two of the project, management strategies for rats and other damaging pests will be examined. These were issues of importance as identified through the PRA process and working with the farmer trainers on farm sustainability. Presently in Western China, particularly in Dingxi, farmers have identified rats as the most problematic pest control problem they have. They mentioned that at some points during the year their fields were overcome by the rodents, which severely affected crop yield. The rats have become so profuse that they reach tremendous sizes and are all the more difficult to remove, with cats even unable to eradicate them. Farmers currently use poisons, which are dangerous and expensive, or manual rat traps. They have also introduced housecats as a solution but the cats have experienced poisoning from the rat bait and generally are too small to successfully oppose a fully-grown rat.

Project staff will examine the possibility of introducing a number of sustainable pest control strategies. One potential alternative is the sustainable introduction of rat terriers to several farms. Bred primarily as farm and ranch dogs to hunt, protect and guard against vermin, Rat Terriers have strong jaws and are known for their determination and quick, agile movements, which enable them to kill rats and other vermin and small game (<http://www.ratterrierclub.com/standard/index.html>). During the 1910s and 1920s, the Rat Terrier was one of the most common farm dogs in the United States. Additionally, they make excellent companions for children and adults of all ages (<http://loganlane.freeyellow.com/page2.html>). Rat Terriers love the outdoors and need fresh air and sunshine, just as any other breed of dog. They are easy to maintain and can survive in most climates from extremely hot temperatures to extremely cold. Generally 10-25 pounds, they are dogs that require little grooming, as their coats are short and slick and are healthy and hardy dogs. They make excellent pets indoors as well as outdoors.

5.4.4.6. Gender equality on the farm

Year two will also focus on understanding gender roles on the farm and the development of initiatives that reduce women's labour on the farm. This includes the investigation of techniques and improved on-farm technologies that reduce tasks that are currently done primarily or only by women on the farm such as:

- Reduction in amount of effort spent on weeding, plowing and harvesting
- Improved hoes and other appropriate farm tools
- Simple mechanization of threshing

Indicator: The number of on farm trials established and the number of new crop and cultivars collected and under assessment.

5.5 Communications and public engagement

The project outcomes will continue to be shared with others in the development community, both in the host country and abroad, so that any lessons learned may be applied elsewhere. The general public will be made increasingly aware of the project, promoting a better understanding of North-South issues and increasing support for international development. REAP believes that a free exchange of information is vital to the development process, and to this end the organization shares information gained from education and research projects whenever possible by way of published articles, public talks and the REAP website.

The project will engage the public in English and Mandarin through a variety of communications strategies including newsletters and other print media, web sites, conference presentations and videos. REAP-Canada has and will continue to post articles and project reports in periodicals and newspapers in the communities, as well as in our newsletter and also post them regularly on the internet. REAP will continue its tradition of reporting on international projects at national and international conferences dedicated to ecological agriculture, development and food security. REAP actively engages a variety of groups in its agro-ecological village programming in the Philippines and will continue to expand these activities for the Western China project using similar approaches.

5.1 Disseminate information to the public about the project through conferences, publications, websites and presentations to other interested parties

Through a diversity of communication methods including public presentations, written articles, a short documentary video and web site, the agro-ecological villages will be widely publicized.

The project outcomes will be shared with others in the development community, both in the host country and abroad, so that any lessons learned may be applied elsewhere. The general public will be made increasingly aware of the project, promoting a better understanding of North-South issues and increase support for international development. REAP believes that a free exchange of information is vital to the development process, and to this end the organization shares information gained from education and research projects whenever possible by way of published articles, public talks and the REAP website.

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In China the project team will implement intra-communication on the website <http://www.swcc.org.cn>, through newsletters and organize presentations for workshop and technical conferences. The Chinese team has a history of organizing large international conferences in Beijing. These events can highlight the project through field tours of national and international delegates. Communications will also be achieved locally through the economic development office in each prefecture in which the two project sites are located.

It is anticipated that as the project proceeds, a development primer on agro-ecological village programming will be created. This production will detail specifically what is needed, and the methodology used to encourage rural communities to become more self sufficient through sustainable agriculture and ecological production methods. The primer will include lessons on how to assess community needs, developing a custom training program, gender issues, energy use and biofuel consumption, and ecological means to achieve greater self-reliance. The primer on how to implement an Agro-ecological village in China, could be produced by REAP-Canada with the co-operation of the China Green Food Development Centre.

Indicator

The development of a training manual for the establishment of an agro-ecological village will be indicative of the successful implementation of this activity. Also monitored will be the number of conferences and people reached through the public engagement process.

5.2 Video documentary production and distribution

Beginning in year two and continuing through the course of the project, a series of video productions are planned to portray the evolution of the agro-ecological villages. The videos will be produced in both English and Mandarin. The videos will cover the specific challenges and successes being experienced at each of the two sites and will describe the step-by-step process of agro-ecological development. It will also illustrate the benefits that the approach can bring to the community over time. Upon completion, it will be publicized at international conferences, workshops and public forums to increase the knowledge and public engagement in Chinese issues, and to promote the Agro-ecological approach for use as a development model throughout China. This work will be coordinated in partnership with Luna Mirasol Productions, which is assisting REAP in its agro-ecological video production work in the Philippines. The Manila based company has

made two previous video documentations in the Philippines on rural development challenges facing peasants. Using the same company for coordinating our agro-ecological village activities will provide some level of consistency in developing a series of videos on the programming in various geographic regions of the world.

Indicator

The development of a video documentary production will be indicative of the successful implementation of this activity.

VI. Resource Requirements

6.1 Personnel

6.1.1. Project staff

Canadian Project Manager - Roger Samson, REAP Canada, Director of International Programming

Shall be responsible for overall written and financial reporting of the project to CIDA. Will oversee project management and implementation. Also responsible for facilitating the appropriate arrangements for the roles and responsibilities of the Canadian partner as described in this project. May also provide project technical support.

Chinese Project Manager - Mr. Henry Lu, Deputy Director, Sino-Canada Soil Conservation Cooperation Project Office, China National Administration Center for Sea buckthorn Development and Chinese Ministry of Water Resources.

Shall be responsible of coordinating staff to implement field level activities, conducting field monitoring and evaluation, act as the link between project field officers and REAP staff, and will network with other like-minded groups who can further the projects goals and objectives. He will be in in-charge of over-all data consolidation in China for submission for project reporting. He will be responsible for over-all finance consolidation of project expenditures in China and submission of expenses to REAP-Canada.

Canadian Project Officer - Claudia Ho Lem, REAP Canada, Research Associate

Shall provide support role to the project manager in administering REAP's roles and responsibilities to the project. Shall be directly involved in coordinating with Chinese project partners, in regards to meeting financial, trainings, gender issues, narrative reporting requirements and project monitoring and evaluation.

Chinese Project Officer (Dingxi) – Mr. Gao Lin

Based in Dingxi, shall be responsible for coordinating local finances, project staff and organizers, activities, training programs, on-farm research, survey administration data collection and local report generation.

Chinese Project Co-officers (Zhunger) - Mr. Yin Sheng Jun and Dr. Xu Shuangmin, Division Chief, Sino-Canada Soil Conservation Cooperation Project Office, China

National Administration Center for Sea buckthorn Development and Chinese Ministry of Water Resources.

Based in Zhunger, shall be responsible for coordinating local finances, project staff and organizers, activities, training programs, on-farm research, survey administration data collection and local report generation.

Chinese Community Organizer (Dingxi) / Chinese Community Organizer (Zhunger)

Based in respective local community, will be responsible for facilitating organizational strengthening activities, project analysis, the necessary social activities to prepare for technical training and the training activities. Also responsible for coordinating activities with local project officer, including monitoring field implementation activities and trainings.

6.1.2. Training Staff

External Farmer trainers/advisors

Expert team enlisted to train the first and second liners in the farmer-to-farmer training program.

Farmer trainers

Local farmers selected and trained to deliver project trainings to community on sustainable agricultural techniques including soil and water conservation, revegetation, and diversified farming. Farmer trainers include both experienced farmer trainers (first liners) and farmer trainers in training (second liners).

6.1.3. Consultants

Dr. Johanna Pennarz

Is native to Germany, but now resides in China, and has worked there for 10 years. Her main areas of focus are rural poverty alleviation and ecological farming. She will aid in project design, monitoring and evaluation and help identify and provide solutions for challenges that may be experienced as the project evolves. She recently coordinated a German sponsored project to develop Organic Farming in China.

Dr Neal Stoskopf, President of REAP-Canada

Will play a role in the Project Technical Team. He has 18 years of experience working on development projects in China and was awarded a prize from the Chinese government for increasing food production.

Mr. Zong Huilai

Is a Chinese national schooled in Agricultural Economics and specializing in organic farm production, rural development and poverty issues. He has had overseas training in facilitation and extensive experience in participatory training methods focused on the rural areas of China. Mr. Zong will be involved in the facilitation of the PRA and trainers training activities.

VII. Management Strategy

7.1 Project Management and Implementation Structure

Project Steering Committee (PSC)

The PSC shall include the Canadian partners, the ICRTS, and DSWC. The committee shall be responsible for the overall supervision and coordination of the project implementation, field operations, and finances. They are also responsible for the joint project review, assessment and planning, and direction setting and policymaking.

Local Project Management Team (PMT)

The local PMT will be responsible for local implementation of the project at the county/township level, with a separate PMT for each project site, Dingxi and Zhunger. The PMT will be headed by the local project implementing partners from the Department of Soil and Water Conservation and the local village group, and will be directed by the Local Project Coordinator of the BSWC. The PMT will also include a local finance officer and farmer trainers.

Project Implementing Team (PIT)

The Project Implementing Team (PIT) is composed primarily of local community organizers, village group leaders, farmer trainers and farmers, and local government extension personnel. The PIT shall facilitate project organizing and implementing, coordinating and conducting technical trainings and on-the-job training/coaching, be involved in the field implementation and on farm research and provide a link between the community and the PMT. They shall be involved in recording the technical trainings (topics, locations, participation, women) and other community activities such as the development of field-level implementation. They will also provide feedback and reports during the project assessment and planning sessions on the status of their logistical work to the local project coordinator and PMT.

Project Technical Team (PTT)

The Project Technical Team (PTT) is composed of local farmers leaders, farmer trainers, local government extension personnel, other technical persons and farmers from the farmer technical groups. The PTT shall be responsible for assisting and conducting technical trainings and on-the-job training/coaching, and be involved in the field implementation and technical aspects of on farm research. They will also provide feedback and reports during the project assessment and planning sessions on the status of their work to the PMT.

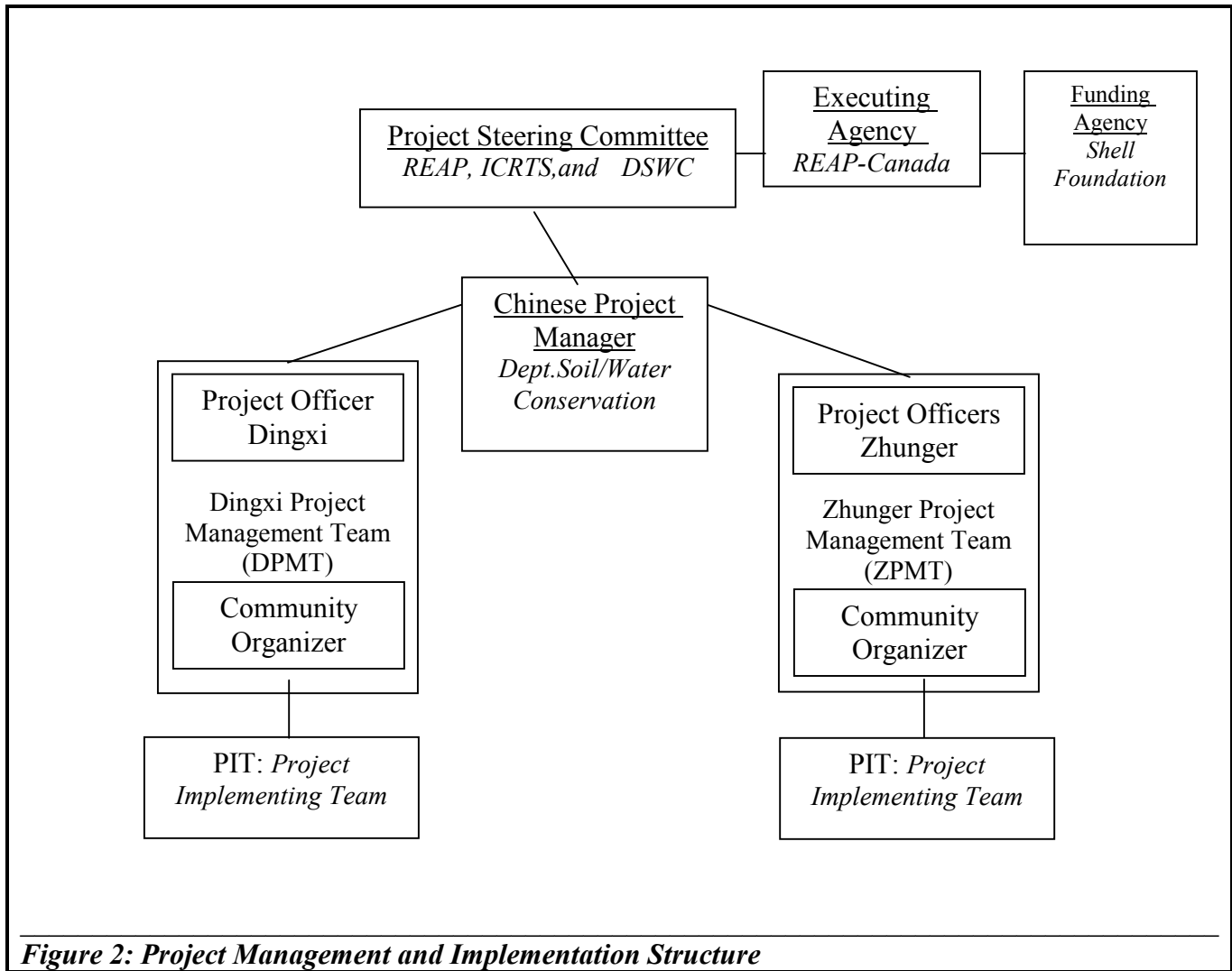


Table 7: Official WCAEV Project Management and Implementation Team Members		
Team or Committee	Official Team Members Dingxi County	Official Team Members Zhunger County
Project Steering Committee	Mr. Roger Samson Miss. Claudia Ho Lem Mr. Lu Shun Guang Mr. Gao Lin Dr. Xu Shuangmin	
Sub-Project Officers	1 Mr. Shui Zhaolin, Director of County Bureau for Soil Conservation 2 Mr. Gao Lin, Sub-projector manager 3 Mr. Zhao Yingkui, Assistant Engineer of Bureau for Soil Conservation 4 Mr. Yuan Zhenguo, Vice-governor for Cankou Township 5	1 Mr. Fu Fulin, Director of County Bureau for Soil Conservation 2 Dr Xu Shuangmin, CACSD, Sub-projector manager 3 Deputy Director of Bureau for Soil Conservation, Sub-projector manager 4

	Mr. Zhang Juliang, Leader of Fengjiacha Village, Sub-project Coordinator	Mr Zhang Jianjun, Vice-governor for Nuanshui Township 5□□□□ □□□□□□□□□□□□□□ Mr. Yan Yuqing, Leader of Sujiata Village, Sub-project Coordinator
Community Organizers	Mr. Zhang Juiliang Mr. Cao Yan Yu Mr. Li Jun Mr. Yang Hui Mrs. Gao Cunying	Mr. Xu SanYin (Nalingo) Mr. Yan DangFu (Bainiliang) Mr. Su ZhongHuan (Sujiata) Mr. Li SanNiao (Jiajiayan)
Project Implementing Team (PIT) □□□□□	1□□□□ □□□□□□□□□□ Mr. Yuan Zhenguo, Vice-governor for Cankou Township 2□□□□ □□□□□□□□□□□□□□□□ Mr. Zhang Juliang, Leader of Fengjiacha Village, Sub-project Coordinator 3□□□□ □□□□□□□□□□ Mr. Chao Yanyu, Co-Leader of Fengjiacha Village 4□□ □ □□□□□□□□□□□□□□ Mr. Li Jun, Co-Leader of Fengjiacha Village 5□□ □ □□□□□□□□□□ Mr. Yang Hui, Secretary of Fengjiacha Village 6□□□□ □□□□□□□□□□□□□□ Mr. Bi Fuzhong, Leader of Group 1 7□□□□ □□□□□□□□□□□□□□ Mr. Zhang Shangtang, Leader of Group 2 8□□□□ □□□□□□□□□□□□□□ Mr. Ma Zhireni, Leader of Group 3 9□□□□ □□□□□□□□□□□□□□ Mr. Yang Shiqing, Leader of Group 4 10□□ □ □□□□□□□□□□□□□□ Mr. Wang Jun, Leader of Group 5 11□□□□ □□□□□□□□□□□□□□ Mr. Yang Shicheng, Leader of Group 6 12□□ □ □□□□□□□□□□□□□□ Mr. Zhang Xiong, Leader of Group 7 13□□□□ □□□□□□□□□□□□□□ Mr. Zhang Shixiong, Leader of Group 8 14□□□□ □□□□□□□□□□□□□□ Mr. Zhang Shengming, Leader of Group 9	1□□□□ □□□□□ □□□ Mr Zhang Jianjun, Vice-governor for Nuanshui Township 2□□□□ □□□□□□□□□□□□□□ Mr. Yan Yuqing, Leader of Sujiata Village, Sub-project Coordinator 3□□□□ □□□□□□□□□□ Mr. Liu Jianhua, Assistant Engineer of Bureau for Soil Conservation 4□□□□ □□□□□□□□□□□□□□ Mr. Xu Sanying, Leader of Nalingou Group 5□□□□ □□□□□□□□□□□□□□ Mr. Yan Dangfu, Leader of Baniliang Group 6□□□□ □□□□□□□□□□□□□□ Mr. Su Zhonghuan, Leader of Sujiata Group 7□□□□ □□□□□□□□□□□□□□ Mr. Zhao Yousheng, Leader of Aobaoyan Group 8□□□□ □□□□□□□□□□□□□□ Mr. Li Sannao, Leader of JIajiyaozi Group
PTT and Farmer Trainers □□□□□	1□□ □ □□□□□ Mr. Gao Lin, Ecological Expert 2□□□□ □□□□□ Mr. Zhao Yingkui, Assistant Engineer of Bureau for Soil Conservation 3□□ □ □□□□□□□ Mr. Xing Guo, Agronomist Of County Bureau of Agriculture 4□□□□ □□□□□ Mr. Chao Yanyu, Rain Harvesting Expert 5□□□□ □□□□□ Mr. Chen Zhiyi, Farmer's Trainer 6□□ □ □□□□□ Mr. Zhang Xiong, Farmer's Trainer 7□□□□(□) □□□□□ Ms. Gao Chunyin, Farmer's Trainer 8□□ □(□) □□□□□ Ms. Lu Jing, Farmer's Trainer 9□□□□ □□□□□ Mr. Yang Jianbin , Farmer's Trainer 10□□□□ □□□□□ Mr. Wei Hongping, Farmer's Trainer 11□□□□ □□□□□ Mr. Zhang Xueying, Farmer's Trainer 12□□□□(□) □□□□□ Ms Li Cuilian, Farmer's Trainer	1□□□□ □□□□□□□□□□□□□□ Dr. Xu Shuangmin, Planting Expert 2□□□□ □□□□□□□□□□□□□□□□ Mr Liu Jianhua, Assistant Engineer, Soil Conservation Expert 3□□□□ □□□□□□□□□□□□□□□□ Mr. Luo Wenbin□Agronomist, County Bureau of Agriculture 4□□□□ □□□□□□□ Mr. Wang Wenqing, Local Agricultural Expert 5□□□□ □□□□□□□□□□□□□□□□ Mr. Xu Sanying, Farmer's Trainer of Nalingou Group 6□□□□ □□□□□□□□□□□□□□□□ Mr. Xu Wushe, Farmer's Trainer of Nalingou Group 7□□□□ □□□□□□□□□□□□□□□□ Mr. Yan Dangfu, Farmer's Trainer of Baniliang Group 8□□□□□□□□□□□□□□□□□□□□□□ Ms. Feng Furong, Farmer's Trainer of Baniliang Group 9□□□□ □□□□□□□□□□□□□□□□ Mr. Su Zhonghuan, Farmer's Trainer of Sujiata Group 10□□□□ □□□□□□□□□□□□□□□□ Mr. Su Jinliang, Farmer's Trainer of Sujiata Group 11□□□□ □□□□□□□□□□□□□□□□ Mr. Zhao Yousheng, Farmer's Trainer of Aobaoyan Group 12□□ □ □□□□□□□□□□□□□□□□ Mr. Yan Jin, Farmer's Trainer of Aobaoyan Group 13□□□□ □□□□□□□□□□□□□□□□ Mr. Li Sannao, Farmer's Trainer of JIajiyaozi Group 14□□□□ □□□□□□□□□□□□□□□□ Mr. Jia Hairong, Farmer's Trainer of JIajiyaozi Group

7.2 Project partners roles and responsibilities

The two main project partners have defined the major tasks for the projects implementation. REAP will take the lead in organizing and training aspects of the project utilizing resources from the Shell Foundation. The Department of Soil and Water Conservation will lead the Field Level Implementation using resources provided by the Chinese Central Government. The Project Implementing Team (PIT) consisting of members of the various agencies and local farmer organizers and leaders, will be involved to ensure there is a coordinated implementation effort at each site. REAP Canada will take the lead in reporting to the Shell Foundation.

At the initiation of the project, a joint planning meeting for various project partners will be held to further discuss respective roles and responsibilities for implementing the project, refine timetables and identify staffing requirements. An annual workplan will identify milestones for the completion of each activity. Bi-Monthly assessment meetings and a bi-annual general project evaluation will provide a formal structure through which project participants can evaluate progress and take corrective action as required.

7.2.1. Detailed project planning and assessment

The project partners will develop a detailed workplan for the activities/outputs that they will be responsible for. The workplan will identify indicators and expenditures associated with the completion of each activity. These workplans will be reviewed/monitored on a monthly basis with corrective actions taken as required. REAP will prepare bi-monthly activity reports to monitor the project's overall progress. The respective project managers will contact one another immediately if any issues arise or irregularities occur.

7.2.2. General project evaluation

Twice a year the project steering committee will meet to review the project's implementation. At these meetings, project staff and local beneficiaries will evaluate the implementation of the project over the previous six months, and will create a general plan for the coming six months. These meetings will be a valuable opportunity for project participants to share information and strengthen their programming. Additionally, the results of the biannual audits will be presented at these meetings to keep all participants informed about the project's finances.

The project will also be continually monitored by the community under the implementation of the Participatory Monitoring and Evaluation program established by the PRA. The results of this monitoring will be fed back to the local project management teams.

7.2.3. Inter-partner Reporting

The ICRTS will take the lead in ensuring there is adequate reporting from all of the implementing partners in China. The project partners will exchange monthly updates outlining the status of the project programming and work plans, and quarterly reports

outlining in detail the status of the project. This will include reviewing the status of the project activities, concerns, outputs and performance indicators. Project staff will contact one another immediately if challenges arise or irregularities occur.

7.2.4. Financial Management

REAP-Canada will be responsible for the overall financial report consolidation for submission to the to Shell Foundation. The ICRTS will be responsible for the financial reporting and consolidation of Chinese expenditures. All implementing partners will be responsible for the documentation of finances, bookkeeping and accounting of their budget allocation. The project partners will work together to develop quarterly financial forecasts. At the outset of each year, a financial plan will be presented at the joint planning meeting to enable all project partners to understand the anticipated flow of expenses for the year. Quarterly financial and semi-annual written reports will be prepared to track project progress.

7.2.5. Partner Roles and Responsibilities

Please refer to Table 9 for an outline of project partner roles and responsibilities. These responsibilities remain tentative and must be further elucidated between the implementing groups once core teams/personnel have been assembled.

Table 8: Partner Roles and Responsibilities					
Roles and Responsibilities <i>(X indicates responsibility, XX primary responsibility)</i>	Project Partners				
	REAP	ICRTS	Local BSWC	Farmers Groups	Outside Consultants
Project Management					
Project status reporting and contract mgt with Shell Foundation	XX	X	X		
Joint project review, assessment and planning	X	X	X	X	
Coordination of Implementing Partners		XX	X	X	
Field Level Reporting	X	XX	X	X	
Field Site Monitoring	X	X	XX	X	
Financial Management					
Overall financial report consolidation to Shell Foundation	X				
Financial report consolidation – Chinese expenditures		X			
Documentation of finances, bookkeeping and accounting of individual partner’s budget allocation	X	X	X	X	

1. Baseline data gathering and surveys					
1.1 Collection / processing of required baseline community data, initial agroecological assessment of farming systems	XX			X	X
1.1 Collection and processing of soil conservation data		XX	X		
1.2 Development and Analysis of socio-economic survey	XX	X	X	X	X
2. Institutional Building Process					
2.1 Perform participatory rural appraisal	X				XX
2.1 Participate in participatory rural appraisal	X	X	X	X	
2.2 Strengthening the capacity of Farmer's Organizations		X	XX	X	X
2.2 Community organizing/education & training		X	XX	X	X
3. Capacity building					
3.1 Develop training modules	XX		X	X	X
3.2 Initial Training of Farmer Trainers	X		X		XX
3.2. Perform farmer-to-farmer trainings			X	XX	
3.2 Ongoing Training of Farmer Trainers			X	XX	
Technical support to farmers' initiatives			X	X	X
3.3 Develop individual ecological farm plans			X	XX	X
3.5 Develop project gender strategy.	XX	X	X	X	X
3.5 Implement project gender strategy.	X	X	XX	X	X
4. Field Level implementation					
4.1 Soil contouring		X	XX	X	
4.2 Revegetation		X	XX	X	
4.3 On farm trials	X	X	X	XX	
5.0 Communications and public engagement					
5.1 Disseminate information to the public through conferences, publications, websites and presentations to interested parties	XX	X			
5.2 Video documentary production and distribution	XX	X			X

III. Risks and Assumptions

During implementation

The outbreak of SARS in Asia established international travel advisory warnings and behavioral changes such as restricted contact between community members in rural China. This limited project activities during April to June of 2003 due to the travel warnings and restricted contact between community members in rural China. Precautions were taken to ensure all project staff and beneficiaries remain healthy and at the lowest risk possible and restrictions on travel and contact have been lessened. Project activities have generally resumed to normal while at all times respecting health and safety guidelines to minimize risk for the future.

Another risk to the project during the first year of implementation was having a key project staff member, Mr. Li Liye, retire shortly after project start-up. This particular individual had many community contacts, in the area which he had developed over many years. This initially delayed project development somewhat at the site. The new Zhunger Chinese Project Co-officer Mr. Yin is working in conjunction with Mr. Liu, to establish relationships with the local farmers and other governmental officials. Both Mr. Yin and Mr. Liu are local members of the Bureau of Soil and Water Conservation and have been working on the project since its conception in July of 2002 and previously participated in many project meetings and training sessions.

A risk during project implementation is drought, which could threaten the community's progress towards self-reliance and reduce income levels. It would reduce production of rain-fed crops and limit the water supply for irrigation of high value crops. It would also hinder re-vegetation efforts on highly erodable slopes. A less serious perceived risk is the potential for conflicts between organizations or individuals. Efforts will be made to mitigate a lack of water through the introduction of drought-resistant plant species and water efficient farming practices. Water holding ponds, check dams and irrigation systems for cash crops will be introduced or enhanced.

Farmers may be reluctant to participate in project activities because of a short-term need to generate income and may continue to focus on monocropping potatoes or wheat as cash crops. The benefits of ecological agriculture may not become evident until demonstration projects have been established. The project then, must continue to acknowledge local potato production but focus on farm diversification and sustainable farming systems.

With any community organization activity, there is the chance that the bottom up process will encourage farmers organizations to become more political in scope. In modern day China, this is unfavorable considering the difficult socio-economic and oppressive conditions the populace face during the move from communism to capitalism, and the governmental units might consider this a serious risk. Thus, concerted efforts will be made to incorporate local community initiatives with governmental objectives, and to develop a common goal that all can work towards without conflict.

There is the risk that the communities are not ready for the type of development the project entails. Efforts have been made to determine that the communities involved have already had some exposure to development and organizing efforts. The project work plan

will be translated into mandarin so that the overall developmental objectives may be understood. Project coordinators will ensure that the government sets a sustainable pace for the reform, and ensure that the government extensionists can develop important new roles in working with the communities as they evolve (e.g. market development).

As China has a history characterized with gender inequality, there is the risk that men will not understand or incorporate ideas of women and empowerment. Efforts will be made through trainings and the active engagement of women, to ensure that both men and women recognize the valuable contribution women can make to community development.

After implementation

The project participants may view the project simply as a dole-out from Shell, and participate solely for the capital gain, discontinuing project efforts once the project is completed. To avoid this, the trainings and community building efforts must include an educational component on the social status of the community, and how the project aims can benefit the community. The project is designed to ensure sustainability, and the participatory process used will encourage farmers to become actively involved in the project, creating a sense of ownership that should be carried out long after project completion. The strong emphasis on capacity building in the project minimizes the risks that the process of sustainable community development will not be sustained, and many of those helping facilitate the project will remain as resource people for the community. The project team will ensure that the farmers institutions and local government resource people will continue to be in place and provide support services to the community to continue their development efforts.