WESTERN CHINA AGRO-ECOLOGICAL VILLAGE DEVELOPMENT PROJECT

Socio-Economic Survey Results 2003

May 2003

Submitted to

SUSTAINABLE COMMUNITIES PROGRAMME SHELL FOUNDATION UNITED KINGDOM

by

Resource Efficient Agricultural Production (REAP)-Canada
*Box 125, Maison Glenaladale,
Ste. Anne de Bellevue, Québec, Canada, H9X 3V9*

In Partnership with

Department of Soil and Water Conservation, *Ministry of Water Resources
Lane 2 BaiGuanglu 2, Xuanwu District, Beijing, China*

Background and Objective

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. The extensive 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 and high silt output from erosion is so serious that during the past ten years the Yellow River has ceased flowing 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 the interrelated challenges of environmental degradation, inadequacies in health and nutrition and low income generating opportunities in the region. The Western China Agro-Ecological Village Development (WCAEV) Project was established in July 2002, to assist the people in communities in Gansu province and in Inner Mongolia. 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 km^2 and erosion has affected 100% of this region with annual soil loss rate of 5400 tonne/km^2 (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

dessert. It will involve 230 households from the 4 villages Sujiata, Nalingo, Bainilaing and Oboyen within the watershed.

The long-term objective of the project is to mitigate poverty and increase the self-reliance of marginalized Chinese farmers living in these environmentally sensitive areas, while reclaiming their degraded environment. 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, while at the same time protecting and enhancing the natural resource base. The expected impacts of the project include the following:

- Improved environment through increased adoption of ecological farming systems
- Reduced poverty and outward migration though increased income, employment and agricultural production and marketing
- Improved health and self-reliance through increased diversity of farm products
- Improved gender equality and community capacity building through training, education and participatory farm management and research

Careful monitoring of performance indicators is an effective way to achieve desired project impacts and for that reason is an integral part of the Agro-Ecological Village development model. Baseline information on WCAEV beneficiary communities was obtained before the project was initiated and during its initial stages. Data will continue to be collected during implementation and also at the end of the project to evaluate project indicators, outputs and accomplishments and to provide feedback and future recommendations through which programming can be improved.

A detailed longitudinal socio-economic survey will be performed each year of the project on 20-30 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 measure project impacts over the life of the project and after it has been completed. Relevant socio-economic indicators that have been included in the survey and will be monitored annually include:

- Demographic conditions
- Family employment, income and expenditure
- Education
- Living conditions, healthcare and "quality of life"
- Food and nutrition, food security
- Household responsibility distribution and gender equity
- Priorities for future development and training needs

In October 2002, during the initial stages of first year of the project, a detailed Agro-Ecological survey was performed of the local farming practices to evaluate potential ecological impacts and possible training interests of the community. The results of this assessment were analyzed, formally reported and incorporated into the development of the community through inclusion into the WCAEV Annual Workplan. The annual socio-

economic survey also includes a supplementary Agro-Ecological component intended to provide a comprehensive and quantitative annual assessment of the local farming methods, as well as to monitor the agricultural development of the communities. Some of the indicators that have been incorporated into the Agro-Ecological survey include:

- Land use
- Crop, vegetable, fruit, livestock production
- Seed sourcing
- Composting, bio-residue utilization
- Farm records and planning
  Indicators involving the "food footprint" of each household and a detailed energy analysis may also be included future surveys.

Dingxi County, Gansu Province, P.R.C.
Analysis of 2003 Results for Socio-Economic Survey

DINGXI Survey Administration

The WCAEV Socio-Economic survey was distributed June 7-18, 2003, to 21 households in Dingxi County, Gansu Province, P.R.C. An additional 5 households were surveyed in Dingxi from January 18-27, 2004, to ensure there was accurate representation of the local community.

- There were 26 households that participated in the 2003 survey with 125 individuals answering some or all of the questions
- Surveys were completed in the 4 villages within the Fuxing watershed that the project is being implemented in: Zhangjiachuan, Fengjiacha, Chankou and Beichuan.
- The same households will continue to participate in the survey every year until the end of the project in the long-term manner of a longitudinal study. Their individual answers will be statistically compared over the years in paired t-tests that will enable the determination of significant variance between years. The surveys from year 2003 will provide a baseline for comparison in the future. The 2003 survey will also be more detailed than in following years to provide a more comprehensive view of life in the watershed.
- The 26 typical farmer households sampled in Dingxi included households of average, below average and above average socio-economic status as determined by basic income and social standing. It is not detailed in this report what methodology was used to select households and how it was determined that they were "random" or representative samples.
- The sample of 26 households is not intended to be statistically representative of the entire watershed or direct project beneficiary group (325 households). Rather, the survey is intended to portray a strategic and more detailed view of the conditions of which some inhabitants of the watershed with a widely distributed socio-economic status may experience.

DINGXI DEMOGRAPHIC CHARACTERISTICS

Question 1: Please fill in the following chart for all household members including name; age; gender; Relationship to one another; Marital Status and Ethnic/Religious background:

This question was intended to provide basic tracking information on the sample populations so that individuals may be compared longitudinally over time. These

demographic characteristics can also assist in understanding the basic dynamics of family structure, household composition, ethnicity and human resources in the watershed.

- It was found there were 64 males and 64 females interviewed.
- Of the 26 households interviewed, the average household size was 4.85. Only one household questioned had 2 members, three households had 8 members, with the rest having 3-6.
- The average age of participants answering this question was 32. The average age of all males answering this question was 33, with females being 30. Of 125 individuals sampled, 97 (78%) were above 16 years in age or older, thereby generally able to work unless occupied in higher schooling.
- Generally, only nuclear families were sampled, with father, mother and children. More irregular or marginalized families could be sampled in the future, along with families that have younger children, families with no children, bachelors or females as the heads of the household.

DINGXI FAMILY EMPLOYMENT, INCOME AND EXPENDITURE

Question 2: What is the amount of your total yearly family income (RMB)?

This question was intended to provide information on the income levels of the sample populations as an indication of poverty and wealth in the watershed.

- Average annual household income of respondents was found to be ￥**8112** /yr (~$1600 CDN/yr with an approximate exchange rate of 5￥:$1CDN), with a median value of ￥7365 indicating half of the values are higher than the ￥7365, and half are below ￥7365 (*The median is a more robust measure of central tendency. Changing a single value won't change the median very much. In contrast, the value of the mean can be strongly affected by a single value that is very low or very high*).
- The lowest annual income value reported in Dingxi was 3,300 ￥/yr, while the highest was 15,480 ￥/yr. Standard deviation of the mean was 3005￥**.**
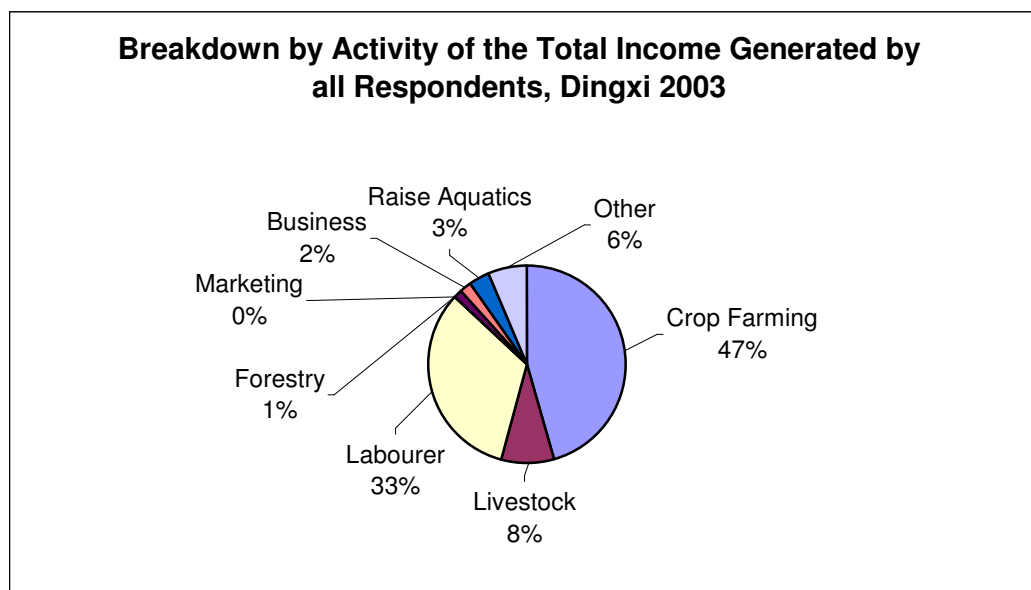
Question 3; What are your primary income generating activities? How much does each activity generate per year? (RMB)

This question was intended to provide information on employment levels and income sources in the watershed, as well as to provide information on the gender division of labour. Both the number of farmers (and gender) practicing each activity was counted along with the average income associated with that activity if practiced, as well as the cumulative sum of income for all respondents.

It was found that farming is practiced by more than half of the respondents, followed by labor, livestock and forestry. Overall in the sample, the primary income generating

activity was farming, followed by labor. By activity, business and raising aquatics were the most promising activities with the highest average incomes, followed by labour.

Annual Income Generating Activities and Household Participants by Gender					Amount (¥)		
Activity	Percent of farmers practicing activity	Number of farmers practicing activity	Number of men practicing	Number of women practicing	Sum of Annual Earnings (see chart below)	Average Annual Earnings	*Standard Deviation*
Farming	**53%**	51	23	28	**97,291**	1908	*1042*
Labourer	**21%**	26	23	3	**70,200**	**2700**	*1226*
Livestock	16%	19	4	15	18,030	1061	*657*
Forestry	12%	15	7	8	3150	210	*362*
Other	9%	11	9	2	13,397	1218	*1574*
Raise Aquatics	2%	2	1	1	7257	**3629**	*1996*
Business	1%	1	0	1	4000	**4000**	*N/A*

Breakdown by Activity of the Total Income Generated by all Respondents, Dingxi 2003

Raise Aquatics 3%
Business 2%
Marketing 0%
Forestry 1%
Labourer 33%
Livestock 8%
Crop Farming 47%
Other 6%

Question 4: Of these income generating activities, which is on your farm (1), in the village (2), in a neighboring town (3) or in another location (4)?

This question was intended to provide additional information on income sources and employment location as an indication of labour-based migration out of the watershed. Both the average and the mode were compared with similar results:

- Agriculture is generally done on the farmland of the farmer.
- Livestock raising is usually done on the farm or somewhere in the local village.

- Labour for income is almost always done in another location from the village, generally farther than the neighbouring towns.
- Forestry for income is usually practiced on the farm or somewhere in the local village.
- Business usually takes place in the village of the farmer.
- Other income generating activities are generally done in neighboring towns but can occur at a variety of places from in the local village to other, farther locations.

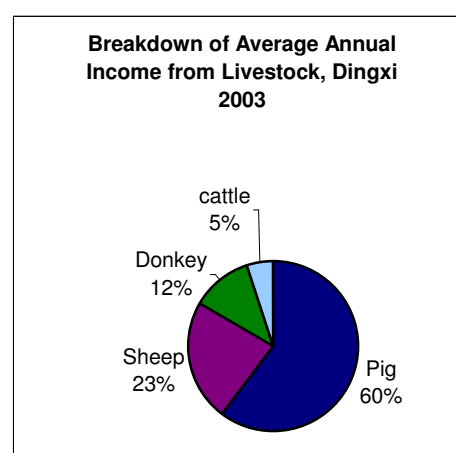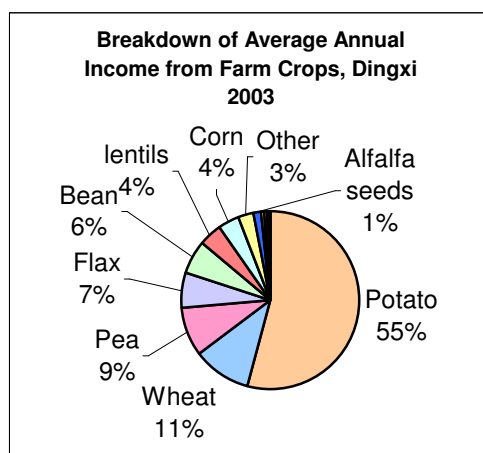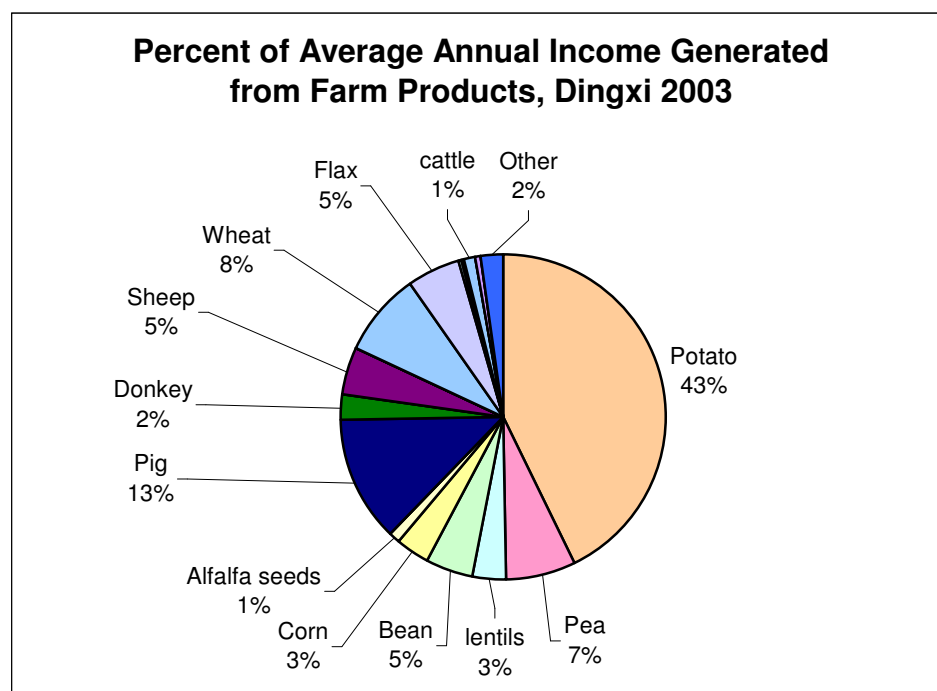| Location for income generation	Average	Mode
Agriculture	1.2	1
Livestock	1.9	2
Laborer	3.6	4
Forestry	1.7	2
Business	2.0	2
Other	3.0	4

Question 5: Of farm-generated income, what are your major products and how much income do you generate from each every year?   How much do you sell them for and where do you sell them?

This question was intended to provide additional information on income sources; both the average and the total survey sum for all participants in the household were determined. The results from the survey indicate that many cash crops are commonly produced in the farming communities. Please refer to question 35 for the land amounts associated with these crops. The major income generator in Dingxi appears to be potato with the remainder as follows from highest income to least:

Farm Product	Average Annual Earnings (￥) (see chart below)	Sum of Annual Earnings (￥)	Standard Deviation of the sum (￥)
Potato	1963	41540	2897
Pig	578	14460	339
Wheat	375	9380	78
Pea	319	6400	369
Flax	238	5940	-
Sheep	223	5580	153
Bean	222	5090	278
Lentils	147	3470	583
Corn	141	3380	208
Donkey	112	2810	312
Other	104	2600	-
Alfalfa seeds	51	1280	370
Cattle	48	1200	-
Oat	18	440	-
Millet	17	430	-

Grain	12	*310*	-
Sorghum	4	*110*	-
Vegetable seed	3	*80*	-
Chicken	2	*50*	-
Sum of Average Annual Farm Earnings	**4579**		

Percent of Average Annual Income Generated from Farm Products, Dingxi 2003

Breakdown of Average Annual Income from Farm Crops, Dingxi 2003

Breakdown of Average Annual Income from Livestock, Dingxi 2003

Question 6: How much time do family members spend working per week?

This question was intended to provide information on the time spent working as an indication of employment and quality of life.

The average farmer in the Dingxi survey spends 65 hours *(std. dev.12)* working per week, with men working an average of 64 hours *(std. dev.6)* a week and women working 67 *(std. dev.3)*. The highest amount of average hours worked reported per week was 103.

Question 7: How much free time per week do family members usually have during the busy and the slack farming seasons? What activities do you do?

This question was intended to provide information on the amount of free time available as an indication of the average quality of life.

The average farmer in the Dingxi survey has 94 hours *(std. dev.33)* of free time per week, with men *(std. dev.14)* and women *(std. dev.25)* being equal. Men mostly spent their free hours resting, socializing, reading taking care of livestock, doing housework, smoking and drinking tea or alcohol, while the women spent most of their time doing housework, handiwork or knitting. Twenty-one farmers (81%) also reported that watching TV was their primary free time activity.
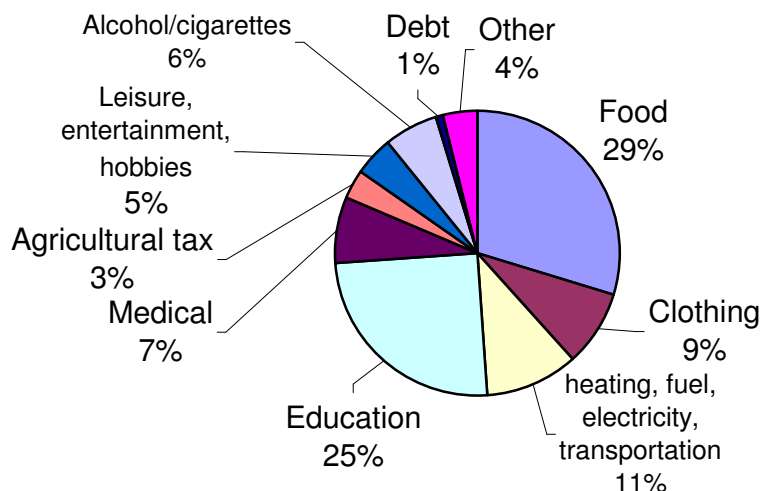
Question 8: What is the amount of your total yearly family expenditures (RMB)? And Question 9: How much do you spend on each item yearly (RMB)?

This question was intended to provide information on expenditures by household and farm as an indication of poverty and quality of life. Both the average and the median were compared with slightly differing results for average household expenditures:

- Average annual household expenditures were found to be **6249 □**, with a median value of 6098 indicating half of the values are higher than the 6098, and half are below 6098.
- The lowest annual expenditure value reported in Dingxi was 2273□/yr, while the highest was 10,840 □/yr. Standard deviation of the mean was 1899□.
- Farmers are spending a large amount of their income on food and education, with heating/fuel/transportation, medical and clothing also receiving moderate significance.
- Average annual farm expenditures were found to be **1595 □**. The primary purchase for farming households is seeds for planting.

Details of the Average Annual Household Expenditures (□) are as follows:

Breakdown by Percent of Average Annual Family Expenditures, Dingxi 2003

Alcohol/cigarettes 6%
Debt 1%
Other 4%
Food 29%
Leisure, entertainment, hobbies 5%
Agricultural tax 3%
Medical 7%
Clothing 9%
heating, fuel, electricity, transportation 11%
Education 25%

Household expenditures (per year)	Average Annual Expenditures (￥)	Sum of Annual Earnings (￥)	Standard Deviation (￥)
Sum of Total Yearly Expenditures	**5727**		
Food	1707	44379	1097
Education	1430	37180	3128
Heating, fuel, electricity, transportation	604	15710	265
Clothing	495	12860	295
Medical	418	10866	361
Alcohol/cigarettes	347	9010	334
Leisure, entertainment, hobbies	261	6778	200
Other	227	5232	242
Agricultural tax	200	5195	193
Debt	38	1000	196

Details of the Average Annual Farm Expenditures (￥) are as follows:

Breakdown by Percent of Average Annual Farm Expenditures, Dingxi, 2003
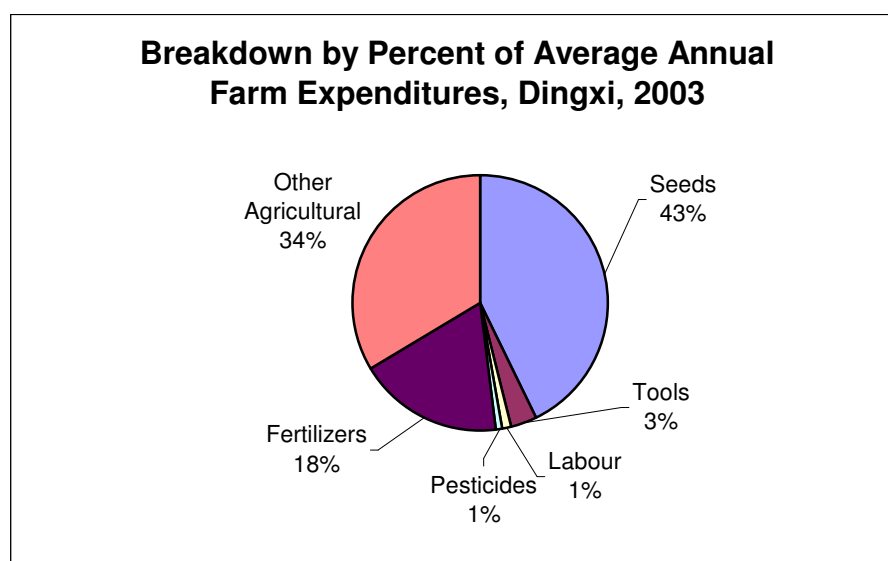
Farm Expenditures (per year)	Average Annual Farm Expenditures (￥)	*Sum of Annual Earnings (￥)*	*Standard deviation (￥)*
Sum of Total Farm Expenditures	**1595**		
Seeds	684	*17790*	*405*
Other Agricultural	535	*9625*	*1453*
Fertilizers	294	*7635*	*111*
Tools	53	*1380*	*47*
Labour	15	*400*	*54*
Pesticides	14	*365*	*14*

Question 10: How much money do you save every year (RMB)?

This question was intended to provide information on the net income of households as an indication of poverty and quality of life. Both the average and the median were compared with very different results:

The average amount of money saved per household surveyed is **589** ￥/year, with a median value of **0** ￥/year indicating at least half of the savings values are below 0. Standard deviation of this mean was 2040￥. An uneven distribution of savings was noted, with 22 households (58%) indicating they had zero savings (or did not answer the question) and only 4 households indicating they could save money (two answered 2000￥/year, one indicated 736￥/year and another indicated 10,000￥/year. It was probably this single high value that increased the mean so significantly, referring to the median value in this case would be a more accurate representation of the local situation.)

Question 12: Do you have credit? Please indicate how much (RMB) with each creditor?

This question was intended to provide information on the net income of households as an indication of poverty as well as to identify links and networks within and outside of the community:

Households surveyed reported an average amount of total debt of **1332** ▯ with 970 ▯*(std. dev.2745)* owed to family members 362 ▯*(std. dev.1052)* owed in credit to Banking Institutions. Only 9 households (35%) indicated they owed money to banking institutions, while 12 households (46%) indicated they owed money family members. As the majority of the sample did not have loans, it was likely that a handful of families with high loans raised the value of the average debt and created the large standard deviation. No loans were reported as owed to community associations or other institutions from the survey group.

Question 13: Who is in charge of the financial administration in the household?

This question was intended to provide information on decision-making and gender equality in the households.

It was noted that in 21 out of 26 households (81%) males are in charge of financial decisions. However, there were 4 households (15%) that indicated it was solely the women who were in charge, while one household indicated that the decisions were made jointly.

DINGXIEDUCATION

Question 14: Education of family members according to the following scale: No schooling (0); Attended Primary (1); Completed Primary (2); Attended High School (3); Completed High School (4); or higher education (5) and age when starting school?

This question was intended to provide information on education as an indication of social development and quality of life. The educational levels were regarded as continuous variables (as opposed to intervals) and averaged to find the typical amount of schooling for both men and women.

- On average, men surveyed reported that they had completed primary school/attended high school (average scale value of 2.3) and that they began schooling at 8 years of age.
- On average, women surveyed reported that they had completed primary school (average scale value of 2.0) and most began schooling at 8 years of age.

Question 15: If schooling is incomplete, what is the reason? (specify name of individual, age and gender)

This question was intended to provide information on education as an indication of social development, community capacity, overall quality of life and gender equality.

Eighty-six respondents (69%) answered that they did not finish schooling. The reasons for this illustrated in the chart below:

Breakdown of Reasons for incomplete schooling, Dingxi 2003

- Difficulty in studying 13%
- Other 1%
- Men superior to women 1%
- Family short of money 47%
- Family short of help/labour 38%
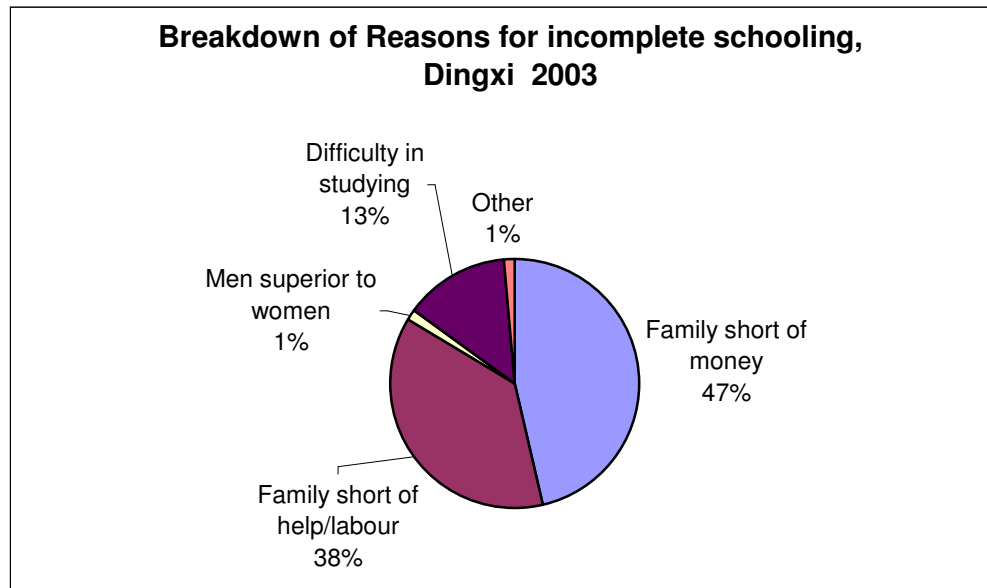
DINGXI LIVING CONDITIONS

Question 16: What household equipment/appliances/facilities do you have?

This question was intended to provide information on the amount of 'timesaving' or 'luxury' household items possessed by average households as an indication of quality of life. Notably, most households have TV's, toilets and sewing machines. These and other items are ranked according to frequency in homes in the chart below:

Appliance	Households having appliance(%)
TV	**96%**
Toilet	**85%**
Sewing Machine	**81%**
Stereo	69%
Radio	69%
Washing machine	23%
VCR	15%

Refrigerator	4%
Other (repeat reading recorder)	4%

Question 17: What type of cooking appliances to you have? (Mark with an ✓ or if more than one, indicate % used)

This question was intended to provide information on the common cooking appliances used by households as an indication of quality of life and local energy consumption. Appliances were ranked according to frequency in households and how often they were used (as % of total overall time cooking) in the chart below.

All respondents (26) answered the question probing what types of cooking appliances they had in their homes. Crop residue stoves were highlighted as the most often used appliance being used 43% of the time. Also notable was that most households owned crop residue, coal and solar cooking appliances. No households surveyed (0%) indicated they used biogas for cooking. Those respondents that answered 'other" did not specify what other materials they were using for cooking.

Cooking appliance in the home	How often appliance is used (% of total time)	% of households having appliance	Standard Deviation (%)
Crop residue	**43**%	**92%**	20%
Coal	33%	**92%**	20%
Solar oven	19%	**85%**	12%
Wood	4%	38%	5%
Others	1%	8%	3%
Bio-gas	0%	0%	0%

Question 18: How do you heat your home? (Mark with an ✓ or if more than one, indicate % used)

This question was intended to provide information on the common cooking fuels used by households as an indication of local energy consumption. It was determined that for heating, most households used much coal more than any other fuel. Fuels were ranked according to how often they were used (as % of total overall time cooking) in the chart below:

Fuel	How often fuel is used (% of total time)	Standard Deviation (%)
Coal	**69%**	23%
Crop residue	17%	17%
Livestock manure	9%	13%
Other	5%	11%

Wood	0%	*2%*

Question 19: Is your water safe to drink? (yes or no)

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health.

It was found that 21 households (81%) surveyed perceive that their water is safe to drink.

Question 20: What is your source of water?

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health. It was found that almost all households collect water from limited sources such as storage tanks that may only be renewed annually by rainwater during the rainy season. The breakdown of sources available is reported below:

Water source	Households using source (%)
Storage tank	**96**%
Hand Pump	12%
Other (fountain)	12%
Well	4%
Pipe borne	0%

Question 21: How do you store your water?

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health. It was found that almost all households only have access to basic storage facilities consisting of clay barrels, jars or pots. The breakdown of water storage methods is reported below:

Water storage method	Households using source (%)
Clay barrel, jar or pot	**85**%
Bucket or tin pail	50%
Tank	15%
Piped water	4%

Question 22: What is your family's most common form of personal and goods transport?

This question was intended to provide information on the common transportation methods used by households as an indication of quality of life and potential for market

expansion. It was found that most households use push bicycles for personal transport and transport of goods. People also often used 3 wheel trucks for the transport of goods.

The breakdown of the most common form of **personal** transportation was reported as below:

Personal Transportation	Households using transportation (%)
Push Bicycle	**92**%
3 wheel truck	15%
Motor cycle	12%
Drawn cart	8%
Other	4%
Automobile	0%
Public Transport	0%

The breakdown of the most common form of **goods** transportation was reported as below:

Goods Transport	Households using transport (%)
Push Bicycle	**85%**
3 wheel truck	**58%**
Drawn cart	4%
4 Wheel truck	4%

DINGXI FOOD AND NUTRITION

Question 23: Do you have any seasonal food security problems? If yes, which months do you experience this?

This question was intended to provide information on food security perception in the community as an indication of quality of life. Only one household surveyed (4%) indicated they experience seasonal food security issues, pinpointing August to September as the most difficult months.

Question 24: What kind of foods does your family eat? (Please mark never, sometimes or often with an "✓"according to your frequency) Do you purchase the food or produce it yourself? (Indicate % purchased)

This question was intended to provide information on household nutrition, diversity of diet and food production in the watershed as indications of health and self-sufficiency. Foods were identified as either eaten never, sometimes or often and local farm production was also identified.

It was found that the main staples of the diet in the communities are wheat, potatoes and meat. Also eaten on a regular basis are vegetables and fruits, eggs, beans and fish. The breakdown of the most common foods that families surveyed eat is as follows:

Common Household Foods Eaten	% of households that eat item "often"	% of households that eat item "sometimes"
Wheat	**92**%	0%
Potato	**85**%	8%
Meat	**58**%	38%
Beans	42%	**42**%
Vegetables	31%	**50**%
Eggs	27%	**69**%
Rice	23%	54%
Fruit	15%	**69**%
Dairy	4%	23%
Fish	0%	**58**%
Maize	0%	38%
Other	0%	4%

It was found that most rice, fish and vegetables are purchased as well as all dairy and corn. Most households consumed almost all of the items identified in the survey except for corn and dairy products. This indicates that families predominantly subsist on their own food resources rather than purchased items. The breakdown of the most common foods and the proportions they are **purchased** in is as follows:

Purchased Item	% of people that eat item who must purchase it	% of households that consume item
Rice	**95**%	**96**%
Fish	**76**%	**96**%
Vegetables	**74**%	**92**%
Wheat	45%	**92**%
Fruit	42%	**85**%
Meat	11%	**85**%
Beans	10%	**81**%
Potato	0%	**77**%
Eggs	0%	58%
Dairy	**100**%	38%
Maize	**100**%	27%

Question 25: What percentage of your total diet do you think you are producing on the farm?

This question was intended to provide information on food security in the watershed as an indication of self-sufficiency. On average, households surveyed indicated that they produce 88% *(std.dev.9)* of their total diet on their own farms.

Question 26: Which foods would you like to grow more of in the future?

This question was intended to provide information on interest in food and farm diversification in the watershed as an indication improved health, environment and self-reliance. It was found that farmers were most interested in livestock production including sheep and cattle. The breakdown of the interest found in households surveyed is portrayed in the chart below, listed from greatest to least interest in growing that product in the future:

Product	% of farmers interested in this product
Improved sheep	**58**%
Cow	**23**%
Vegetable	15%
Potato	15%
Herb Medicine	15%
Pig	8%
Pigeon for meat	8%
Donkey	8%
Goat	4%
Livestock	4%
Flax - edible oil	4%

Question 27: How could you improve your family's nutrition?

This question was intended to provide information on the understanding of the importance of household nutrition and diversity of diet in the watershed (separate from food production and related income) as an indication of health and education. Families believed that vegetables were considerably the best method to improve family nutrition, followed by chicken and fruit. Some also mentioned organic and green food as important for family nutrition. The percentage of households that feel that they can improve their nutrition by including certain products in their diet is portrayed in the chart below:

Item for consumption	% of farmers that believe item can improve family health

Vegetables	**77**%
Chicken	**38**%
Fruit	**35**%
Organic food or 'Green food"	**23**%
Pig	15%
Meat	12%
Sheep	12%
Egg	8%
Cattle	4%
Aquatics	4%
Potato	4%
*New seed varieties	4%

DINGXIHEALTH

Question 28: What types of illness is your family affected by? How often?

This question was intended to provide information on illnesses suffered in the households as an indication of quality of life and overall health. Families surveyed suffer from the following illnesses:

- Flu 23%
- Stomach pain 4%
- Cough 4%

Question 29: What type of health facilities are available in your community?

This question was intended to provide information on the availability of health care in the communities as an indication of quality of life and overall health.

- Fifty percent (50%) of households surveyed indicated they had access to private local health practitioners
- Thirty five percent (35%) of households surveyed indicated they had access to private western and local medical practitioners
- Twelve percent (12%) of households surveyed indicated they had access local hospitals
- Four percent (4%) of respondents indicated they had access to village herbalists or utilized self-treatment

DINGXIRESPONSIBILITIES

Question 30: Who is responsible for making decisions in the household?

This question was intended to provide information on decision-making and gender equality in the households

- Eighty-five percent (85%) of households surveyed indicated that men were responsible for decision making in the household
- Ten percent (10%) of households surveyed indicated that women were responsible for decision making in the household
- Five percent (5%) of households surveyed indicated that joint decision making took place in the household

Question 31: Please name the people in your house responsible for the following:

This question was intended to provide information on responsibility distribution and gender equality in the households. It was found that women were generally responsible for cooking, washing, cleaning, laundry, weeding and the care of others while men were generally responsible for plowing, planting, seeding and the provision of household fuels for cooking and heating. Most households also agreed that both women and men were responsible for livestock rearing and harvesting. The breakdown of responsibility for common household activities by gender is as follows:

Household / Farm tasks	% "Women" responsible	% "Men" responsible	% "Both" responsible
Cooking	**92**	0	8
Washing	**88**	8	4
Cleaning	**85**	4	12
Laundry	**73**	8	19
Weeding	**60**	12	28
Care of young/old	**46**	15	38
Collecting fuel for cooking/heating	30	**70**	0
Plowing	23	**65**	12
Planting/seeding	4	**65**	31
Livestock rearing	9	26	**65**
Harvesting	8	8	**85**

DINGXI OVERALL PERCEPTION

Question 32: If you had more income, how would you prioritize your spending? (Rank 1 as first to 5 as last)

This question was intended to provide information on the perception of priorities for development by the communities to ensure the project is adequately addressing local needs. It was found that education was the first and foremost priority for spending by the respondents. If households had more income, the breakdown on how respondents would prioritize their spending is, on average, as follows (ranked 1-5 with 1 being the most important):

Priority	Rank
Education	**1.6**
Housing	3.1
Clothing	3.3
Other*	3.7
Food	4.3
Medical	4.8

Priorities in the "other" category include livestock, leisure and sons marriage.

Question 33: What is your general degree of satisfaction in life?

This question was intended to provide information on the degree of satisfaction respondents felt regarding various aspects of their lives according to the following scale

1. very unsatisfied
2. unsatisfied
3. satisfactory
4. satisfied
5. Very satisfied

The results are an indication of overall perceptions on quality of life and to identify priorities for development. On average, household ranking of satisfaction is as follows:

Category	Numerical Ranking	Translated Ranking
Transportation	2.52	Unsatisfactory
Clothing	3.1	Slightly above satisfactory
Housing	3.23	Slightly above satisfactory
Environment/surroundings	3.23	Slightly above satisfactory
Diet	3.24	Slightly above satisfactory
Farming Sustainability	3.38	Slightly above satisfactory
Health Care	3.44	Slightly above satisfactory
Education	3.52	Slightly above satisfactory
Overall quality of life	**2.96**	**Slightly below satisfactory**

DINGXI Agro-ecological Assessment of Farming Systems

Question 34: What is the total land area that your household farms (mu)?

This question was intended to provide information on the agricultural resources of the sample populations as an indication of poverty, wealth and its distribution in the watershed.

- Average total farm area of respondents was found to be 27.3 mu *(std.dev.9)* with a median value of 30 mu, just under two hectares *(One hectare is equivalent to 15 mu)*.
- The largest land holding reported in Dingxi was 42 mu (2.8 ha), while the smallest was just 10 mu (0.67 ha).

Question 35: What field crops do you grow and how much area for each on your farm (mu)?

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that the primary crop (by amount of land) was significantly potato, with wheat and pea as the second most common crops. The average amount of land dedicated to each crop (mu) indicated by respondents is listed in the following chart:

Crop	Average amount of land (mu)	Standard Deviation
Potato	**5.20**	2.08
Wheat	**3.02**	3.64
Pea	**2.90**	2.27
Alfalfa	2.08	5.89
Flax - edible oil	1.44	1.45
Lentils	1.05	1.45
corn	0.72	1.12
Bean	0.54	1.33
Sorghum	0.48	0.87
Grain	0.46	0.95
Oat	0.44	0.88
Forest	0.35	1.77
Millet	0.25	0.61
Herb Medicine	0.15	0.61
Grass	0.05	0.24

Question 36: What vegetables and fruit crops do you produce on your farm? (mu)

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that the primary fruit crop (by amount of land) was significantly fruit trees. The average amount of land dedicated to fruits (mu) indicated by respondents is listed in the following chart:

Fruit	Average amount of land (mu)	*Standard Deviation*
Fruit trees	0.12	*0.29*
Radish	0.07	*0.22*
Pear	0.05	*0.14*
Chinese onion	0.05	*0.25*
Watermelon	0.02	*0.1*
Vegetables	0.02	*0.1*
Leek	0.02	*0.1*
Apricots	0.01	*0.06*
Cabbage	0.01	*0.06*

Question 37: Do you have in hay crops and pasture on your farm? What is the area (mu)?

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that on average farmers had 7 mu dedicated to permanent pastureland and a small amount dedicated to producing hay. The average amount of land dedicated to hay crops and pasture on farms (mu) indicated by respondents is as follows:

- Permanent Pasture 7.73 mu *(std.dev.7.6)*
- Hay 1.24 mu *(std.dev.1.35)*
- Improved Pasture 0.02 mu *(std.dev.0.1)*
  19 (73%) of farmers surveyed indicated they had no improved pasture land (or did not answer the question).

Question 38: Which of these practices do you employ on your farm? When did you implement them? Have you increased usage since you started? Would you like to further increase your usage or obtain more information on these subjects?

This question was intended to provide information on the frequency of farmers that utilized sustainable agricultural practices on their farms as an indication of agricultural sustainability in the watershed. This question is also to address training and education needs within the communities. It was found that most farmers practiced tree planting, carbon and nitrogen cycling, perennial plants and livestock forage, improved seeds, composting, and contour farming. The following percentages for use of each specified practice is found in the chart below:

Practice	Number Practicing 2002	% Practicing 2002	Number Practicing 2003	% Practicing 2003
Planting trees on sloped lands	25	**96**	25	96
High carbon crops	24	**92**	24	92
N fixing crops	23	**88**	25	*96*
Perennial forage for livestock	23	**88**	25	*96*
Improved seed quality	22	**85**	25	*96*
Composting manure	21	**81**	22	*85*
Perennial crops	21	**81**	23	*88*
Contour farming	21	**81**	21	81
Improved crop rotation	20	77	23	*88*
Increased Crop Diversity	19	73	24	*92*
Windbreaks	19	73	19	*73*
Increased crop varieties	18	69	21	*81*
Tillage across the slope	16	62	18	*69*
Reduced Chemical Fertilizer	12	46	25	*96*
Mixed/strip/inter-cropping	12	46	12	46
Reduced Herbicide	9	35	14	*54*
Reduced Tillage	8	31	13	*50*
Reduced Insecticide	7	27	11	*42*
Reduced livestock grazing	7	27	25	*96*
Reduced Fungicide	6	23	8	*31*
Check dams	5	19	5	19
Composting crop residues	2	8	7	*27*
Leaving residues on field	2	8	3	*12*
Green manure, cover cropping	2	8	5	*19*
Drip Irrigation	2	8	2	*8*
Soil testing	1	4	1	4
Irrigation	1	4	1	4

It was also found that there were increases in adoption rates from 2002 to 2003 for the following practices: nitrogen cycling, perennial plants and livestock forage, improved seeds, composting, crop rotation, crop diversity, windbreaks, increased varieties, tillage across the slope, reduced chemical fertilizer, tillage, insecticide and fungicide, reduced grazing, composting crop residues, leaving residues on field, green manure and drip irrigation.

Question 39: What types of livestock do you raise? (Indicate number of each) What are the main feeds you use to produce the livestock? Of these feeds, which do you purchase?

This question was intended to provide information on the livestock resources of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that on average, households had 4 chickens per household, with one pig, sheep and donkey. The breakdown of average number of animals per household is as below:

Animals	Average number of animals per household	Standard Deviation
Chickens	4.1	2.97
Pigs	1.6	0.94
Sheep	1.6	2.47
Donkeys	1.1	0.78
Goats	0.3	1.04
Cattle	0.1	0.6
Mules	0.1	0.33
Horses	0	0

Households with livestock were asked what they fed their animals. Cattle, sheep, pigs and donkeys were generally fed crop redidue, whild sheep, pigs and chickens were also commonly fed corn. The breakdown of animal feed by number of farmers providing said feed is as below:

Animal	% of Farmers owning animal that provide it with indicated feed								
	Crop residue*	Corn	Millet	Grain/ Oat	Potato	Bran	Alfalfa	Sorghum	Grass
Cattle	**100**	50	0	0	0	0	0	0	0
Sheep	**78**	**56**	0	0	0	0	33	0	11
Goats	0	0	0	0	0	0	0	0	0
Pigs	**60**	**44**	8	16	12	28	0	0	0
Chickens	30	**39**	17	13	4	30	0	0	0
Mules	**33**	33	0	0	0	0	0	0	0
Donkeys	**71**	5	5	19	0	5	5	5	5

The "crop residue" category includes straw, straw residue, wheat residue, flax residue and other crop residues.

Question 40: Name the field crop and vegetable seeds you currently attain from the following sources: Seed Stations; Private Breeders; Exchange with other farmers or Personal savings/collection

This question was intended to provide information on seed security in the watershed as an indication of self-sufficiency. It was found that seed stations provide most seeds for vegetables, corn and sorhgum while personal savings are responsible for the provision of lentil, oat, wheat, millet, bean, grain, flax, pea and potato seeds. The breakdown of where farming families source their seeds for major crops is as below:

Seed Type	Seed Stations	Private Breeders	Exchange with other farmers	Personal savings/collection	Number of farmers surveyed
Vegetables	**100**	-	-	-	2
Cabbage	**100**	-	-	-	1
Corn	**91**	-	-	9	22
Sorghum	**79**	21	-	-	14
Radish	50	-	-	50	2
Lentils	-	-	10	**90**	10
Oat	-	-	20	**80**	5
Wheat	13	-	17	**71**	24
Millet	-	-	33	**67**	3
Bean	-	-	33	**67**	3
Grain	-	33	-	**67**	3
Flax - edible oil	8	-	31	**62**	13
Pea	14	-	27	**59**	22
Potato	14	12	26	**48**	42

Question 41: What are the major reasons preventing you from developing the practices mentioned above? (Rank 1-important to 5-not important)

This question was intended to provide information on barriers to farm development in the watershed as an indication of self-sufficiency and development priorities. Households felt the major reason they were not developing the sustainable agricultural practices was that there was a lack of financial incentive, too great of a risk and a land of information and capital. The breakdown of perceptions on barriers to farm development is as follows (ranked 1-5 with 1 being the most important):

Reason	Rank	Standard Deviation
Lack of financial incentives	**2.7**	1.6
Too great of a risk	**3.0**	1.0
Lack of Information	**3.1**	1.3
Lack of capital	**3.3**	1.3
Might reduce income levels	3.9	1.6
Lack of farm labour	4.3	1.5
Not a high priority	4.8	0.8
Other	4.9	0.5

Question 42: What are your major sources of information for making decisions about management changes? (Mark with "✓")

This question was intended to provide information on information sources about management changes as an indication of education and community capacity building as well as to identify links and networks within and outside of the community. Households felt the major sources for information were training courses, farmers to farmer conversation and meetings and personal experience and observation. The breakdown of information sources available to farmers is as follows, listed from greatest to least:

Source of Information	% of farmers who indicate this source
Training courses	**88**%
Word of mouth from farmers	**85**%
Personal experience/observation	**85**%
Farm Meetings	**81**%
Government extension staff	65%
Printed information	50%
Company officials	50%

Question 43: Overall what are your biggest information/training needs?

This question was intended to provide information on the perception of priorities for agricultural development by the communities to ensure the project is adequately addressing local needs. Households felt their biggest needs for training and information are soil fertility, weed and pest and disease management and new crops, however many topics were indicated to be very important to the farmers. The breakdown of interest in training and information needs is as follows, listed from greatest to least:

Training/info need	% of farmers who indicate this need
Soil fertility Management	**96**%
Weed Management	**96**%
Pest and disease Management	**92**%
New crops	**92**%
Farm Planning	88%
Crop rotation planning	77%
Livestock production	77%
Soil erosion control	42%
Marketing	42%
Water impounding and irrigation	27%
Other	8%

Question 44: Which new crops, fruits or vegetables would you like to try on your farm?

This question was intended to provide information on interest in food and farm diversification in the watershed as an indication improved health, environment and self-reliance. It was found that farmers were most interested in vegetables and potatoes, however many products were indicated to be of interest to the farmers. The breakdown of the interest found in households surveyed is portrayed in the chart below, listed from greatest to least interest in growing that product in the future:

Crop, Fruit or Vegetable	% of interested farmers
Vegetables	**50**%
Potato	**46**%
Animal Fodder/grass	15%
Fruit trees	15%
Wheat	15%
Chinese Cabbage	12%
Onion	12%
Herb Medicine	8%
Pea	8%
Tomatoes	8%
Chinese onion	4%
Cucumber	4%
Flax - edible oil	4%
Garlic	4%
Grapes	4%
Green bean	4%
Millet	4%
Radish	4%

Zhunger County, Inner Mongolia Autonomous Region, P.R.C.

Analysis of 2003 Results for Socio-Economic Survey

ZHUNGER Survey Administration

The WCAEV Socio-Economic survey was distributed June 5-9, 2003, to 20 households in Zhunger county, Inner Mongolia, P.R.C.

- There were 20 households that participated in the 2003 survey with 73 individuals answering some or all of the questions.
- Surveys were completed in each of the groups that the project will be implemented in: Bainiliang, Aobouyen, Jiajiayaozi, Nalingou and Sujiata all contained in the Sujiata village in the Deshengxi watershed.
- The same households will continue to participate in the survey every year until the end of the project in the long-term manner of a longitudinal study. Their individual answers will be statistically compared over the years in paired t-tests that will enable the determination of significant variance between years. The surveys from year 2003 will provide a baseline for comparison in the future. The 2003 survey will also be more detailed than in following years to provide a more comprehensive view of life in the watershed.
- The 20 typical farmer households sampled in Zhunger included 10 households of average socio-economic status as determined by basic income and social standing, 5 above average and 5 below average. It is not detailed in this report what methodology was used to select households and how it was determined that they were "random" or representative samples.
- The sample size of 20 households is not intended to be statistically representative of the entire watershed or direct project beneficiary group (230 households). Rather, the survey is intended to portray a strategic and more detailed view of the conditions of which some inhabitants of the watershed with a widely distributed socio-economic status may experience.

ZHUNGER DEMOGRAPHIC CHARACTERISTICS

Question 1: Please fill in the following chart for all household members including name; age; gender; Relationship to one another; Marital Status and Ethnic/Religious background:

This question was intended to provide basic tracking information on the sample populations so that individuals may be compared longitudinally over time. These

demographic characteristics can also assist in understanding the basic dynamics of family structure, household composition, ethnicity and human resources in the watershed.

- It was found there were 47 males interviewed and 26 females. It was also found that within households, there were a disproportionate number of male to female children (4:1) within the family. This could be due to a number of factors including females getting married and leaving the household, thereby not being considered in the survey.
- Of the 20 households interviewed, the average household size was 3.65. Only one household questioned had 2 members, another one had 5, the rest having 3 or 4.
- The average age of participants answering this question was 35. There were a number of males (usually household heads) who did not answer this question due to difficulty in understanding the questionnaire format. The average age of males answering this question was 31, with females being 41. Of 73 individuals sampled, 68 (93%) were above 16 years in age or older, thereby generally able to work unless occupied in higher schooling.
- Only nuclear families were sampled, with father, mother and children. More irregular or marginalized families could be sampled in the future, along with families that have younger children, families with no children, bachelors or females as the heads of the household.
- It was found that 100 % of participants were of Han decent. Families of Mongolian origin, or others could have also been represented.

ZHUNGER FAMILY EMPLOYMENT, INCOME AND EXPENDITURE

Question 2: What is the amount of your total yearly family income (RMB)?

This question was intended to provide information on the income levels of the sample populations as an indication of poverty and wealth in the watershed.

- Average annual household income of respondents was found to be **4975** /yr (~$1000 CDN/yr), with a median value of 4650 indicating half of the values are higher than the 4650, and half are below 4650 (*The median is a more robust measure of central tendency. Changing a single value won't change the median very much. In contrast, the value of the mean can be strongly affected by a single value that is very low or very high*).
- The lowest annual income value reported in Zhunger was 1,400 /yr, while the highest was 8,800 /yr. Standard deviation of the mean was 2484 **.**
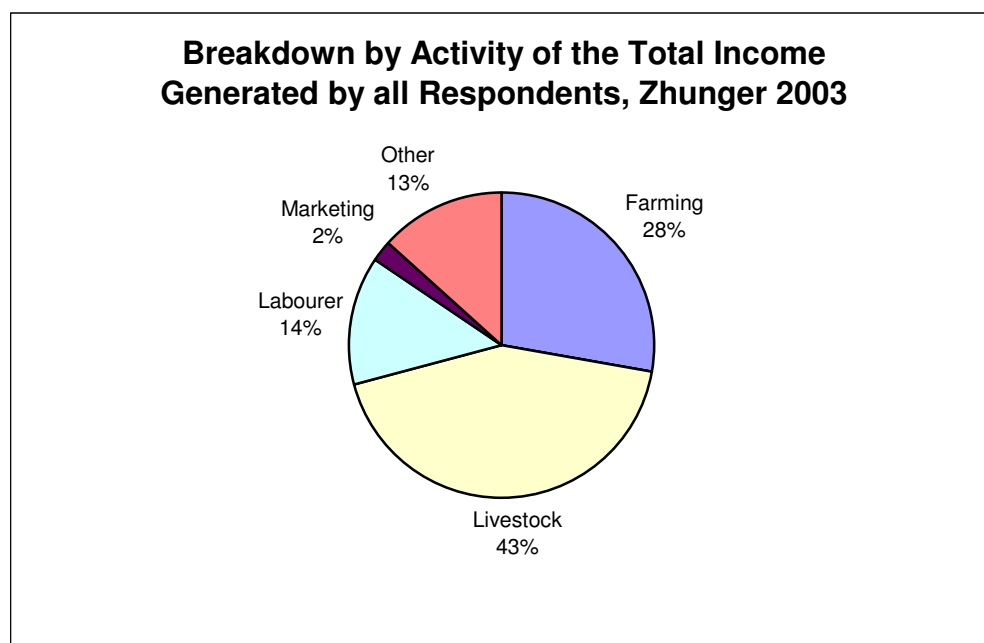
Question 3; What are your primary income generating activities? How much does each activity generate per year? (RMB)

This question was intended to provide information on employment levels and income sources in the watershed, as well as to provide information on the gender division of labour. Both the number of farmers (and gender) practicing each activity was counted

along with the average income associated with that activity if practiced, as well as the cumulative sum of income for all respondents.

It was found that livestock raising is practiced by almost half of the respondents, followed by farming as the second most common activity. Overall in the sample, the primary income generating activity was livestock raising, followed by farming. By activity, labour, marketing and other activities were the most promising activities with the highest average incomes.

Annual Income Generating Activities and Household Participants by Gender					Amount ()		
Activity	Number of farmers	Percent of farmers	Number of men	Number of women	Sum of Annual Earnings (see chart below)	Average Annual Earnings	*Standard deviation*
Livestock	**31**	49%	18	13	**43,200**	1394	*872*
Farming	**25**	40%	18	7	**27,900**	1116	*864*
Labourer	6	10%	5	1	13,600	**2267**	*1874*
Other	6	10%	2	4	13,500	**2250**	*1425*
Marketing	1	2%	1	0	2,100	2100	*N/A*

Breakdown by Activity of the Total Income Generated by all Respondents, Zhunger 2003

Other 13%
Marketing 2%
Labourer 14%
Farming 28%
Livestock 43%

Question 4: Of these income generating activities, which is on your farm (1), in the village (2), in a neighboring town (3) or in another location (4)?

This question was intended to provide additional information on income sources and employment location as an indication of labour-based migration out of the watershed. Both the average and the mode were compared with similar results:

- Agriculture is generally done on the farmland of the farmer.
- Livestock raising is usually done on the farm or somewhere in the local village.
- Labour for income is almost always done in another location from the village, generally farther than the neighbouring towns.
- Marketing is usually done in the village of the farmer by local 'businessmen"
- Other income generating activities are done at a variety of places from in the local village, to neighboring towns, to other, farther locations.
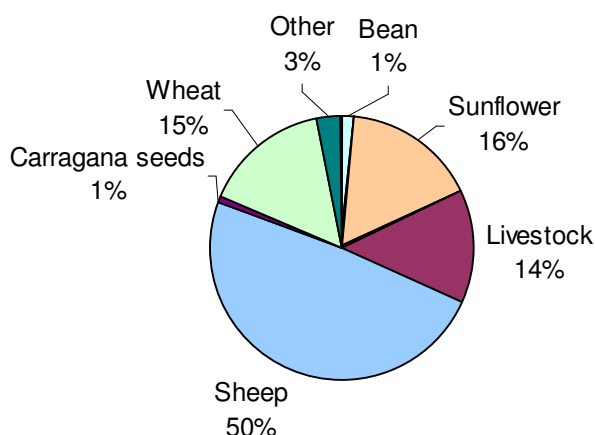
Location for income generation	Average	Mode
Agriculture	1.0	1
Livestock	1.6	2
Laborer	4.0	4
Marketing	2.0	2
Other	2.8	2

Question 5: Of farm-generated income, what are your major products and how much income do you generate from each every year?   How much do you sell them for and where do you sell them?
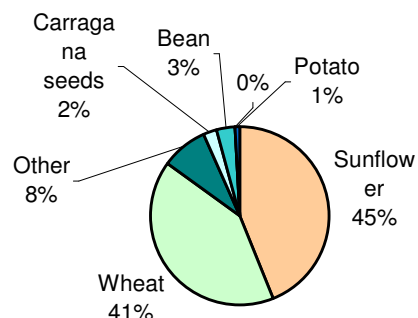
This question was intended to provide additional information on income sources; both the average and the total survey sum for all participants in the household were determined. The results from the survey indicate that many cash crops are commonly produced in the farming communities. Please refer to question 35 for the land amounts associated with these crops. The major income generator in Zhunger appears to be sheep and livestock, with sunflower and wheat as the highest income generators for agricultural crops. The bulk of these products were sold to local businessmen who then arranged their transfer to markets for sale. The most common agricultural products are ranked as follows from highest income earnings to least:

Farm Product	Average Annual Earnings (□) (see chart below)	Sum of Annual Earnings (□)	Standard Deviation of the sum (□)
Sheep (including sheep, wool and cashmere) and Goats	785	15,700	1069
Sunflower	265	5,300	526
Wheat	250	5,000	1118
Livestock	225	4,500	1006
Other	50	1,000	224
Carragana seeds	15	300	67
Bean	20	400	62
Potato	5	100	22

Percent of Average Annual Income Generated from Farm Products, Zhunger 2003

- Other 3%
- Bean 1%
- Wheat 15%
- Sunflower 16%
- Carragana seeds 1%
- Livestock 14%
- Sheep 50%

Breakdown of Average Annual Income from Farm Crops, Dingxi 2003

- Carragana seeds 2%
- Bean 3%
- 0%
- Potato 1%
- Other 8%
- Sunflower 45%
- Wheat 41%

Breakdown of Average Annual Income from Livestock, Zhunger 2003
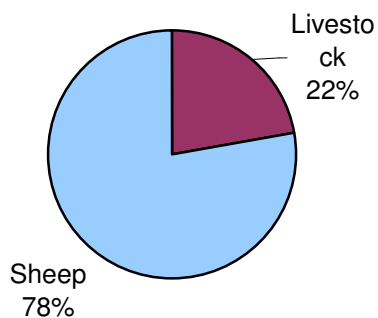
- Livestock 22%
- Sheep 78%

Question 6: How much time do family members spend working per week?

This question was intended to provide information on the time spent working as an indication of employment and quality of life.

The average farmer in the Zhunger survey spends 61 hours *(std. dev.14)* working per week, with men working an average of 62 hours *(std. dev.6)* a week and women working 59 *(std. Dev.11)*. The highest amount of average hours worked per week was 84.

Question 7: How much free time per week do family members usually have during the busy and the slack farming seasons? What activities do you do?

This question was intended to provide information on the amount of free time available as an indication of the average quality of life.

The average farmer in the Zhunger survey has 57 hours *(std. dev.5)* of free time per week, with men having an average of 55 hours *(std. dev.1) a* week and women having 58 *(std. dev.6)*. Men mostly spent their free hours taking care of livestock or doing housework, while the women spent most of their time doing housework. Some of the participants also mentioned they spent some of their free time training other farmers in the WCAEV farmer-to-farmer training program.

Question 8: What is the amount of your total yearly family expenditures (RMB)? And Question 9: How much do you spend on each item yearly (RMB)?

This question was intended to provide information on expenditures by household and farm as an indication of poverty and quality of life. Both the average and the median were compared with somewhat differing results for average household expenditures:

- Average annual household expenditures were found to be **6242 □**, with a median value of 4560 indicating half of the values are higher than the 4560, and half are below 4560. The median expenditure value is almost equal to the median income value of 4650□ (question 3), which indicates people may be having difficulties in saving money.
- The lowest annual expenditure value reported in Zhunger was 1600□/yr, while the highest was 20,100 □/yr (the next highest was 12,300). It was probably this single high value that increased the mean so significantly, referring to the median value in this case would be more accurate). Standard deviation of the mean was 4438□ indicating a high amount of variance within the sample.
- Farmers are spending a large amount of their income on education, with medical, debt, heating/fuel/transportation, and leisure/entertainment/hobbies also receiving moderate significance.
- Average annual farm expenditures were found to be **531□**. The primary purchase for farming households is fertilizer, distantly followed by seeds for planting.
- Also notable is that households are spending more on leisure, entertainment, hobbies, cigarettes and alcohol than on the total allocated to farm production.

Details of the Average Annual Household Expenditures (□) are as follows:

Average Annual Household Expenditures, Zhunger 2003
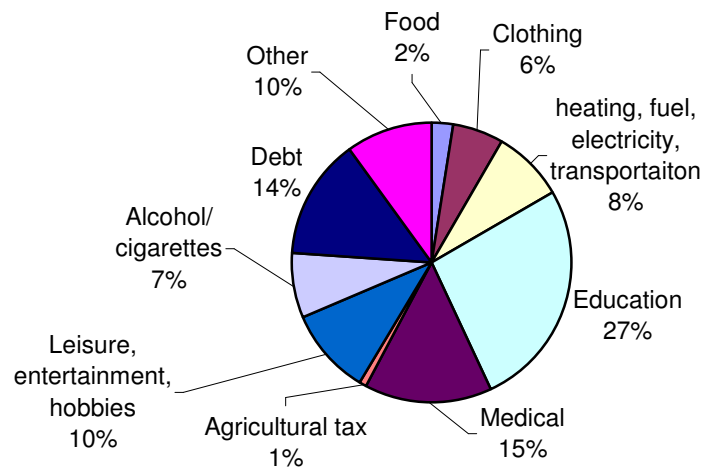
Household expenditures (per year)	Amount (￥)
Sum of Total Yearly Expenditures	**5771**
Education	1525
Medical	843
Debt	800
Other	579
Leisure, entertainment, hobbies	577
heating, fuel, electricity, transportation	478
Alcohol/cigarettes	432
Clothing	345
Food	141
Agricultural tax	52

Details of the Average Annual Farm Expenditures (￥) are as follows:

Average Yearly Farm Expenditures, Zhunger 2003
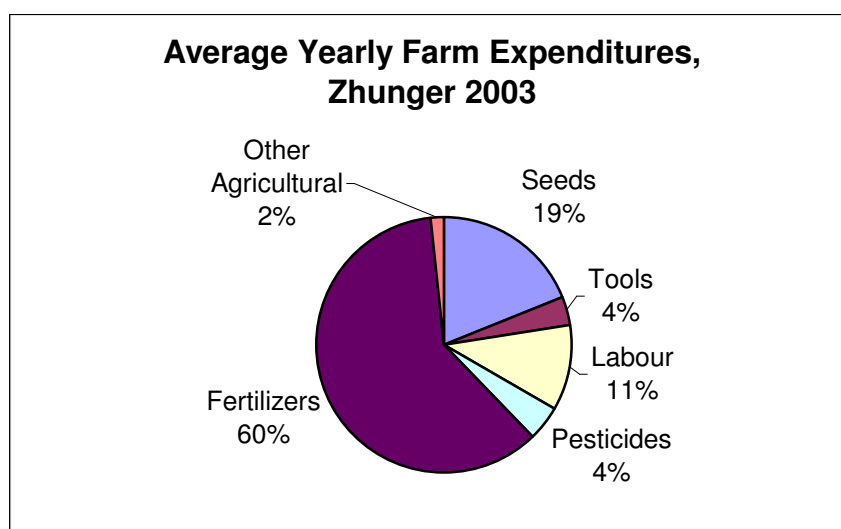
Farm Expenditures (per year)	Amount ()
Sum of Total Farm Expenditures	**531**
Fertilizers	321
Seeds	100
Labour	58
Pesticides	24
Tools	20
Other Agricultural	10

Question 10: How much money do you save every year (RMB)?

This question was intended to provide information on the net income of households as an indication of poverty and quality of life. Both the average and the median were compared with very different results:

The average amount of money saved per household surveyed is **620** /year, with a median value of **0** /year indicating at least half of the savings values are below 0. Standard deviation of this mean was 1121 . An uneven distribution of savings was noted, with 14 households (70%) indicating they had zero savings (or did not answer the question). It was probably these few high values that increased the mean so significantly, referring to the median value in this case would be a more accurate representation of the local situation.

Question 12: Do you have credit? Please indicate how much (RMB) with each creditor?

This question was intended to provide information on the net income of households as an indication of poverty as well as to identify links and networks within and outside of the community:

Households surveyed reported an average amount of total debt of **2850 ⃣** with 1050 ⃣ of that owed in credit to Banking Institutions, and 1800 ⃣ owed to family members. Only 7 households (35%) indicated they owed money to banking institutions, while another 7 households (35%) indicated they owed money family members. As the majority of the sample did not have loans, it was likely that a handful of families with high loans raised the value of the average debt and created the large standard deviation. No loans were reported from community associations or other institutions from the survey group.

Question 13: Who is in charge of the financial administration in the household?

This question was intended to provide information on decision-making and gender equality in the households.

It was noted that in 14 households (70%) males are in charge of the financial decisions. However, 5 out of 20 (25%) households indicated it was solely the women who were in charge, while one household indicated that the decisions were made jointly.

ZHUNGEREDUCATION

Question 14: Education of family members according to the following scale: No schooling (0); Attended Primary (1); Completed Primary (2); Attended High School (3); Completed High School (4); or higher education (5) and age when starting school?

This question was intended to provide information on education as an indication of social development and quality of life. The educational levels were regarded as continuous variables (as opposed to intervals) and averaged to find the typical amount of schooling for both men and women.

- On average, men surveyed reported that they had attended high school (average scale value of 2.4) and that they began schooling at 8 years of age.
- On average, women surveyed reported that they had attended or almost completed primary school (average scale value of 2.8) and most began schooling at 8 years of age.

Question 15: If schooling is incomplete, what is the reason? (specify name of individual, age and gender)

This question was intended to provide information on education as an indication of social development, community capacity, overall quality of life and gender equality.

- 60 respondents (82%) indicated that they did not finish schooling for the reasons represented in the chart below:

Reasons for incomplete schooling, Zhunger county 2003

Other
2%

Difficulty in studying
31%

Illness
3%

Men superior to women
2%

Family short of help/labour
10%

Family short of money
52%
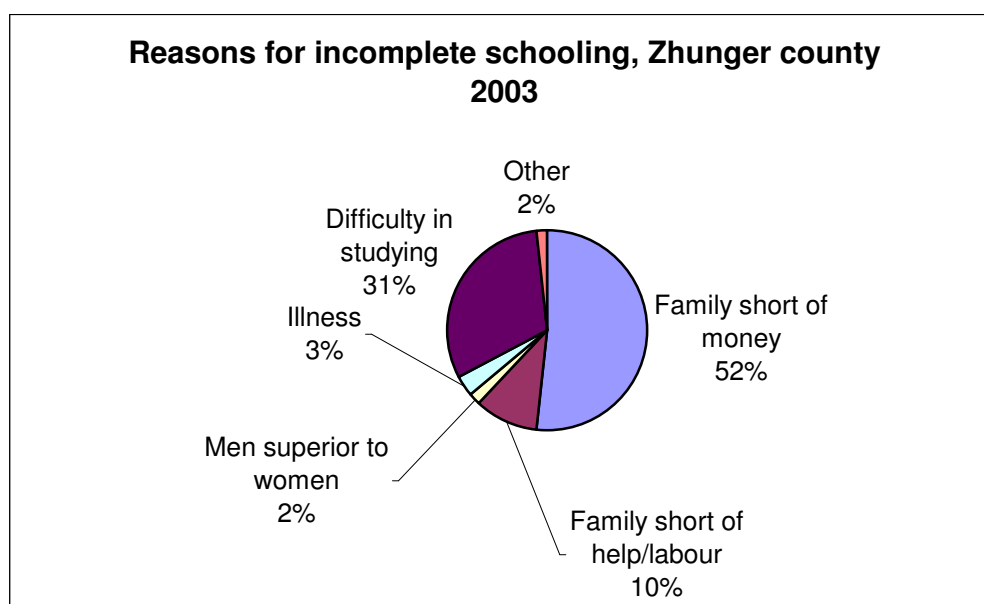
ZHUNGER LIVING CONDITIONS

Question 16: What household equipment/appliances/facilities do you have?

This question was intended to provide information on the amount of "timesaving" or "luxury" household items possessed by average households as an indication of quality of life. Notably, most households have TV's, sewing machines, and toilets. These and other items are ranked according to frequency in homes in the chart below:

Appliance	Percentage of households having appliance
TV	**95**%
Sewing Machine	**75**%
Toilet	**65**%
Stereo	55%
Radio	35%
Washing machine	10%
Refrigerator	10%
Other	10%
VCR	5%

Question 17: What type of cooking appliances to you have? (Mark with an ✓ or if more than one, indicate % used)

This question was intended to provide information on the common cooking appliances used by households as an indication of quality of life and local energy consumption.

Appliances were ranked according to frequency in households and how often they were used (as % of total overall time cooking) in the chart below.

Ninety percent of respondents (18) answered some or all of the questions probing what types of cooking appliances they had in their homes. Coal stoves were highlighted as the most often used appliance being used 81% of the time. Also notable was that most households owned coal cooking appliances, along with crop residue and wood combustion appliances. No households surveyed (0%) indicated they used biogas, solar ovens or "other appliances" for cooking. Also notable was that 90 % of households surveyed believed that they used a ratio of 10:10:80 Wood:Crop residue: coal to cook in their homes. One household felt they used 10:90 Wood: Coal, another felt they used 10:90 Crop residue: coal.

Cooking appliance in the home	How often appliance is used (% of total time)	% of households having appliance	Standard Deviation (%)
Coal	**81**%	**100**%	3%
Wood	9.5%	**95**%	2%
Crop residue	9.5%	**95**%	2%
Solar oven	0%	0%	0%
Bio-gas	0%	0%	0%

Question 18: How do you heat your home? (Mark with an ✓ or if more than one, indicate % used)

This question was intended to provide information on the common cooking fuels used by households as an indication of local energy consumption. It was determined that for heating, most households used coal much more than any other fuel. Fuels were ranked according to how often they were used (as % of total overall time cooking) in the chart below:

Fuel	How often fuel is used (% of total time)	Standard Deviation (%)
Coal	**100**%	0%
Crop residue	10.5%	0.3%
Wood	10.5%	0.3%
Other	0%	0%

Question 19: Is your water safe to drink? (yes or no)

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health.

It was found that 16 households (80%) surveyed perceive that their water is safe to drink

Question 20: What is your source of water?

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health. It was found that the majority of households collect water from limited sources such as wells or storage tanks that may only be renewed annually by rainwater during or after the rainy season. The breakdown of sources available is reported below:

Water source	Households using source (%)
Well	**75**%
Storage tank	5%
Storage tank and well	*20%*
Hand Pump	0%
Other	0%
Pipe borne	0%

Question 21: How do you store your water?

This question was intended to provide information on the quality of water available to households as an indication of quality of life and overall health. It was found that all households only have access to basic storage facilities consisting of clay barrels, jars or pots. The breakdown of water storage methods is reported below:

Water storage method	Households using source (%)
Clay barrel, jar or pot	**100**%
Bucket or tin pail	0%
Tank	0%
Piped water	0%

Question 22: What is your family's most common form of personal and goods transport?

This question was intended to provide information on the common transportation methods used by households as an indication of quality of life and potential for market expansion. It was found that most households use push bicycles and drawn carts for personal transport. The transport of goods is often done by drawn carts or 3-wheel trucks, followed by push bicycles.

The breakdown of the most common form of **personal** transportation was reported as below:

Personal Transportation	Households using transportation

	(%)
Push Bicycle	**60%**
Drawn cart	**55%**
3 wheel truck	**45%**
Motor cycle	5%
Automobile	0%
Public Transport	0%
Other	0%

The breakdown of the most common form of **goods** transportation was reported as below:

Goods Transport	Households using transport (%)
Drawn cart	**60**%
3 wheel truck	**55**%
Push Bicycle	35%
4 Wheel truck	10%
3 wheel truck	0%
Other	0%

ZHUNGER FOOD AND NUTRITION

Question 23: Do you have any seasonal food security problems? If yes, which months do you experience this?

This question was intended to provide information on food security perception in the community as an indication of quality of life. It was found that 100% of households surveyed indicated they did not experience any seasonal food security issues

Question 24: What kind of foods does your family eat? (Please mark never, sometimes or often with an "✓" according to your frequency) Do you purchase the food or produce it yourself? (Indicate % purchased)

This question was intended to provide information on household nutrition, diversity of diet and food production in the watershed as indications of health and self-sufficiency. Foods were identified as either eaten never, sometimes or often and local farm production was also identified.

It was found that the main staples of the diet in the communities are wheat and potatoes. Also eaten on a regular basis are rice, meat, vegetables and fruits, eggs, beans and fish. The breakdown of the most common foods that families surveyed eat is as follows:

Food the Household eats	% of households that eat item "often"	% of households that eat item "sometimes"
Potato	**100%**	0%
Wheat	**85%**	15%
Rice	45%	**55%**
Meat	40%	**55%**
Vegetables	35%	**60%**
Eggs	25%	**65%**
Fruit	20%	**75%**
Beans	15%	**85%**
Fish	0%	**85%**
dairy	0%	15%
Maize	5%	5%
Other	0%	0%

It was found that most rice, fish and vegetables are purchased as well as all dairy and corn. Most households consumed almost all of the items identified in the survey except for corn and dairy products. This indicates that families predominantly subsist on their own food resources rather than purchased items. The breakdown of the most common foods and the proportions they are **purchased** in is as follows:

Purchased Item	% of people that eat item who must purchase it	% of households that consume item
Rice	**95%**	**100%**
Fish	**76%**	**85%**
Vegetables	**74%**	**95%**
Wheat	45%	**100%**
Fruit	42%	**95%**
Meat	11%	**95%**
Beans	10%	**100%**
Potato	0%	**100%**
Eggs	0%	**90%**
Dairy	**100%**	15%
Maize	**100%**	10%

Question 25: What percentage of your total diet do you think you are producing on the farm?

This question was intended to provide information on food security in the watershed as an indication of self-sufficiency. On average, households surveyed indicated that they produce 70% *(std.dev.7.5)* of their total diet on their own farms.

Question 26: Which foods would you like to grow more of in the future?

This question was intended to provide information on interest in food and farm diversification in the watershed as an indication improved health, environment and self-reliance. It was found that farmers were most interested in producing corn (currently must purchase all of this) and improved sheep. Millet, potato and Chinese yam were also of interest. The breakdown of the interest found in households surveyed is portrayed in the chart below, listed from greatest to least interest in growing that product in the future:

Product	% of farmers interested in this product
Corn	**75**%
Improved sheep	**75**%
Millet	35%
Potato	25%
Chinese Yam	20%
Goat	15%
Green bean	10%
Fruit	10%
Cow	10%
Vegetable	5%
Grains	5%
Hay	5%
Sunflower	5%
Seed melon	5%
Pea	5%
Local grass	5%
Livestock	5%

Question 27: How could you improve your family's nutrition?

This question was intended to provide information on the understanding of the importance of household nutrition and diversity of diet in the watershed (separate from food production and related income) as an indication of health and education. Families believed that vegetables were considerably the best method to improve family nutrition, followed by beans and fruit. Some also mentioned eggs and peas as important for family nutrition. The percentage of households that feel that they can improve their nutrition by including certain products in their diet is portrayed in the chart below:

Item for consumption	% of farmers that believe item can improve family health
Vegetables	**70**%
Bean	**60**%
Fruit	**35**%
Egg	10%
Pea	5%

Question 28: What types of illness is your family affected by? How often?

This question was intended to provide information on illnesses suffered in the households as an indication of quality of life and overall health. Families surveyed suffer from the following illnesses:

- Flu 85%
- Stomach pain 10%
- Foot Problems 5%
- Stomach pain 5%
- High blood pressure 5%

Question 29: What type of health facilities are available in your community?

This question was intended to provide information on the availability of health care in the communities as an indication of quality of life and overall health.

- Forty percent (40%) of households surveyed indicated they had access to private local health practitioners only
- Sixty percent (60%) of households surveyed indicated they had access to both private local health practitioners and local hospitals
- No respondents indicated they had access to private western medical practitioners and specialists, or village herbalists.

ZHUNGER RESPONSIBILITIES

Question 30: Who is responsible for making decisions in the household?

This question was intended to provide information on decision-making and gender equality in the households

- Eighty percent (80%) of households surveyed indicated that men were responsible for decision making in the household
- Five percent (5%) of households surveyed indicated that women were responsible for decision making in the household
- Fifteen percent (15%) of households surveyed indicated that joint decision making took place in the household

Question 31: Please name the people in your house responsible for the following:

This question was intended to provide information on responsibility distribution and gender equality in the households. It was found that women were generally responsible for cooking, washing, laundry, cleaning and the care of others while men were generally responsible for plowing, planting, seeding and the provision of household fuels for cooking and heating. Most households also agreed that both women and men were responsible for livestock rearing, weeding and harvesting. The breakdown of responsibility for common household activities by gender is as follows:

Household / Farm tasks	% "Women" responsible	% "Men" responsible	% "Both" responsible
Cooking	**100**	0	0
Washing	**100**	0	0
Laundry	**100**	0	0
Cleaning	**84**	5	11
Care of young/old	**59**	12	29
Collecting fuel for cooking/heating	0	**100**	0
Plowing	0	**85**	15
Planting/seeding	0	**80**	20
Livestock rearing	5	15	**80**
Weeding	0	10	**90**
Harvesting	0	10	**90**

ZHUNGER OVERALL PERCEPTION

Question 32: If you had more income, how would you prioritize your spending? (Rank 1 as first to 5 as last)

This question was intended to provide information on the perception of priorities for development by the communities to ensure the project is adequately addressing local needs. It was found that housing was the first and foremost priority for spending by the respondents, followed by education and food. This indicates the inhabitants experience a more day-to-day existence with concerns about the provision of basic goods. If households had more income, the breakdown on how respondents would prioritize their spending is, on average, as follows (ranked 1-5 with 1 being the most important):

Priority	Rank
Housing	**2.1**
Education	2.4
Food	2.6
Clothing	3.7
Other*	4.4

Priorities in the "other" category include marriage, purchase of motorcycle, build sheep ranch etc.

Question 33: What is your general degree of satisfaction in life?

This question was intended to provide information on the degree of satisfaction respondents felt regarding various aspects of their lives according to the following scale

6. very unsatisfied
7. unsatisfied
8. satisfactory
9. satisfied
10. Very satisfied

The results are an indication of overall perceptions on quality of life and to identify priorities for development. On average, household ranking of satisfaction is as follows:

Category	Numerical Ranking	Translated Ranking
Diet	3.7	Satisfied
Transportation	3.35	Above satisfactory-satisfied
Farming Sustainability	3.25	Above satisfactory-satisfied
Clothing	3.05	Satisfactory
Housing	2.95	Slightly below satisfactory
Health Care	2.9	Slightly below satisfactory
Environment/surroundings	2.85	Slightly below satisfactory
Education	2.32	Unsatisfied
Overall quality of life	**2.95**	**Slightly below satisfactory**

ZHUNGER Agro-ecological Assessment of Farming Systems

Question 34: What is the total land area that your household farms (mu)?

This question was intended to provide information on the agricultural resources of the sample populations as an indication of poverty, wealth and its distribution in the watershed.

• Average total farm area of respondents was found to be 14.24 mu *(std.dev.6.1)*, with a median value of 14.25 mu, just under one hectare *(One hectare is equivalent to 15 mu).*
• The largest land holding reported in Zhunger was 26 mu (1.7 ha), while the smallest was just 5 mu (0.33 ha).

Question 35: What field crops do you grow and how much area for each on your farm (mu)?

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that the primary crops (by amount of land) were significantly corn and millet, with potato and sunflower as the second most common crops. The average amount of land dedicated to each crop (mu) indicated by respondents is listed in the following chart:

Crop	Average amount of land (mu)	Standard Deviation
Corn	**3.6**	2.3
Millet	**3.5**	2.6
Potato	**2.3**	1.5
Sunflower	**1.6**	2.1
Bean	0.6	1.0
Chinese Yam	0.5	1.3
Seed melon	0.5	1.6
Squash	0.4	1.1
Pea	0.3	1.1
Grain	0.2	0.4
Blackbean	0.2	0.5
Canola	0.2	0.7
Oat	0.1	0.5
Flax - edible oil	0.1	0.5
Soybean	0.1	0.2
Other	0.0	0.0

Question 36: What vegetables and fruit crops do you produce on your farm? (mu)

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that the primary fruit crop (by amount of land) was significantly apricots, followed by apple trees. The average amount of land dedicated to fruits (mu) indicated by respondents is listed in the following chart:

Fruit	Average amount of land (mu)	Standard Deviation
Apricots	**0.75**	1.59
Apple	**0.4**	0.94
Pear	0.11	0.45

Bean	0.07	*0.13*
Squash	0.07	*0.13*
Cucumber	0.06	*0.22*
Kidney Bean	0.03	*0.06*
Cabbage	0.02	*0.03*
Radish	0.02	*0.07*
Green pepper	0.02	*0.09*
Turnip	0.02	*0.07*
Tomatoes	0.01	*0.03*
Watermelon	0.01	*0.04*
Persimmons	0.0045	*0.01*
Vegetables	0.003	*0.01*

Question 37: Do you have in hay crops and pasture on your farm? What is the area (mu)?

This question was intended to provide information on the agricultural resources, productivity and product diversity of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that on average farmers had 12 mu dedicated to permanent pastureland, 15 to improved pasture and 16 mu dedicated to producing hay. The average amount of land dedicated to hay crops and pasture on farms (mu) indicated by respondents is as follows:

- Hay 16.2 mu
- Improved Pasture 14.7 mu.
  (*15% of farmers surveyed indicated they had no improved pasture land*)
- Permanent Pasture 11.7 mu.
  (*25% of farmers surveyed indicated they had no permanent pasture land*)

Question 38: Which of these practices do you employ on your farm? When did you implement them? Have you increased usage since you started? Would you like to further increase your usage or obtain more information on these subjects?

This question was intended to provide information on the frequency of farmers that utilized sustainable agricultural practices on their farms as an indication of agricultural sustainability in the watershed. This question is also to address training and education needs within the communities. It was found that most farmers practiced crop rotations, biological nitrogen cycling, composting, perennial plants for livestock forage and reduced livestock grazing. The following percentages for use of each specified practice is found in the chart below:

Practice	*Number Practicing 2002*	**% Practicing 2002**	*Number Practicing 2003*	**% Practicing 2003**
N fixing crops	*19*	**95**	*19*	95
Improved crop rotation	*17*	**85**	*19*	***95***

Composting manure	*17*	**85**	*17*	85
Perennial forage for livestock	*16*	**80**	*17*	*85*
Reduced livestock grazing	*14*	**70**	*19*	*95*
Planting trees on sloped lands	*13*	65	*14*	*70*
Reduced Fertilizer	*13*	65	*13*	65
Mixed/strip/inter-cropping	*12*	60	*13*	65
Tillage across the slope	*12*	60	*12*	60
High carbon crops	*12*	60	*12*	60
Improved seed quality	*6*	30	*12*	*60*
Crop Diversity	*5*	25	*11*	*55*
Perennial crops	*3*	15	*3*	15
Irrigation	*2*	10	*5*	*25*
Soil testing	*2*	10	*2*	10
Composting crop residues	*2*	10	*2*	10
Reduced Herbicide	*1*	5	*1*	5
Reduced Insecticide	*1*	5	*1*	5
Reduced Tillage	*1*	5	*1*	5
Leaving residues on field	*1*	5	*1*	5
Contour farming	*1*	5	*1*	5
Check dams	*1*	5	*1*	5
Increased crop varieties	*0*	0	*8*	*40*
Reduced Fungicide	*0*	0	*0*	0
Green manure, cover cropping	*0*	0	*0*	0
Windbreaks	*0*	0	*0*	0
Drip Irrigation	*0*	0	*0*	0

It was also found that there were increases in adoption rates from 2002 to 2003 for the following practices: improved crop rotation, perennial plants for livestock forage, reduced livestock grazing, planting trees on sloped land, improved seed quality, increased crop diversity, increased number of crop varieties and irrigation.

Question 39: What types of livestock do you raise? (Indicate number of each) What are the main feeds you use to produce the livestock? Of these feeds, which do you purchase?

This question was intended to provide information on the livestock resources of the sample populations as an indication of poverty and agricultural sustainability in the watershed. It was found that on average, households had 14 goats per household, with 5 sheep, 5n chickens and 2 pigs. The breakdown of average number of animals per household is as below:

Animals	Average number of animals per household	*Standard Deviation*
Goats	13.8	*12.62*
Sheep	5.2	*5.98*

Chickens	4.7	*3.87*
Pigs	1.6	*0.69*
Mules	0.4	*0.49*
Donkeys	0.4	*0.6*
Cattle	0	*0*
Horses	0	*0*

Households with livestock were asked what they fed their animals.

- 100% answered corn for all of their animals including: Goats, Sheep, Chickens, Pigs, Mules and Donkeys. Much of this corn is purchased but corn also makes up a large amount of farm produce and is rarely eaten by humans in the household.
- 2 Farmers indicated they fed their pigs with millet
- 2 indicated they fed their chickens with millet.
- One farmer gives beans to his goat.
- One farmer indicated his goat ate grass, another mentioned hay.

Question 40: Name the field crop and vegetable seeds you currently attain from the following sources: Seed Stations; Private Breeders; Exchange with other farmers or Personal savings/collection

This question was intended to provide information on seed security in the watershed as an indication of self-sufficiency. It was found that seed stations provide most seeds for corn, watermelon, kidney beans, cucumber, cabbage, tomato, radish, melon, squash and other vegetables, while personal savings are responsible for the provision of oat, beans, grains sunflower and Chinese yam. Farmers also often save their own millet seed or exchange it with other farmers. The breakdown of where farming families source their seeds for major crops is as below:

Seed Type	Seed Stations	Private Breeders	Exchange with other farmers	Personal savings/collection	*Number of farmers surveyed*
Corn	**86**	5	5	5	*21*
Watermelon	**100**	-	-	-	*6*
Millet	-	4	50	46	*26*
Potato	-	-	45	**55**	*11*
Oat	-	-	-	**100**	*1*
Bean	17	-	-	**83**	*6*
Grain	-	-	-	**100**	*3*
Chinese Yam	-	5	37	**58**	*19*
Sunflower	50	-	-	50	*2*
Kidney Bean	**100**	-	-	-	*1*
cucumber	**100**	-	-	-	*8*
Cabbage	**100**	-	-	-	*2*
Tomato	**100**	-	-	-	*3*
Radish	**100**	-	-	-	*2*
Melon	**100**	-	-	-	*2*

Squash	**100**	-	-	-	*2*
Vegetables	**100**	-	-	-	*2*

Question 41: What are the major reasons preventing you from developing the practices mentioned above?

This question was intended to provide information on barriers to farm development in the watershed as an indication of self-sufficiency and development priorities. Households felt the major reason they were not developing the sustainable agricultural practices was that there was a lack of information, capital and financial incentives. The breakdown of perceptions on barriers to farm development is as follows (ranked 1-5 with 1 being the most important):

Reason	% of farmers who indicate reason
Lack of Information	**100** %
Lack of capital	**95** %
Lack of financial incentives	**90** %
Might reduce income levels	85 %
Too great of a risk	65 %
Lack of farm labour	50 %
Other	5 %
Not a high priority	0 %

Question 42: What are your major sources of information for making decisions about management changes? (Mark with "✓")

This question was intended to provide information on information sources about management changes as an indication of education and community capacity building as well as to identify links and networks within and outside of the community. Households felt the major sources for information were government extension staff, personal experience and observation, printed information and training courses. Farmer to farmer exchanges and meetings are not evidenced as that important. The breakdown of information sources available to farmers is as follows, listed from greatest to least:

Source of Information	% of farmers who indicate this source
Government extension staff	**90** %
Personal experience/observation	**90** %
Printed information	**90** %
Training courses	**85** %
Word of mouth from farmers	65 %
Farm Meetings	20 %
Company officials	5 %

Question 43: Overall what are your biggest information/training needs?

This question was intended to provide information on the perception of priorities for agricultural development by the communities to ensure the project is adequately addressing local needs. Households felt their biggest needs for training and information are crop rotation management, farm planning and new crops, however many topics were indicated to be very important to the farmers. The breakdown of interest in training and information needs is as follows, listed from greatest to least:

Training/info need	% of farmers who indicate this need
Crop rotation planning	**95** %
Farm Planning	**95** %
New crops	**95** %
Livestock production	**90** %
Soil erosion control	**90** %
Soil fertility Management	**90** %
Pest and disease Management	**85** %
Weed Management	**85** %
Marketing	65 %
Water impounding and irrigation	65 %
Other	0 %

Question 44: Which new crops, fruits or vegetables would you like to try on your farm?

This question was intended to provide information on interest in food and farm diversification in the watershed as an indication improved health, environment and self-reliance. It was found that farmers were most interested in corn, grapes and cucumber, however many products were indicated to be of interest to the farmers. The breakdown of the interest found in households surveyed is portrayed in the chart below, listed from greatest to least interest in growing that product in the future:

Crop, Fruit or Vegetable	% of farmers who would like to try this
Corn	**70** %
Grapes	**70** %
Cucumber	**65** %
Apple	40 %
Millet	35 %
Tomatoes	30 %
Peach	25 %
Green grains	20 %
Pear	15 %
Persimmons	15 %

Potato	15 %
Bean	10 %
Date	10 %
Kidney Bean	10 %
Watermelon	10 %
Apricot	5 %
Chinese Yam	5 %
Eggplant	5 %
Green bean	5 %
Green Pepper	5 %
Squash	5 %