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Improving Nutrition, Food Safety and Food Security for China's Most Vulnerable Women and Children

ANALYSIS ON FOOD SECURITY AND VULNERABILITY IN SIX COUNTIES IN RURAL CHINA

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List of Acronyms

CAAS	Chinese Academy of Agricultural Sciences
CCDC	Chinese Centre for Disease Control and Prevention
CFSVA	Comprehensive Food Security and Vulnerability Analysis
DEFF	Design effect
FAO	Food and Agriculture Organization
FCG	Food consumption group
FCS	Food consumption score
IFAD	International Fund for Agricultural Development
MDG	Millennium Development Goal
NDKPCs	Nationally Defined Key Poverty Counties
NGO	Non-government organization
PCA	Principal component analysis
PPS	Probability proportional to size sampling
UNICEF	United Nations International Children's Emergency Fund
VAM	Vulnerability Analysis and Mapping
WFP	World Food Programme
WHO	World Health Organization
WI	Wealth index

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1 KEY FINDINGS

- The rates and causes of food insecurity vary widely across the six counties surveyed proving that there can be no one size fits all approach to improving food security and nutrition in rural China.

- Luonan has the highest prevalence of food insecurity (35%) followed by Zheng'an (19%) and Zhen'an (18%) while the other three counties have significantly fewer food insecure households.

- The counties' average per capita income is just over half the national average for rural households with Zhen'an and Luonan ranking the lowest, exemplifying the link between poverty and food insecurity.

- The six counties are predominantly rural with agriculture the main source of income for over half of households and 95% have access to land. But agricultural work is not always enough to ensure rural Chinese can provide enough food for their families. While the overall prevalence of food insecurity is not high, households in areas with poorer agricultural land are highly dependent on remittances to ensure food security.

- Many of the food insecure tend to be those that have failed to benefit from the rapid economic growth of the country i.e. the poor, the most burdened by ill health, the elderly, those relying on pensions, those with a high elderly dependency ratio and those without improved sanitation. Younger generations are wealthier with improved food security status.

- Household members with the skills and opportunities to migrate and send remittances home will do so rather than struggle to find work and support families with unsustainable agricultural work and unskilled labour. A fifth of the population migrates and a third of households receive remittances. The percentage of migrants is highest in Luonan where about 50% benefit from remittances. Households that receive remittances are generally more food secure.

- A lack of skills/adult training also plays a part in food insecurity. 14% of unskilled labourers are food insecure with the figure as high as 43% in Luonan.

- Medical expenses weigh heavily on these rural households and in many cases contribute to food insecurity. Panxian is the wealthiest of the six counties in terms of per capita income, but medical expenses are high, seemingly because of illnesses or injuries relating to the dominant mining industry. For the food insecure these medical expenses are an overwhelming burden, eating up more than a quarter of total household expenditure. Analysis of the findings implies households in Panxian cut their spending on food in order to pay for medical treatment. This financial burden is also particularly high in Huize and in Zhen'an, where there are some extreme cases of households allocating nearly a third of their expenditure on medical care, which has proved to be such a financial burden that they have had to reduce their diet to just a staple and oil.

- Most households (92%) have safe drinking water but sanitation remains poor. In Zhen'an 11% of households still have no toilet facilities.

- Some 88% of households depend upon rainwater for crops. The lack of irrigation in drought-prone Shaanxi province (Luonan and Zhen'an) threatens agricultural production and livelihoods.

- All counties report experiencing food shortages in March and April 2010 with a third of villages in Huize short of food during April and May. Shocks such as drought, the high cost of agricultural inputs, illness or accidents affecting household members, floods and rising food and fuel costs among others were felt across all counties with varying levels of severity.

2 METHODOLOGY AND OVERVIEW

2.1 Objectives of the report

China's progress on the first Millennium Development Goal (MDG1)—eradicating poverty and hunger—is widely acknowledged to be a key driver in advancing this goal globally. Improvements in food security, health services, incomes, family planning and care practices have led to under-nutrition rates in children under five dropping from 19.1% in 1990 to 6.9% in 2005.

Nonetheless, according to the Food and Agriculture Organisation (FAO) 123 million Chinese remained undernourished¹ in 2003-2005. That represents 14% of the global total. UNICEF states that 7.2 million of the world's stunted children are located in China. In absolute terms, China continues to rank in the top ten countries carrying the global burden of under-nutrition. China must—and still can—reduce under-nutrition, thus contributing even further to the global attainment of MDG1.

Some 14% of the world's undernourished people are Chinese. China must—and still can—reduce undernutrition.

It is in this context that the United Nations Joint Programme, in partnership with the Chinese government, has conducted this study. The key objective is to improve evidence of household food security through a baseline study in six pilot counties in rural China. The results will be used to guide policy and programmes aimed at reducing household food insecurity in the most vulnera-

¹ According to FAOSTAT the number of people living in a state of undernourishment refers to the condition of people whose dietary energy consumption is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out a light physical activity.

ble populations in China. The study is not meant to be an exhaustive analysis of the food security situation in the country, but to provide a demonstrative example of food assessment tools that may be replicated or scaled up to other places.

This food security analysis will serve to complement the other studies in the Joint Programme and provide some baseline information on the six pilot counties. Food security is recognized as a key factor in the analysis of nutrition, which is one of the main aspects of the Joint Programme. This marks the first time that household food security studies have been conducted in rural China, so the analysis will be an important contributor to the advancement of the field of food security analysis and in the national capacity to identify the populations most vulnerable to hunger.

2.2 Selection of the six counties surveyed

As part of the UN-Spanish Joint Programme, “Improving nutrition, food safety and food security for China’s most vulnerable women and children,” six counties were selected from the Nationally Defined Key Poverty Counties (NDKPCs) where the food security status was considered to be the worst.

In 1994 the government of China identified 592 counties as Nationally — Defined Key Poverty Counties (NDKPCs), based on annual net per capita incomes of less than RMB 400 (approximately US \$ 58). The list of counties was updated in 2006 with some counties being added and others removed due to changes in per capita income but there are still a total of 592 counties spread across 21 provinces accounting for nearly 233 million people (18% of the national population). The counties are concentrated in the western region of China in mostly mountainous areas. Almost a third of them are within three provinces: Yunnan (73 counties), Guizhou (50 counties), and Shaanxi (50 counties).

The NDKPCs have been the focus of several government programmes aimed at increasing agricultural productivity and reducing poverty¹. In 1994 the Chinese government introduced the seven-year National Plan for Poverty

¹ Information is drawn from provincial-level reports since county-specific targeting information is not readily available.

Reduction to improve the conditions of the 80 million citizens classified as poor (also known as the “8-7 Plan”). The 8-7 Plan specifically addresses poverty reduction in the 592 NDKPCs through three major group objectives:

- Improve agricultural production and access to non-farming activities in rural areas
- Improve roads, electricity and access to drinking water
- Provide universal primary education and basic health care

Notably, improving access to non-farming activities often involves outward labour migration.

A year later the government launched the Southwest Poverty Reduction Project in collaboration with the World Bank to address specific regional development issues in the southwest. This project, whose objectives are in line with those of the 8-7 Plan, specifically targets counties in Yunnan and Guizhou provinces.

The 8-7 Plan had a positive impact on rural poverty and achieved many of its objectives although poverty still persists, predominantly concentrated in western China. But county level statistics on poverty prevalence are aggregated, which masks the huge differences between villages, leading to less effective policy and programme decisions.

To address the new context of poverty, the government launched a New Century Rural Poverty Alleviation Plan in 2001 which shifts its targeting focus from the 8-7 Plan’s poor counties to poor villages. This poverty reduction plan is focused on human capital and social development, employing a participatory approach among targeted villages.

The selection of the six counties for this report was first guided by “A Report on the Status of China’s Food Security”, a joint study conducted in 2009 by the Chinese Academy of Agricultural Engineering (CAAE) and Chinese Academy of Agricultural Sciences (CAAS) in partnership with FAO, WFP and the International Fund for Agricultural Development (IFAD).

This study, using various secondary data, examined food security at county level, from the list of 592 NDKPCs, from 5 aspects: food availability, access to food, food utilization, consumption and nutrition, and vulnerability. This analysis further classified counties into three distinctive groups in terms of food security. The worst off group consisted of 271 counties in nine provinces, representing

90.5 million people, 7.3% of the national population¹.

These 271 counties were then further narrowed by their capacity and willingness to partner with the UN-Spanish Joint Programme so that the various organisations' activities and data could be integrated. Ultimately, six counties were chosen from three provinces:

- Zhen'an and Luonan (Shaanxi province)
- Huize and Wuding (Yunnan province)
- Panxian and Zheng'an (Guizhou province)

2.3 Structure of this report

This report is focused on the key food security issues found in the six counties using primary data collection. It is not an exhaustive statistical report of the survey data. The details of the data collected can be found in Annex 2.

The structure of the report includes a brief summary of the methodology used for the survey, followed by a comprehensive description of the six counties in terms of their geography, demography, economy, exposure to natural disasters and external shocks, agricultural productivity, accessibility, seasonal factors and the policies and programmes focused upon them. This information is derived both from the data collected during the survey and various secondary sources.

With this context established, the current food security situation and relevant survey findings are discussed per county. The causalities of household food insecurity are highlighted in the following section with the key issues in each county discussed in detail. Finally, a section on recommended actions to remediate food insecurity from a policy and programming perspective complete the report.

2.4 Key concepts

Food security as a concept is commonly defined as the state of being in

¹ A Report on the Status of China's Food Security, Dr. Xiao Yunlai, Dr. Nie Fengying.

which "... all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"¹. This definition highlights the cross-cutting nature of food security with several levels of determinants. The concept of food security is often examined in three key dimensions: food availability, food access and food utilization.

Food availability represents the aggregate availability of physical supplies of food in the area of study, through all forms of domestic production, commercial imports, food aid and national stock. This may be aggregated at the regional, national, district or community level. In the case of this study, food availability has been analysed at the county level where possible, but often provincial statistics are used to inform the discussion.

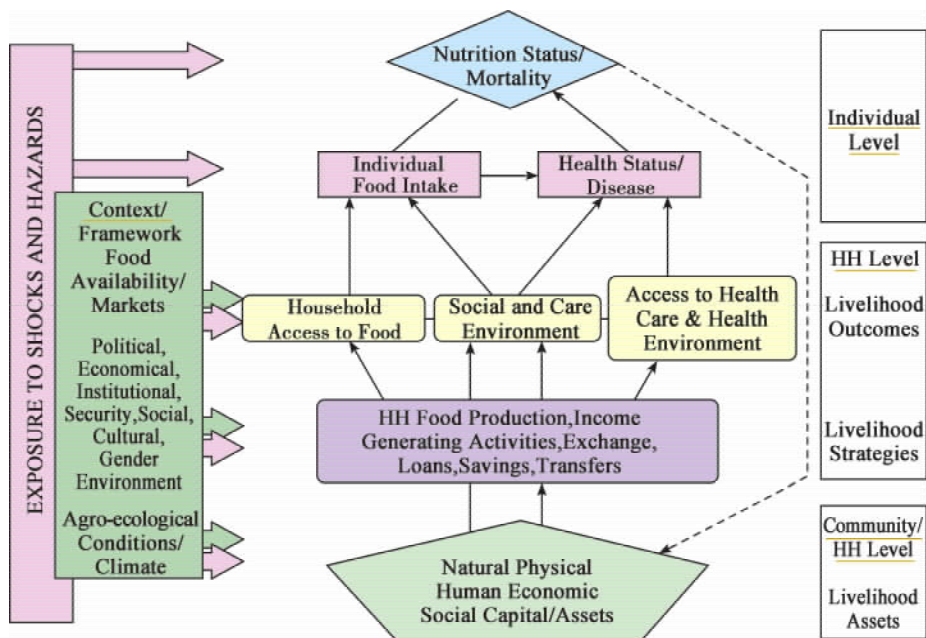
Food access represents a household's ability to acquire adequate amounts of food regularly, through a combination of its own production and stocks, market purchases, barter, gifts, borrowing or food aid. For households engaged in farming access is often directly related to the productivity of agricultural land. For households that mostly purchase their food access is chiefly determined by the price of food and their level of wealth.

Food utilization refers to a household's use of the food to which it has access, and an individual's ability to absorb and metabolize the nutrients, i.e. the conversion efficiency of the body. It also includes elements such as the preparation of food, distribution of food among the household members, hygiene, etc. Food utilization is often one of the most difficult aspects of food security to analyse because intra-household dynamics and the health status of individuals is very difficult to ascertain.

A conceptual framework for food security analysis has been adapted from an established UNICEF framework for examining the causal paths of malnutrition. Figure 1 highlights the various levels and domains used in analysis of food security which have been applied in this report.

¹ World Food Summit, 1996.

Figure 1 Food and nutrition conceptual framework



2.5 Indicators used in the analysis

2.5.1 Food consumption score

Food consumption is a reflection of food availability and food access at the household level and is often used as a proxy indicator of the current food security situation. The key elements of household food consumption are the diversity and frequency of foods consumed and their nutritional value. While various methodologies exist to measure household food consumption, the approach used widely by WFP, and in this report, is the food consumption score(FCS).

The FCS is calculated using a seven-day recall food consumption module in a household interview. Households are asked during how many days in the past week they consumed various food items that have been adapted to local diets. During the analysis, each food item is categorized into eight distinct food groups (cereals, pulses, vegetables, fruits, meat and fish, milk, sugar, oil).

Then, the frequency of consumption of each food group is calculated, not exceeding seven days in a week. Each food group is assigned a weight based upon WFP standards which reflect the relative nutritional value of each group. The weight is multiplied by the frequency of consumption and summed to create the FCS. More details on the calculation are found in Annex 1-4.

To create a more meaningful analysis, the FCS is then used as a measure to divide the population into three food consumption groups:

- Households with poor consumption
- Households with borderline consumption
- Households with acceptable consumption

These three groups are created using standard thresholds which may be adapted to capture accurately the local dietary situation. More details on the thresholds and the rationale for their determination are found in Annex 1-4.

2.5.2 Wealth index

A key component of food security analysis is poverty analysis. Classifications of poverty or wealth are often difficult to establish as reliable data is not easily captured through household surveys. The creation of an index to measure the relative wealth of households is done by examining more reliable indicators of how well-off or how poor a household is. Considering that we use the term ‘wealth’ to refer to the value of all natural, physical and financial assets owned by a household, an index that takes these assets into consideration can act as a proxy indicator for wealth.

The wealth index is an indicator of relative wealth, constructed using appropriate house construction data (such as the materials of the roof and/or walls), household assets, access to water, sanitation, electricity and other such non-livelihood-specific indicators. It is a proxy for economic wealth, but is not intended or able to replace poverty statistics such as computation of the poverty line. As a comparative indicator, it can indicate who is ‘wealthier’ or ‘poorer’, but not who is ‘wealthy’ or ‘poor’ in absolute terms.

Once a household is assigned a wealth index value based on its properties, the population is then ranked and divided into quintiles to allow for descriptive analysis of households. Generally in this analysis, households belonging to the two poorest quintiles are referred to as ‘poor households’. For a more detailed

description of the construction of the wealth index, refer to Annex 1-2.

It has to be noted that wealth and the corresponding wealth index is linked to income, but is not necessarily the same. Income is dynamic, which has to support consumption firstly; while wealth measures the surplus after daily life and production expenditure. So wealth and income are not always consistent, which is particularly true in Panxian.

2.5.3 Livelihoods

Livelihoods are the capabilities, assets (both material and social), and activities required for a means of living linked to survival and future well-being¹. The livelihoods in which a household engages directly influence food security, making them an essential component of food security analysis.

For this assessment, livelihood clusters were created from the income activity module of the household questionnaire. The clusters were used to group households sharing the same basic means of subsistence and therefore facing the same risks of food insecurity. The livelihoods approach is a key factor in identifying the food insecure populations because it highlights those least sustainable income generating activities that jeopardize food access. Details on the cluster analysis conducted to create livelihood groups can be found in Annex 1-3.

2.6 Sampling methodology

The required sample size for the survey was calculated using standard sample size calculations with each county representing a stratum (see Annex 1-1 for details). After the sample size was calculated, a two-stage clustering approach was applied.

The first stage is the selection of villages using the probability proportional to size (PPS) method to create a self-weighted sample in which larger population clusters (villages) have a greater chance of selection, proportional to their size. Following the selection of the villages, 12 households within the village were

selected using simple random selection. In each county, 228 households were interviewed from 19 villages totalling 1,368 households across the six counties.

2.7 Instruments used

Two instruments were used during the primary data collection: a household questionnaire and a village questionnaire. The household questionnaire was administered to all households in the survey and included modules on demography, education, migration and remittances, housing and facilities, household assets, agriculture, income activities, expenditures, food sources and consumption, and shocks and coping strategies.

The objective of the village questionnaire was to gather contextual information on the six counties for descriptive purposes. In each village visited, a focus group discussion took place on topics including:

- The population of the village
- Number of migrants
- Access to social services such as education and health
- Infrastructure
- Access to markets
- Difficulties facing the village
- Information on the local agricultural practices

The questionnaires were developed by WFP and CAAS with inputs from partnering agencies. They were originally formulated in English and then translated into Mandarin. They were pilot tested in the field and corrected as needed. The final interviews were administered in Mandarin with translation provided in the local language when needed.

2.8 Data collection

The survey was conducted from the 9th of August until the 30th of September, 2010 with each county surveyed in succession, beginning in Shaanxi province and ending in Guizhou. This time period was regarded as ‘normal’ by local people since it is neither the harvest nor lean season and there were no major festivals.

The data collection team was composed of 28 enumerators divided into 10

teams. It included the programme leader, a group of supervisors, local government officials and enumerators from CAAS and local universities within each province. The Ministry of Agriculture, the Ministry of Science and Technology and local government officials facilitated the field work.

2.9 Data entry and analysis

After data collection, data entry was carried out by CAAS staff in Beijing using EpiData software. The datasets were then exported into SPSS for analysis. Data cleaning was an iterative process throughout the data entry and analysis phases.

Descriptive analysis, correlation analysis, principle component analysis, cluster analysis and various other forms of analyses were conducted using SPSS. More details on the analysis and methodologies are found in the indicators section of the report as well as in Annex 1.

2.10 Limitations

Although every measure possible was taken to guarantee the quality of the primary data collection, some limitations arose. Floods and landslides prevented the team from visiting two of the selected villages, one in Wuding and one in Panxian, so they substituted them with replacement villages. Eight villages in the counties of Wuding, Huize and Panxian were purposely selected to coincide with selection by other Joint Programme activities.

3 OVERVIEW OF THE SIX COUNTIES

3.1 Geography and demographic composition

The six counties selected for this study are located in the mountainous western region of China in the provinces of Shaanxi in the northwest and Guizhou and Yunnan in the southwest. The combined population of Luonan, Zhen'an, Zheng'an, Huize, Wuding and Panxian counties is 3.76 million, Panxian being the most populous with 1.17 million and Wuding the least with 270,000. Some 90% of the population in these regions are classified as rural compared to 53% nationally.



While the average household size in China was just 3.2 in 2009 because of the one child policy implemented in 1979¹, the average in the six rural counties is substantially larger at 4.4 with the lowest in Panxian(4.1) and the highest in Wuding and Luonan(4.6)².

It should be noted that government allows some exceptions to the one child policy in some rural areas, especially in

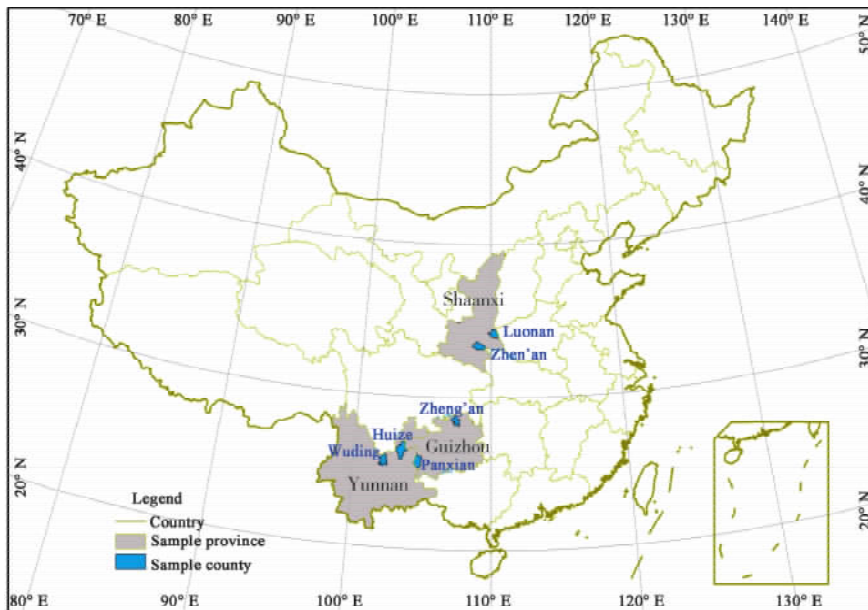
The average household size in China is just 3.2 because of the one child policy, but is substantially higher in the six rural counties, at 4.4.

¹ China Statistical Yearbook, 2010.

² Here, household size uses the traditional definition of the family which includes members (such as the mother and/or father) who have migrated away for work.

autonomous ethnic areas such as Chuxiong Yi, where Wuding is located.

Figure 2 The six counties surveyed



The one child policy has also played a major role in keeping household dependency ratios¹ low. The total dependency ratio in China was 36.9% in 2009, with a child dependency ratio of 25.3% and an elderly dependency ratio of 11.6%. These low figures reflect the controlled fertility rate and the fact that the large majority of the total population is of working age. The dependency ratio across the surveyed counties is 42.1% split between a child dependency of 29.6% and elderly dependency of 12.6%. This ratio is higher than the national dependency ratio and is clearly influenced by the larger family sizes in the surveyed counties. The highest overall dependency ratio is found in Panxian(47.2%), with child dependency ratio highest in Zheng'an(34.1%) and elderly dependency highest in Zhen'an(16.3%).

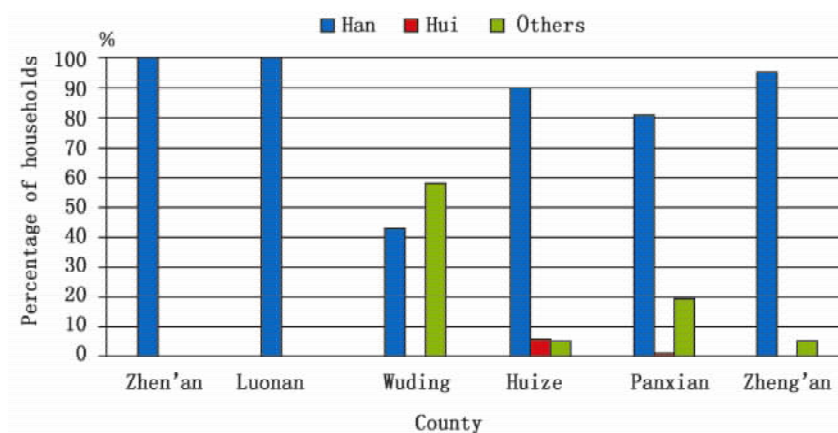
¹ Dependency ratio refers to the ratio of dependent household members(age 0-14 or above 65) to the number of independent members(members age 15-64).

Table 1 Dependency ratios across the surveyed counties

	Total dependency ratio (%)	Elderly dependency ratio (%)	Child dependency ratio (%)
Zhen'an	34.7	16.3	18.4
Luonan	30.3	10.7	19.6
Wuding	43.0	14.0	29.0
Huize	43.0	12.5	30.5
Panxian	47.2	13.5	33.7
Zheng'an	43.6	9.5	34.1
Total	42.1	12.6	29.6

Nearly 92% of the population of China is of Han ethnicity, but across the six counties surveyed 86% is Han, 2% Hui and 12% of another ethnicity. The government officially recognizes 56 ethnic groups. Ethnic minorities account for nearly half (46%) of the extreme poor nationally¹. The provinces in the south, west and extreme north have a much higher representation of ethnic minorities than in most other parts of the country. Wuding has the largest proportion of minorities out of the six surveyed counties; 58% of households are non-Han.

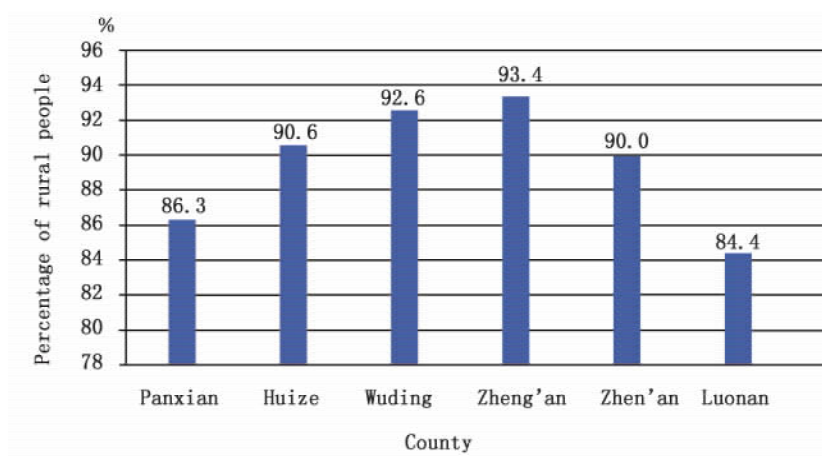
Figure 3 Ethnic groups by county



¹ UNDP China, 2008.

Over the last 30 years China has experienced a dramatic shift from a rural population to an urban one. The percentage of the population living in rural areas has fallen from 82.1% in 1978 to 53.4% in 2009¹. The NDKPCs (defined as the most under-developed counties in China as measured by per capita income), including the six counties surveyed, are predominantly rural. Between 84.4% and 93.4% of the population in all six counties surveyed was considered rural.

Figure 4 Percentage of population that is rural

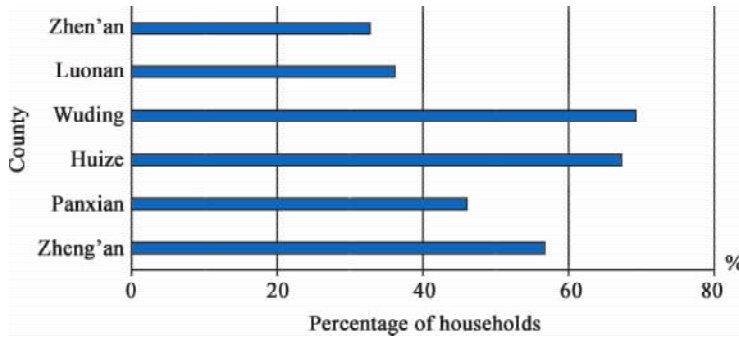


3.2 The economy

Agriculture is the main source of income with over half (53%) of households listing an agriculture-related activity (production and sale of crops, live-stock rearing or selling, seasonal and non-seasonal agricultural labour) as their main source of income. Wuding is the most dependent on agriculture as the main income source (69%) and Zhen'an the least (33%).

¹ China Statistical Yearbook 2010.

Figure 5 Percentage of households listing agriculture as main income activity



Ninety-five percent of the households surveyed have access to agricultural land. Only Zhen'an and Panxian have a notable proportion of households without land, each with 9%. Maize is the main crop with Zheng'an and Wuding producing substantial rice crops. Huize has a significant amount of potato cropping which is a staple part of the diet. In Wuding, there is also cash cropping in the form of tobacco.

The average per capita income of the six counties surveyed, at CNY 2,103 (US\$ 323.5) is just over half the average per capita income for rural households nationally, CNY 4,140 (US\$ 636.9) in 2007. As seen below, the two counties in Shaanxi province, Zhen'an and Luonan rank the lowest out of these counties and are among the lowest in China.

Table 2 Average per capita income

County	Per capita income(CNY)	Rank in NDKPCs(of 592)
Panxian	2,383	215
Huize	2,326	236
Wuding	2,141	328
Zheng'an	2,073	364
Zhen'an	1,852	454
Luonan	1,844	457
Average of six counties	2,103	
National(rural)	4,140	

Note: Data refers to nominal income in 2007.

Migration is a ubiquitous practice in China with 20% of the rural population migrating in 2009¹. The average for the six counties surveyed is in keeping with the national figure with the highest rate of migration found in Luonan (28%) followed by Zhen'an (25%), where nearly all villages are accessible by a main road (100% and 95% respectively). The lowest is in Panxian (14%). Migrants are typically young men (age 15-25), though women also have high rates of migration. The duration of migration varies across the counties. Migrants tend to leave for less than a year in Zhen'an (66%) and Luonan (58%), while in the other counties migration of more than a year is the norm with people usually returning for the Spring Festival in February.

Figure 6 Percentage of migrants by county

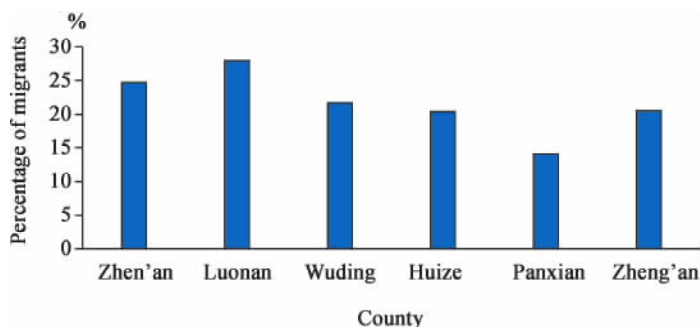
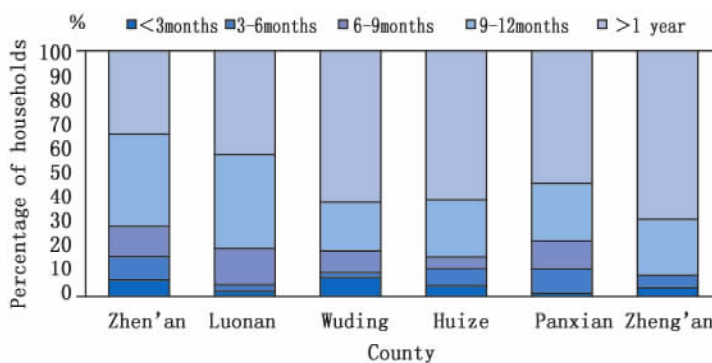


Figure 7 Length of migration periods

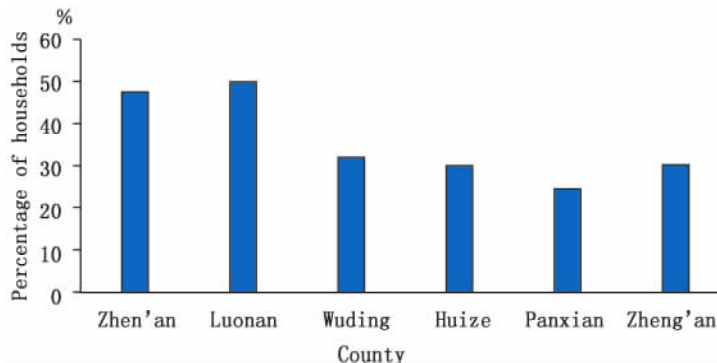


¹ National Bureau of statistics of China, Monitoring Report of Migrant rural workers 2009.

The quest for a better income drives the majority(62%)to migrate while the next most frequently listed factors are the lack of land or resources(17%) and education(11%). Wuding has the highest proportion of migrants because of lack of land or resources(23%)and Panxian the highest pursuing education (16%).

Remittances are a key component of the household economy in rural China (see Figure 8). Across the six counties,32% of households receive remittances with the highest proportion in Shaanxi province where 47% of those in Zhen'an and 50% of those in Luonan receive remittances. Panxian receives fewer remittances than the other counties surveyed—but a quarter of households in the county still receive money from migrant workers.

Figure 8 Percentage of households receiving remittances



3.3 Access to education, communications and health facilities

Education levels across the six counties are below the national average with nearly a fifth(18%)of household heads having no education whatsoever. The percentage peaks in Huize and Panxian where 27% and 21% of household heads have no education respectively. The head of household's spouses (usually women)are less educated with almost 40% having no education—though this rises to 50% in Huize and 43% in Panxian.

Table 3 Household head level of education(percentage)

	No school	Some elementary	Completed elementary	Some junior high school	Completed junior high school	Some senior high school	Completed senior high school	Vocational	University and above
Zhen'an	15.4	24.1	19.7	9.6	21.5	0.9	7.0	1.8	0
Luonan	6.6	11.0	17.1	6.1	45.2	1.8	11.0	1.3	0
Wuding	9.2	17.5	20.2	11.8	35.5	0.4	3.9	1.3	0
Huize	26.8	19.7	19.3	5.7	23.7	0.4	3.1	1.3	0
Panxian	20.6	19.3	19.3	5.7	30.7	0.4	3.1	0.9	0
Zheng'an	12.3	27.6	27.6	3.9	24.1	0.9	2.6	0.9	0
Total	18.1	19.9	20.4	6.3	29.2	0.7	4.3	1.1	0

Table 4 Spouse level of education(percentage)

	No school	Some elementary	Completed elementary	Some junior high school	Completed junior high school	Some senior high school	Completed senior high school	Vocational	University and above
Zhen'an	24.6	20.6	18.9	4.4	18.4	0.9	3.9	0	0
Luonan	18.9	10.5	21.5	6.6	28.1	1.3	3.1	1.3	0
Wuding	24.1	25.0	17.5	3.9	20.2	0	2.2	0.9	0
Huize	50.0	18.4	10.5	2.2	11.8	0	1.8	0.9	0
Panxian	43.4	17.1	16.2	2.6	11.8	0	0.4	1.8	0
Zheng'an	43.0	20.6	18.4	1.8	9.2	0.4	0.4	0	0
Total	39.2	18.0	16.0	3.1	14.5	0.3	1.5	1.0	0

School access is fairly good across the six counties thanks to the government's focus on establishing elementary schools as part of the poverty alleviation programmes in the NDKPCs. The poorest coverage is in Zhen'an county where just over half of villages have schools (53%), followed by Panxian (63%) and Luonan (79%). Although children living in villages without a primary school need to make an average journey of four kilometres to reach one, the government has focused on building boarding schools thus children need to make the journey twice a week instead of every day. For this reason, the percentage of children attending school would have been a better indicator than the number of villages with schools, but unfortunately this data was not collected.

Secondary schools tend to be built in larger communities or towns with students from outlying villages given subsidies to board there.

Ninety percent of the villages visited are connected to a main road, again reflecting the investment in infrastructure under the rural poverty alleviation policy¹.

Basic health services range from health centres to private clinics and traditional village doctors. Only three percent of the villages surveyed report having no health services. However, as discussed later, households bear a substantial burden of medical expenses.



3.4 Water access, sanitation and housing conditions

Drinking water quality across the six counties is fairly good, with 92% of households having access to improved water sources². This reflects the positive impact of the National Plan for Poverty Reduction which specifically addressed access to clean drinking water in the NDKPCs. Approximately half of all households in the six counties obtain water from

‘mountain sources’, which are channels from mountain springs piped directly into houses and considered to be pure water sources. Piped water and protected wells are the next most frequent source of drinking water. Zhen’an and Huize

Most households have safe drinking water but sanitation conditions remain very poor with flush latrines used by fewer than 7%.

¹ It should be noted that there is some selection bias in these results since dangerous road conditions made two of the villages selected for visit inaccessible.

² Improved drinking water refers to piped water, protected wells, rain water collected in tanks, and piped water using gravity systems from mountain sources. These categories are based upon definitions from the WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation. <http://www.wssinfo.org/definitions-methods/watsan-categories/>.

fare worst in terms of access to improved drinking water with around 12% of their supplies coming from unprotected sources.

Table 5 Drinking water sources(percentage)

	Piped water	Protected well	Mountain source	Rain water	Unprotected well	River, stream or dam	Others	Improved drinking water
Zhen'an	13.6	5.3	64.5	4.4	5.7	6.6	0	87.7
Luonan	27.6	36.4	27.6	0.9	4.4	1.8	1.3	92.5
Wuding	39.5	4.4	46.1	2.2	2.2	5.3	0.4	92.1
Huize	33.8	9.6	37.7	7.0	7.0	4.4	0.4	88.2
Panxian	22.4	13.6	55.3	3.5	3.1	1.3	0.9	94.7
Zheng'an	25.4	5.7	61.8	0.9	5.3	0.9	0	93.9
Total	26.8	12.8	48.6	3.7	4.7	2.8	0.6	91.9

While most households benefit from safe drinking water, sanitation conditions remain very poor. Most (72%) use a traditional dry pit latrine, which have a slab for squatting but no proper drainage. Flush latrines are used by fewer than 7% of households though the percentage is considerably higher in Zheng'an(15.8%)and lower in Huize(3.1%)and Wuding(3.9%). Interestingly Zheng'an also has the highest prevalence of no toilet facilities at all(11%) suggesting a heterogeneous level of improvement in sanitation across villages within the county.

Table 6 Toilet facilities(percentage)

	Flush latrine	Traditional pit latrine	(Partly) open pit	Communal latrine	None/go to forest
Zhen'an	7.0	65.4	24.1	1.8	1.8
Luonan	6.1	82.9	10.1	0	0.9
Wuding	3.9	75.9	11.0	3.5	5.7
Huize	3.1	72.8	15.8	3.9	4.4
Panxian	6.1	72.4	16.2	1.3	3.9
Zheng'an	15.8	61.0	12.3	0	11.0
Total	6.7	71.7	15.1	1.8	4.7

A survey of housing conditions, including data on roofing, wall materials and sources of energy for cooking, reveals a wide variation across the counties.

Wood is the main energy source for cooking across all counties (particularly in Zhen'an, where 93% of households depend on it). In the coal producing county of Panxian, 40% of households use coal as a cooking fuel source. Electricity is the second major source of energy for cooking with 16% of households depending on it, though the proportion is much higher in Huize and Zheng'an (27%).

For roofing almost all households boast steel, reinforced concrete or tile with a tiny minority (less than 1%) using natural materials such as bamboo or grass. Wall materials are not as robust; more nearly a third (32%) of households use earth (mud) with the highest proportions in Wuding (73%), Zhen'an (68%), and Huize (57%). Some households have stronger structures; in Huize 18% of households have brick walls while in Panxian and Zheng'an counties in Guizhou province an average of 6.5% opt for steel, reinforced concrete, brick or wood walls.



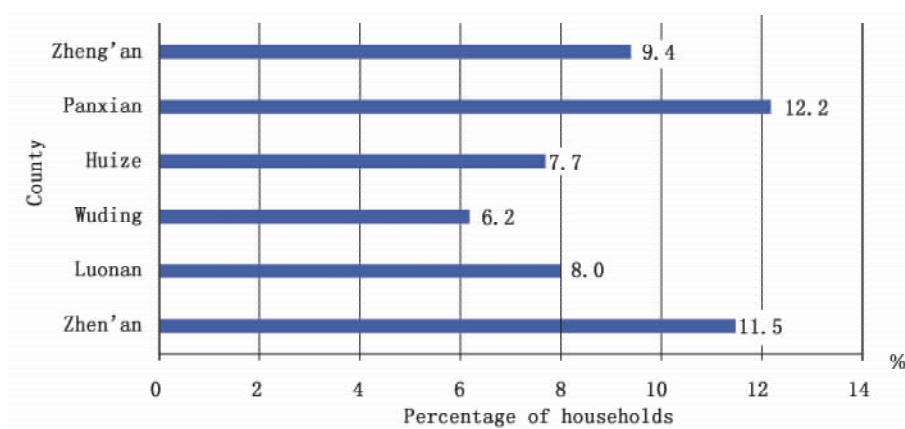
Table 7 Sources of energy for cooking (percentage)

	Electricity	Liquid fuel	Wood	Coal	Charcoal	Sawdust	Gas	Straw	Biogas
Zhen'an	1.8	0	92.5	0	3.1	0	0	0.9	1.8
Luonan	1.8	0	72.8	1.3	1.8	0	2.6	18.9	0.9
Wuding	21.1	0	58.8	0	1.3	0	0	0.9	18.0
Huize	26.8	1.3	47.4	16.7	0.9	0	0.4	4.0	2.6
Panxian	19.7	0	31.6	39.5	0.9	0.4	0	0.4	7.5
Zheng'an	26.8	0.4	51.3	5.3	0.9	0	0	4.4	11.0
Total	16.3	0.3	59.1	10.5	1.5	0.1	0.5	4.9	6.9

Access to credit is well established in the rural counties thanks to rural coopera-

tives(a government programme)and strong informal networks through families and friends. However,13% of households remain without any sources of credit making them less resilient to shocks,less able to invest in improving their housing,sanitation or farming techniques. The highest proportion of households with no access to credit is in Zhen'an(11.5%)and Panxian(12.2%).

Figure 9 Households with no access to credit



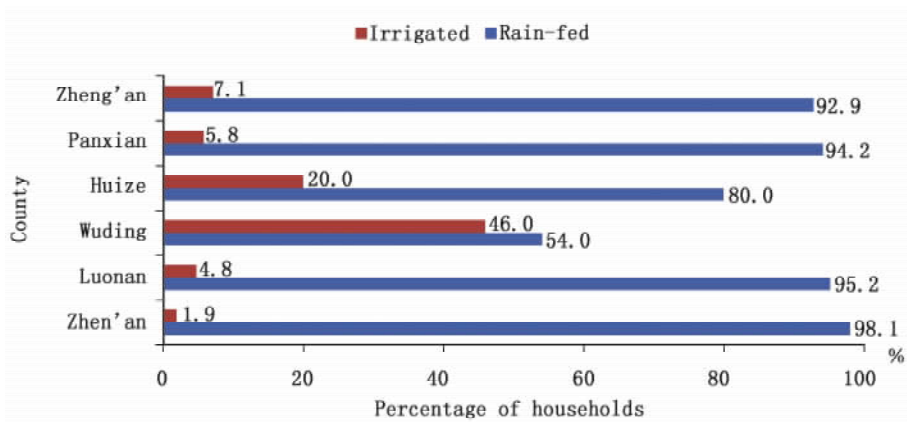
3.5 Food supply snapshot

As mentioned above maize is the main crop with Zheng'an and Wuding producing substantial rice crops. Huize has a significant amount of potato cropping which is a staple part of the diet. In Wuding, there is also cash cropping in the form of tobacco.

On average 88% of households depend upon rainwater rather than irrigation to water their crops, though 46% of households in Wuding use irrigation techniques. The lack of irrigation in the counties in drought-prone Shaanxi province (Luonan and Zhen'an counties) threatens agricultural production and related livelihoods.

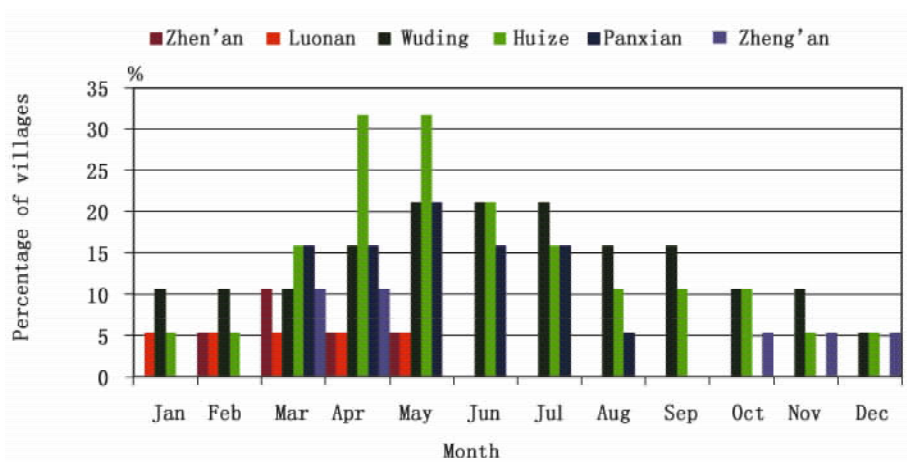
Though most of the villages sampled (77%) have no regular food market, households on average only have to journey 7.4 kilometers to markets and can always buy supplies from local street vendors and small shops stocking some food items.

Figure 10 Source of water for agriculture



Communities were asked which months they usually face food shortages i. e. the periods during which they are not able to be food self-sufficient and are more reliant on markets. Figure 11 below shows that all six counties report experiencing food shortages in March and April with Huize experiencing the greatest shortages in April and May when over 30% of villages lack supplies. For Wuding the leanest months are May, June and July when more than a fifth of villages face food scarcity. It should be noted that spring of 2010 was not necessarily typical spring since record droughts in late April/early May affected the southern region of China including the provinces of Yunnan (Wuding and Huize counties) and Guizhou (Panxian and Zheng'an counties).

Figure 11 Seasonality of food shortage in villages



3.6 Natural disasters and other shocks

Households were asked to list the main and two additional shocks that affected them in the past year. Shocks include natural phenomena such as droughts and floods and economic hardships such as high fuel and food prices. Across all



six counties, drought, illness or accidents affecting household members and high agricultural input prices were listed as the top three shocks.

Diverse natural hazards affect the six rural counties. Shaanxi province is a drought-prone area with extreme weather patterns—very cold in the winter with hot, dry winds in the summer. Households in Shaanxi, who are routinely subjected to drought conditions, did not list droughts as a significant shock. But the typically more precipitous rice-producing regions of Guizhou and Yunnan (peak rainfalls June–August) were hit heavily by the drought of spring 2010.

Drought, unemployment, illness and high costs of agricultural inputs, food and fuel shocked households significantly across all six counties.

Some 87% of all Wuding households and 89% of Huize households listed droughts as one of the three shocks to have affected them in 2010 and more than two-thirds of households in both counties listed drought as the main shock.

In Guizhou, drought was also the main shock, particularly in Panxian where 86% of households reported drought as a shock, but less so in the more northerly Zheng'an where 66% were affected.

It appears that households in drought-prone Shaanxi are rarely 'shocked'

by droughts with only 5% in Zhen'an and 13% in Luonan listing it as their main shock. The 'normal' state of drought has resulted in adaptation including the production of low water-intensive crops such as maize. Here the main shock was illness of a household member at 23% in each county. Floods affected 33% of households in Zhen'an, the most prevalent shock in the county. In Luonan, the most commonly reported shock is the high cost of agricultural inputs, affecting 33% of households.

Table 8 Percentage of households affected by shocks

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Drought	20.9	28.8	87.0	88.9	85.9	66.2
Floods	33.2	12.5	5.4	2.8	8.2	29.3
Hail	1.5	10.3	10.3	11.1	6.4	0
Frost	24.5	24.5	4.5	10.6	15.5	1.4
Unusually high temperature	8.7	11.4	8.1	7.9	5.0	2.3
Hot winds	13.3	10.3	4.9	9.3	27.3	13.5
Landslides	7.7	2.7	0.9	0.9	3.6	10.8
Crop pests & disease	4.1	5.4	13.0	12.0	2.3	5.4
Livestock diseases	11.7	2.7	8.5	20.4	7.7	9.5
Lack or loss of employment	18.4	15.2	17.5	19.4	10.5	23.4
Fire	0.5	0.5	1.8	0.9	0.5	0
High costs of agricultural inputs	21.4	33.2	34.1	29.6	16.8	14.9
Earthquake	0	0.5	4.0	0.9	0	0.5
Reduced income of a household member	7.1	9.2	11.2	11.6	10.5	9.0
Serious illness or accident of household member	25.5	27.2	24.2	21.8	28.6	34.7
Death of a working household member	1.0	0.5	0.9	0.5	0.9	0.5
Death of other household member	0	1.6	0.9	0.5	0.5	0.9
High food/fuel prices	24.0	22.8	19.3	16.2	15.9	12.6
Crop destroyed by wildlife	7.1	1.1	0.4	1.4	0	6.8
Others	0	0	0	0.5	0	0.5

Table 9 Main shocks affecting households(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Drought	5.1	12.8	67.7	62.9	53.0	33.5
Serious illness or accident of household member	23.3	23.3	12.7	12.7	20.1	24.0
High food/fuel prices	4.0	6.1	0.9	3.3	4.6	4.1
High costs of agricultural inputs	3.4	10.0	2.3	0.5	0.5	2.3
Lack or loss of employment	5.1	5.6	2.3	3.8	2.7	9.5
Floods	15.9	5.6	1.8	0.5	1.8	9.0
Hail	0.6	5.0	0.9	3.3	0.9	0
Frost	14.8	13.3	1.8	1.4	3.2	0.5
Livestock diseases	5.7	1.7	2.7	5.2	1.8	5.9
Unusually high temperature	1.1	2.2	1.8	0.9	0	0
Hot winds	6.8	7.2	0.5	0.9	5.5	3.2
Landslides, erosion	3.4	1.1	0	0	0.9	3.2
Crop pests & disease	0.6	0.6	0.5	1.4	0	0.5
Fire	0.6	0	0.9	0	0.5	0
Earthquake	0	0	1.8	0	0	0
Reduced income of a household member	4.0	2.8	0.5	1.4	4.1	2.3
Death of a working household member	1.1	0.6	0.9	0	0.5	0
Death of other household member	0	1.1	0	0	0	0.9
Theft of money/valuables	0	0	0	0	0	0
Theft of animals	0	0	0	0	0	0
Conflict	0	0	0	0	0	0
Crop destroyed by wildlife	4.5	1.1	0	1.4	0	1.4

4 FOOD SECURITY OVERVIEW

The prevalence of food insecurity varies across the counties studied. Luonan has the highest proportion of households defined as food insecure (35%) followed by Zheng'an (19%) and Zhen'an (18%) while the other three counties have significantly fewer food insecure households: 7% in Panxian and Huize and 6% in Wuding.

It should be noted that of those food insecure households very few have 'poor' food consumption. They are more likely to have 'borderline' food consumption, which is evidently less severe.

How is food security measured?

The Food Consumption Score (FCS) was calculated for each household in the six counties surveyed. The population was divided into relevant food consumption groups based upon standard thresholds as detailed in Annex 1–4.

The food insecure households have poor (severe) or borderline (moderate) food consumption.

The food secure households have acceptable levels of food consumption.

Figure 12 Percentage of food insecure

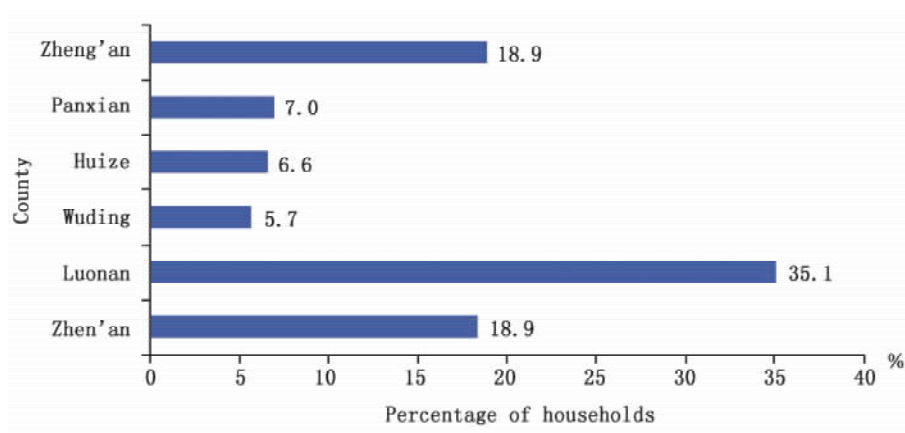


Table 10 Prevalence of food insecurity(percentage)

County		Prevalence	Food insecure
Zhen'an	Poor food consumption	1.3	18.4
	Borderline food consumption	17.1	
	Acceptable food consumption	81.6	
Luonan	Poor food consumption	0.4	35.1
	Borderline food consumption	34.6	
	Acceptable food consumption	64.9	
Wuding	Poor food consumption	0.9	5.7
	Borderline food consumption	4.8	
	Acceptable food consumption	94.3	
Huize	Poor food consumption	0	6.6
	Borderline food consumption	6.6	
	Acceptable food consumption	93.4	
Panxian	Poor food consumption	0.4	7.0
	Borderline food consumption	6.6	
	Acceptable food consumption	93.0	
Zheng'an	Poor food consumption	0	18.9
	Borderline food consumption	18.9	
	Acceptable food consumption	81.1	

4.1 Poverty and food security

Poverty and food insecurity go hand in hand. Poor households, whether in terms of capital, human, or natural resources, are less likely to be able to access food consistently than their wealthier counterparts. Poverty is difficult to measure but several methods allow for some classifications of households in terms of their wealth. In the six counties surveyed, a wealth index was created based on various factors including ownership of assets, the quality of building materials for homes and access to improved water and sanitation (see Annex 1-2 for details on the construction of the wealth index). During the analysis, the entire sample population was then divided into quintiles of wealth based upon the wealth index. The two lowest quintiles of wealth are henceforth used to describe ‘poor’ households.

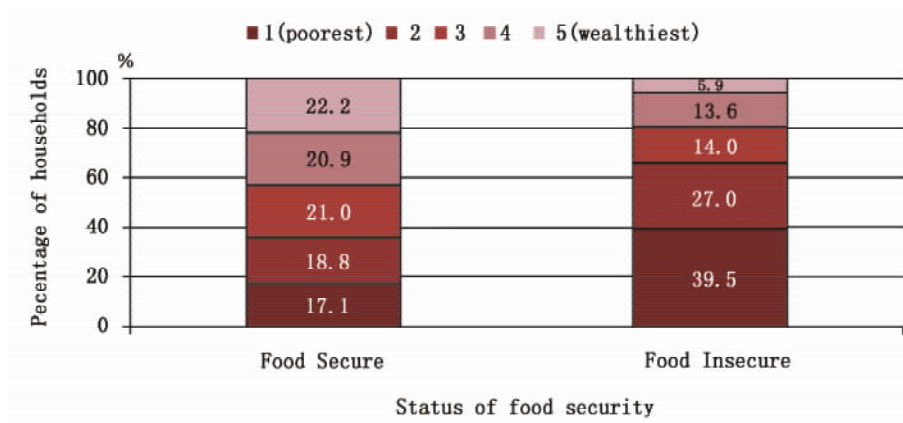
Using the wealth index and subsequent wealth quintiles, relative poverty was assessed in the six counties. As seen in Table 11 below, the highest prevalence of poverty is found in Panxian and Luonan where over half of households are in the two poorest quintiles.

Table 11 Wealth quintiles(percentage)

County	Wealth quintiles				
	1 = Poorest	2	3 = Middle	4	5 = Wealthiest
Zhen'an	17.5	16.2	20.6	25.4	20.2
Luonan	22.4	26.8	18.9	15.4	16.7
Wuding	5.3	17.1	26.8	23.2	27.6
Huize	15.4	14.0	19.7	27.2	23.7
Panxian	27.2	22.4	17.5	18.4	14.5
Zheng'an	18.4	22.4	23.2	10.5	25.4

Figure 13 illustrates the correlation between a household's poverty level and food insecurity. While wealth distribution across the food secure group varies little, the distribution of wealth in the food insecure households varies widely. Forty percent of households defined as food insecure are classified in the poorest wealth quintile and 67% of food insecure households are classified as poor (the two poorest quintiles combined). Poverty and its relationship to food security are further discussed in the section on causes of food insecurity.

Figure 13 Prevalence of poverty by FCG



4.2 Livelihoods and food security

Livelihood clusters

Livelihood clusters (also referred to as groups) are a useful way of understanding what a household does to obtain income, food and wealth.

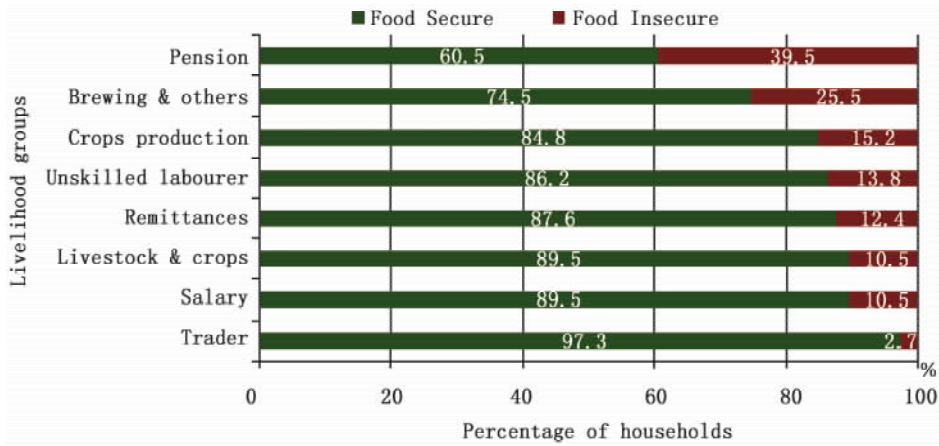
These clusters/groups give meaning to who we are referring to beyond a simple poverty, demographic or geographic classification.

To classify households into livelihood clusters each household lists its three main income generating activities and the proportion of the total income from each activity is noted. The relative contribution of various income activities to the overall livelihood of the household is then calculated so that patterns of livelihoods emerge. Using cluster analysis these patterns are statistically estimated and used to classify households into clusters. For more details on the methodology and the classifications of the livelihood clusters, refer to Annex 1–3.

Households dependent on pensions as their source of livelihood are the most food insecure, in terms of prevalence, with 40% of pensioners falling into the food insecure category. The next most affected group is that reporting ‘brewing’ as well as ‘other’ to be its main income generating activities followed by crop producers and unskilled labourers.

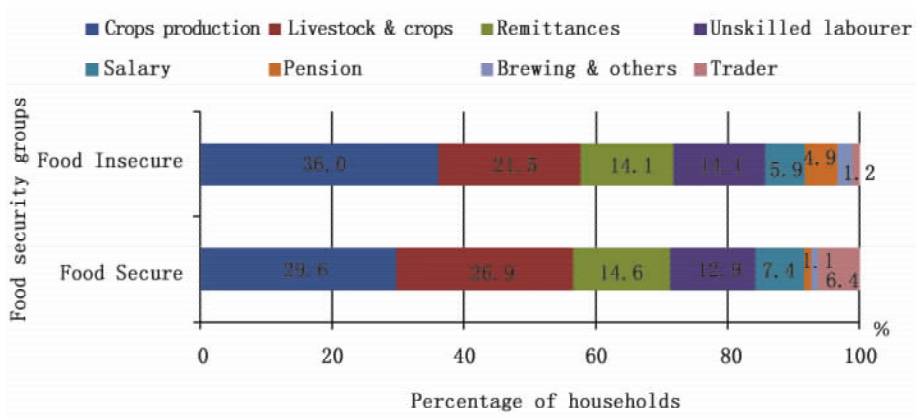
However, it must be noted that although prevalence of food insecurity is high among pensioners and brewers, the absolute number is extremely low. There were 1,368 households surveyed, but only 37 households depend on these livelihoods across the six counties, and 13 of them are food-insecure. On the other hand, there were 416 households engaged in crop production and 72 households or 15.2% of this group (weighted by county population) are food insecure. Therefore those relying on crop production are more important in terms of assessing the overall prevalence of food insecurity.

Figure 14 Percentage of food secure and food insecure by livelihood group



It is more helpful to view the distribution of livelihoods among food insecure households by comparison with food secure households. Figure 15 shows the results of this analysis, which reveals that the crop producers represent the largest proportion (36%) of the food insecure, when their prevalence in the overall population is taken into account, and unskilled labourers account for more of the food insecure than the food secure. These distributions across all six of the counties show interesting trends but more localized differences and their true statistical significance must be measured. This is addressed in the causes of food insecurity section which follows.

Figure 15 Percentage of livelihood group by FCG



4.3 Characteristics of food insecure households

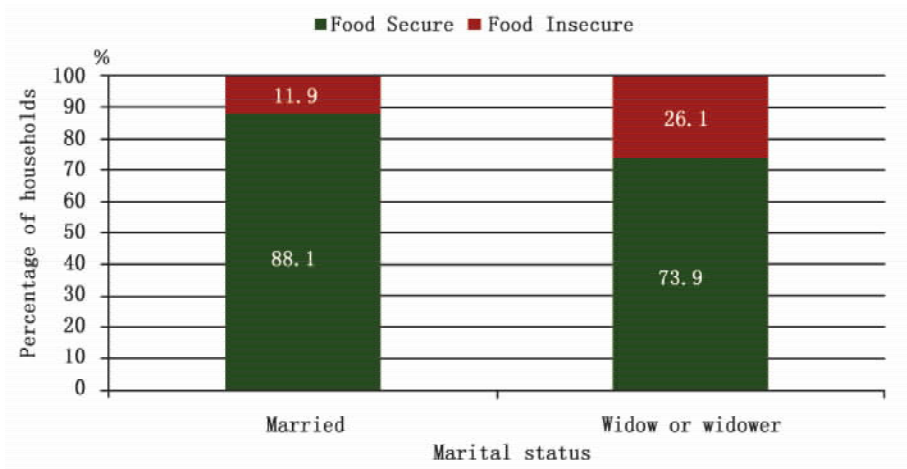
What characteristics can relate to food insecurity?

Various demographic and education factors were examined, particularly with regard to the household head. These include age and gender, marital status, education levels of the head and spouse and the level of dependency in the household.

Food insecure households in the six counties tend to have slightly older heads of households. While the average age of the household head in all of the six counties is 49 years, it is 52 in food insecure households and 48 in food secure households. These differences vary between counties and their significance is discussed later.

There is no significant link between the gender of the household head and food security. Unsurprisingly married heads of households are more food secure than widow(er)s since they have probably lost an important contributor to household income. The divorced, separated and unmarried, were not frequently mentioned and showed no statistically significant differences in terms of food security. Interestingly 62% of widowed household heads are male even though women usually have longer life spans. This may reflect the hard working lives and poorer health status of women in rural China. It also points to the importance of women in the household economy and the strain upon the widower when his wife dies.

Usually the dependency ratio shows a negative correlation with food insecurity however this is not the case in the six counties surveyed. An independent analysis of the elderly dependency ratio and the child dependency ratio across the six counties revealed a positive correlation between child dependency and food security and a negative correlation between elderly dependency and food security.

Figure 16 Food security among widowed versus married household heads

The elderly dependency relationship is as expected; there is greater pressure on working members of households that have a higher proportion of elderly members for whom they must provide. The positive relationship between child dependency and food security is more complex and was further explored using the primary data collected.

The level of education of the household head was also examined to see if less educated households were having more children. No significant differences were found.

The age of the household head was the final component considered among households with children. The average age of household heads in the surveyed counties is 49 years, but it is younger (45) for those with children compared to 53 for those without. As noted previously, food insecure households tend to be headed by older people (averaging 52 years).

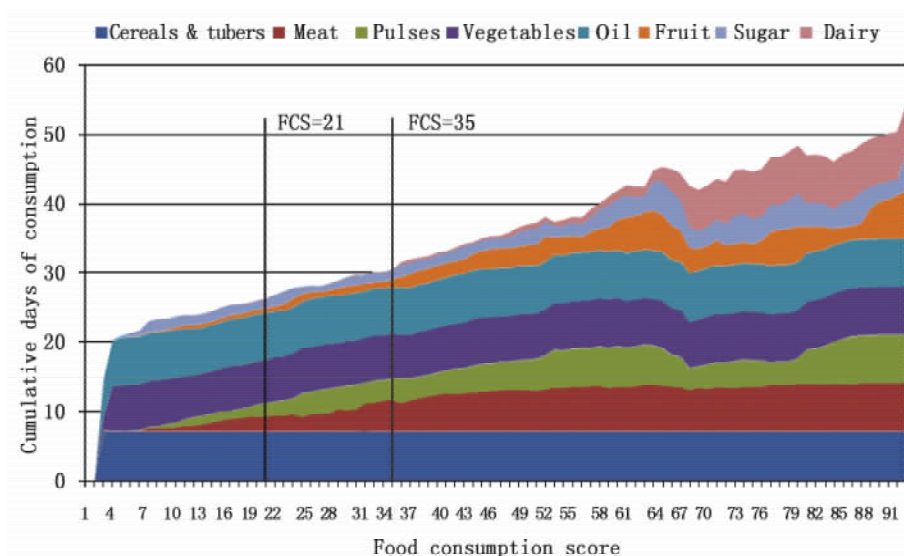
This finding is consistent with China's rapid economic growth and shows the generational change affecting household food security. Younger generations are wealthier with improved wealth and food security status.

4.4 Food consumption patterns

The Food Consumption Score (FCS) is derived from a module in the house-

hold questionnaire which examines the variety and frequency with which foods are consumed in the week before the survey. This module, in addition to providing a standard method of classifying food consumption groups, also allows for further examination of the diets of the population. Figure 17 below shows how the dietary diversity of households improves as their FCS improves.

Figure 17 Food consumption profiles change with increasing FCS



There is wide variation in the types of staple foods eaten by county. In Zhen'an, wheat and potatoes are eaten almost daily and meat consumption is fairly high. In Luonan, maize, wheat and potatoes are consumed almost daily but protein consumption is low, causing the lowest FCS.

In Wuding and Huize, rice is the staple and meat is eaten more than five days a week. Fruit consumption is highest here and pulses are eaten often as well.

In Panxian, rice is eaten nearly daily, while wheat and potatoes are often consumed too. Protein consumption is good with meat consumed more than four days a week and pulses almost five days a week.

Finally, in Zheng'an, rice consumption is daily and wheat and potatoes are eaten frequently. Meat consumption is moderately high at over four days per

week but pulses are consumed less than three days a week. In all of the counties, vegetables are consumed on an almost daily basis.

Table 12 Cumulative days of consumption of food groups per week

	White rice	Maize	Wheat	Potatoes, yam	Meat, fish, eggs	Pulses	Vegetables	Oil, butter	Fruit	Sugar	Dairy
Zhen'an	4.0	3.1	6.5	6.5	4.2	2.8	6.7	7.0	1.2	2.7	1.6
Luonan	1.6	6.4	6.9	6.3	2.3	1.5	6.7	6.9	1.1	3.3	1.4
Wuding	7.0	0.3	0.6	3.7	5.2	3.9	6.0	6.8	3.4	2.2	0.9
Huize	6.6	1.4	0.9	5.8	5.2	4.2	6.4	6.9	3.4	1.1	0.4
Panxian	6.7	1.8	4.0	4.0	4.3	4.8	6.8	6.8	1.8	0.8	0.3
Zheng'an	7.0	0.7	4.6	3.5	4.2	2.7	6.8	6.9	0.7	0.7	0.5
Total	5.9	2.1	3.6	4.8	4.3	3.7	6.6	6.9	2.0	1.4	0.7

4.5 Sources of food

How households obtain food is an important indicator of food access and can help identify which food sources are sustainable and which are not. Sources of food include: own production, cash purchase, a gift, credit purchase, hunting or gathering, bartering, direct government supply or borrowing. In fact, food across the surveyed counties is almost entirely bought with cash (50%) or home produced (47%), with little variation between counties.

The most notable difference in the sources of food is seen between wealth quintiles. As a household's education and skills base increases, it becomes wealthier by moving beyond agriculture, so the reliance on own production for sustenance appears to decrease.

Figure 18 Sources of food

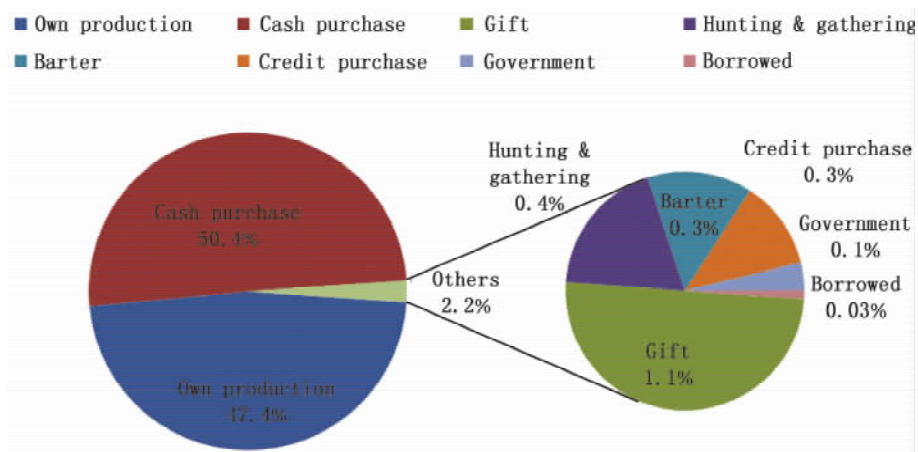
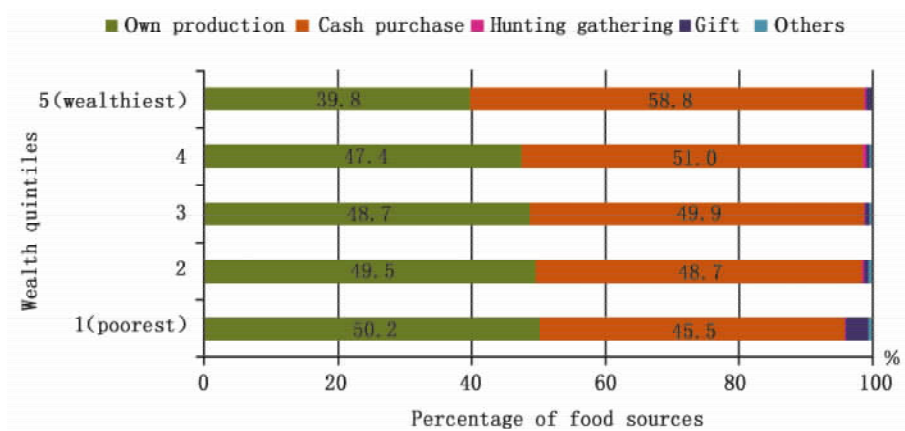


Figure 19 Food sources by wealth quintile



5 CAUSES OF FOOD INSECURITY

This section of the report examines the various causes of food insecurity. The causes are multiple (see conceptual framework for food security and nutrition analysis(Figure1))and may relate to any of the following:

- Natural events such as droughts or earthquakes
- Lack of structural assets such as roads, markets and accessibility to health care
- Lack of capital assets(wealth)or burden of disease

Food insecurity is often a dynamic interaction of all these factors and depends upon the intensity of exposure to these determinants coupled with the ability to cope.

Across the six counties, some common causes seem to exist. However, since the counties were selected purposively and are not necessarily parts of a whole,the analysis needs to be carried out county by county.

The poverty alleviation programmes of the Chinese government originally targeted poor counties by promoting general economic development,an objective that has had mixed poverty reduction results since non-poor and poor households do not necessarily benefit evenly.

Today many of the food insecure tend to be those households that have failed to benefit from the rapid economic growth of the country. They are the elderly households,the most burdened by ill health and the least endowed with resources. The results show that the food insecure households are:

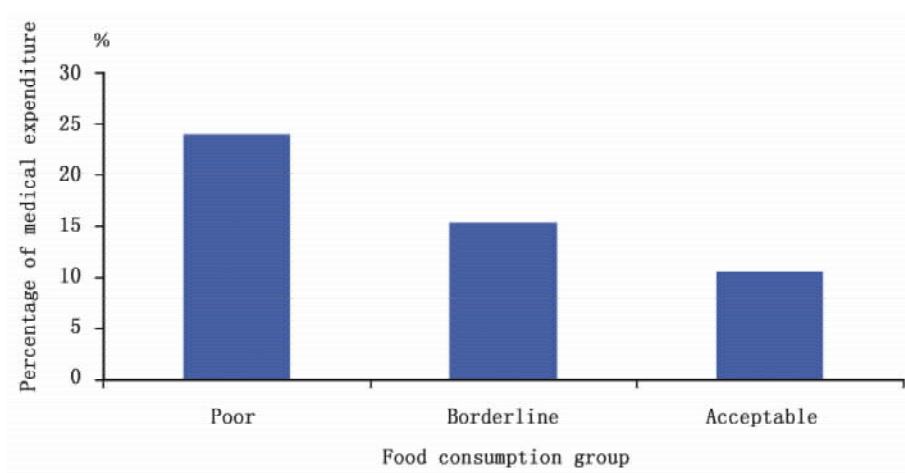
- Widowers(Panxian,Wuding,Huize)
- Those without improved sanitation
- Those with no or little livestock
- Elderly households
- Those which rely on unproductive/non-resilient agriculture
- Those lacking human capital—reflected in livelihoods and education

- Those with greater health care needs

In each of the counties and in rural China in general, migration and remittances are a key part of the household economy, particularly in Shaanxi province (Luonan and Zhen'an counties). Here households have had to be less dependent on agriculture/crop production as an income source (33% in Zhen'an and 36% in Luonan compared to 52% in total of the six counties) because they are historically drought-prone areas with poor access to irrigation (2% in Zhen'an and 5% in Luonan), so migration is a coping strategy. Households benefiting from remittances are generally more food secure than households not receiving substantial support from family outside the county.

Throughout the six counties households endure a heavy burden from medical expenses. There is a clear correlation between a household's food security status and its proportion of overall expenditure on medical expenses. For example in Panxian, food insecure households spend some 25% of their total expenditure on medical expenses compared to 11% in food secure households. This financial burden is also particularly high in Huize and Zhen'an. The burden of elderly members is also a likely contributing factor to the level of expenditure on medical expenses.

Figure 20 Household spending on medical expenses by FCG



The fact that mining is such a large employer of households in Panxian, attracting migrants from outside the county too, may play a role in this financial

burden since the industry, though profitable for the county, also has a detrimental effect on health. In 2007, the Chinese Center for Disease Control and Prevention (CCDC) reported that 77% of occupational related diseases were cases of pneumoconiosis¹, a lung disease associated with breathing in coal dust over extended periods of time.

There is a clear link between food insecurity and household's overall spending on medical fees. In the mining county of Pan food insecure households spend a quarter of total expenditure on health care.

And while the official number of deaths related to mining has decreased in recent years, China still accounts for 80% of the world's total mining deaths². Mining accidents and occupational disease are considered to be underreported by small private mines which avoid government regulations. While data does not exist directly on high medical expenditures due to mining related health issues, the high level of medical expenditures in Panxian coupled with the known presence of the mining industry cannot be ignored.

There is a significant positive correlation between food security and use of irrigation for agriculture. As noted above the majority of households in the six counties depend on rainfall for agriculture, but those with access to irrigation have improved outcomes in general, including food security. Irrigation can be considered a proxy for the level of agricultural development investment in the counties.

Usually, in rural households, a high proportion of household expenditure on food signals its vulnerability to food insecurity. This is the case in Huize and Wuding where the negative correlation between the share of food expenditure and the food consumption score seems to show that households that have to spend a higher proportion of their income on food have poorer diets. But interestingly, across the six counties there is no significant negative correlation between the proportion of overall expenditure on food and food insecurity. This may be explained by a generally low level of household spending in China and an increased propensity to save.

Generally households headed by the elderly, those relying on pensions

¹ CCDC, 2007 Report on the National Incidence of Occupational Diseases.

² China State Administration of Work Safety.

(government benefits because of retirement or disability) and those with a high elderly dependency ratio are more food insecure. In Huize, Panxian and Zheng'an counties households headed by the elderly are significantly more likely to be food insecure.

Some counties show a negative relationship between lack of education of the household head and food security, particularly in Huize. In Zheng'an the correlation relates to the spouse's education level and not that of the head while in Panxian, the correlation is between lack of education and food consumption, but not food security (not significant at $P < 0.05$).

The variations between counties are great enough to warrant addressing the main causes of food insecurity county by county.

5.1 Shaanxi province: Luonan and Zhen'an

Luonan has the highest prevalence of inadequate food consumption chiefly because of its low consumption of meat and high starch diet of wheat and potatoes.

Luonan has the highest prevalence of food insecurity (35.1%), defined by inadequate food consumption, among the six counties. One of the chief reasons for this is Luonan households' relatively low consumption of protein in the form of meat which they eat 2.3 days a week and pulses (including tofu) 1.5 days a week¹.

It has the lowest ownership and consumption of pigs, which are the most common livestock raised by rural households in China, and the smallest percentage of households classifying livestock and crop production as their main livelihood (11%). The underlying cause of the lack of pig ownership is unclear but the effect on household consumption of meat is very clear. Only households with acceptable food consumption reported consuming pork and 80% of that consumed is bought in local markets.

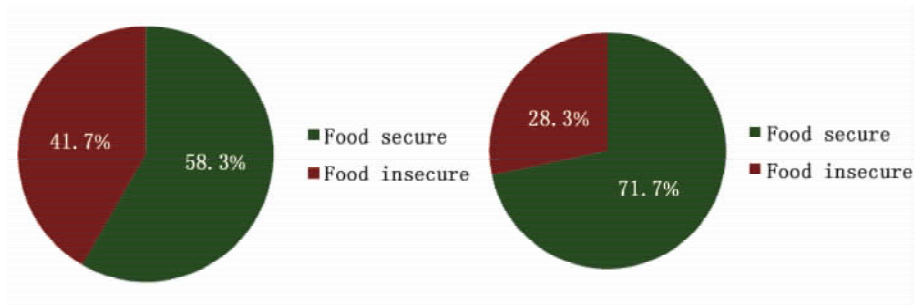
Households in Luonan have the lowest consumption of rice in the counties surveyed, eating it 1.6 days per week on average, but have a high starch diet of

¹ It should be noted that the FCS does not give weight to consumption more than once daily so that meals where potatoes and another starch are eaten together may be under-evaluated.

maize, wheat or potatoes, which are eaten on a daily basis and nearly all come from a household's own production. Maize is the chief crop (95.1%), mainly used for consumption (45%), for sale in markets (31.5%) and for fodder (23.4%).

The two counties have the highest percentage of households whose primary livelihood source is remittances from family members (28.5% for Luonan and 28.1% for Zhen'an) with almost half of all households receiving outside support. Luonan households are particularly dependent on them for guaranteeing household food security: 72% of those receiving remittances are food secure while 58% of households not receiving remittances are food secure as seen in Figure 21.

Figure 21 Luonan households not receiving remittances(left) and those receiving remittances(right)



Those not receiving remittances are mostly involved in particularly poor livelihoods; crop production (33%) followed by unskilled labour (21%). Sixty six percent of crop producers and 48% of unskilled labourers are in the two poorest wealth quintiles. These are also the two most food insecure livelihoods in Luonan with some 45% of crop producers and 43% of unskilled labourers food insecure.

Households with the relevant skills and opportunities to migrate and send remittances to their families will do so rather than struggle to find work and support their families with non-sustainable agricultural work or various forms of unskilled labour.

Having secured additional income for food expenditure (CNY 477 monthly in households where food consumption is acceptable vs. CNY 340 monthly in households where it is considered borderline) households in Luonan tend to

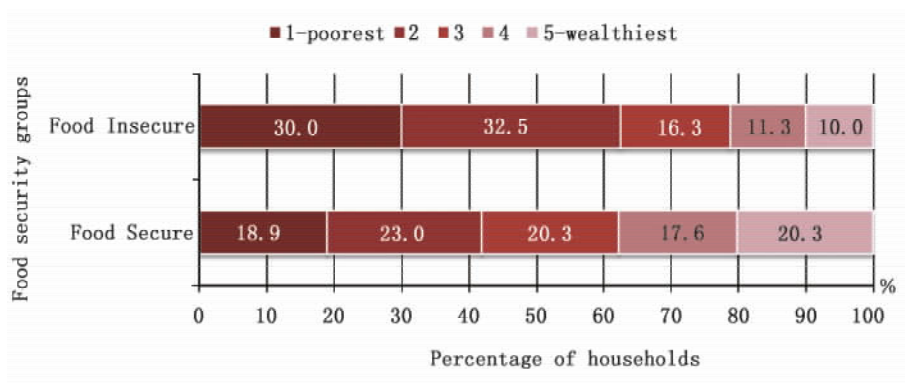
increase their spending on higher protein food such as pork and tofu.

In Luonan there is a significant negative correlation between the share of food derived from a household's own production and food consumption score (Pearson's correlation = -0.356), meaning households deriving food from self-consumption tend to eat worse. It could be interpreted that production for self-consumption is not sufficiently diversified, and those who are unable to purchase from the market tend to have poor diets.

As noted earlier there is a significant, strong correlation between child dependency and food security, which is particularly marked in Luonan. Seventy percent of food insecure households in the county have no children, compared with 48% of food secure households.

Luonan was ranked as the second poorest of the six counties with 51% of households in the two poorest wealth quintiles. While poverty is prevalent here, food insecure households are disproportionately poor as shown in Figure 22 below. More than 60% of the food insecure households are in the lowest two wealth quintiles.

Figure 22 Food insecure vs. food secure by wealth quintile in Luonan



With 18.4% of households defined as food insecure, Zhen'an in Shaanxi Province ranks as the third most food insecure of the six counties. It has a high starch diet similar to that of Luonan but with a greater consumption of rice and lower consumption of maize. Protein levels are higher with meat consumed on average 4.2 days a week, pulses 2.8 days a week and eggs (mainly from home reared hens) 2.7 days a week, which is more than any of the other counties.

Pig keeping is common: 75% of households with acceptable food consumption keep pigs (average of 2.5 animals) compared with 62% of borderline consumption households (average one pig). Some households with acceptable consumption also buy poultry (15.8%) and beef (8%). Zhen'an has the highest consumption of milk in the counties surveyed, consuming it on average 1.6 days per week.

In some extreme cases in Zhen'an households are spending nearly a third of total expenditure on medical expenses, which has forced them to cut their diet to a staple and oil.

Nearly all households with acceptable consumption buy their rice (97%) compared with 88% in the borderline consumption group in which 12% either barter for rice or receive it from family as a gift. Maize and wheat, like roots and tubers which are eaten nearly every day, are chiefly home produced.

Zhen'an and Luonan both reported a serious illness or accident involving a household member as the most frequent main shock (23.3% each). As discussed above all counties spend a large proportion of their household expenditure on medical expenses (11% average). In Zhen'an, there are several extreme cases of high spend (29% of total expenses) on medical care which has proved to be such a financial burden that households have had to reduce their diet to just a staple and oil.

This is further illustrated by the relationship between food consumption and the prevalence of households with an ill or injured member of working age whose condition prevents him/her from working: 26% of households with a member unable to work because of illness or injury are food insecure while 14% are food secure.

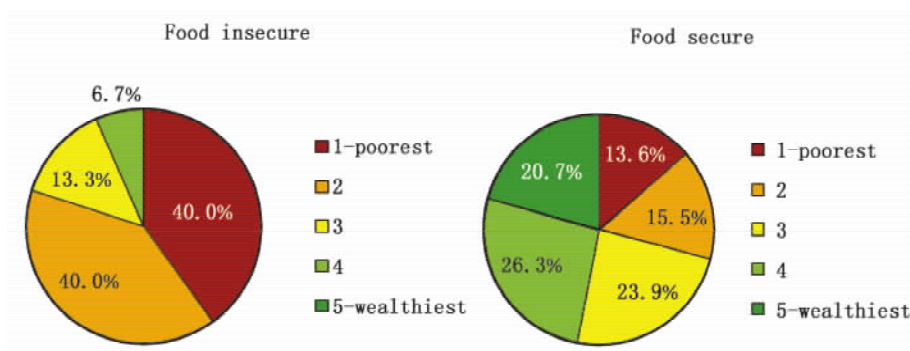
5.2 Yunnan province: Huize and Wuding

The two counties in Yunnan, Huize and Wuding, have comparatively low prevalence of food insecurity with 6.6% and 5.7% respectively. This makes it more difficult to ascertain the causes of food insecurity because many factors lose their statistical significance. However, in both counties, some correlations are significant and allow for interesting descriptions of the food insecure.

Poverty (as noted by the wealth index and wealth quintiles) is an obvious factor

affecting food insecurity. This relationship is particularly strong in Huize, where 80% of food insecure households are in the two poorest wealth quintiles.

Figure 23 Food insecure by wealth quintile in Huize(left)and food secure by wealth quintile in Huize(right)



Both counties are very much agrarian with 72% in Wuding and 73% in Huize classified as crop producers or livestock raisers. The livelihoods facing greatest food insecurity are pensioners, crop producers and unskilled labourers in Huize and unskilled labourers, crop producers and households engaged in livestock raising in Wuding¹.

The improved food consumption scores seen in Yunnan compared to the four counties in Shaanxi and Guizhou are driven primarily by higher meat intake. In Huize and Wuding, meat is consumed more than five days a week on average. The average diet in both counties is generally diverse with pulses consumed around four times a week and fruit more than three times (compared with less than twice in all other counties).

These are the highest pig owning counties with 80% of food secure households in Huize and 91% in Wuding owning an average of 4.5 pigs. Households are most likely to consume their home reared pigs (84% of households in Wuding and Huize source their pork from their own animals) and food secure households eat pork more than four days a week on average, showing how pig

¹ It should again be noted that 2010 was an abnormal year in terms of drought in Yunnan and the food security of crop and livestock producers may have been adversely affected.

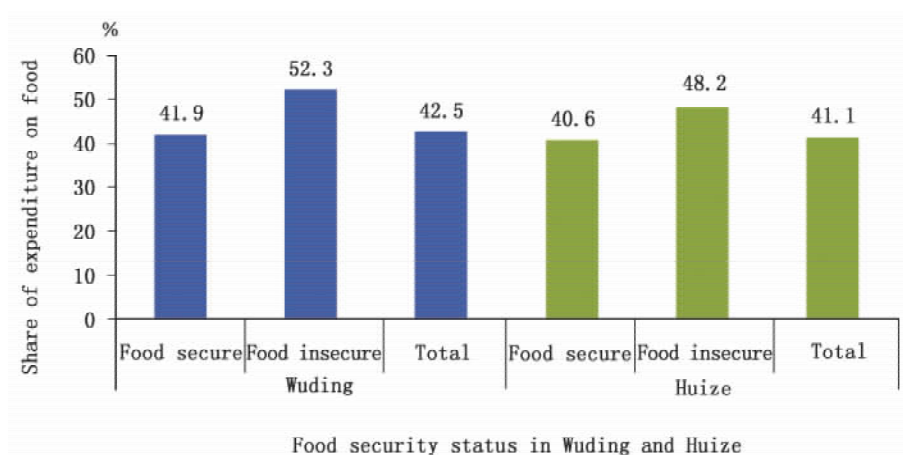
ownership increases meat intake, thereby making a positive contribution to food security. This is illustrated in Table 13 below¹.

Table 13 Pig ownership by food secure and insecure groups in Wuding and Huize

		Owns a pig (percentage)	Average number of pigs	Number of days pork was consumed in the past 7 days
Wuding	Food secure	90.7	4.2	4.6
	Food insecure	76.9	2.8	0.5
Huize	Food secure	79.8	5.2	4.7
	Food insecure	66.7	1.5	0.7

In Huize, younger households are reaping the advantages of a growing economy. The average age of the head of a food insecure household (56.5) is nearly seven years more than that of food secure households. This is further seen by the large share of food insecure pensioners in Huize—half of them fall into the food insecure category though they only represent 1% of the households.

Figure 24 Share of expenditure on food



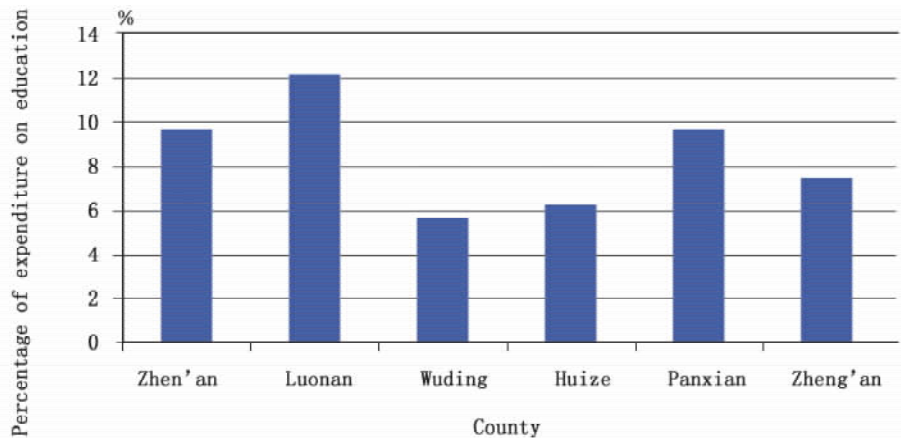
As mentioned earlier, the share of expenditure on food is often indicative of the financial stress a household endures and raises concerns regarding

¹ This should not be interpreted as a causality of food insecurity but rather a characteristic of households that are food secure.

vulnerability. Interestingly Yunnan is the only province where the relationship between a high share of food expenditure and food insecurity is significant i. e. food insecure households in both counties spend a higher proportion of their total expenditure on food than the food secure. Though the difference between the two groups is not statistically significant in Huize, it is to some degree in Wuding ($P < 0.10$).

With regard to non-food expenditure, it was observed that the absolute amount and share of spending on schooling in two counties of Yunnan is significantly lower than other counties. Further research is necessary to understand why and whether this will impact on the next generation's food security.

Figure 25 Share of expenditure on education



Interestingly, in Huize, migration and remittances do not have the same positive effect on household food security status that was observed in Shaanxi with 7.7% of remittance receivers food insecure compared with 6.6% overall in the county. This is likely due to a lack of adequate migration opportunities and low employment opportunities and pay for unskilled labour. For Wuding, it is slightly better, 3.8% of remittance receivers are food insecure compared to 5.7% overall in the county.

Medical expenses also impact significantly on food security in Huize where 18% of total household expenditure goes into medical care in food insecure households compared with 10% in the food secure. The reasons for this rela-

tively high spend are uncertain: at 9% the percentage of Huize households with at least one household member with an illness or injury that prevents them from working is comparable with the other counties. It may be that support of elderly family members or generally high costs of medical treatments in Huize are inflating the share.

5.3 Guizhou province: Panxian and Zheng'an

The two counties surveyed in Guizhou province, Panxian and Zheng'an, are in striking contrast with each other in terms of food insecurity. Zheng'an, with 18.9% food insecure, is the second worst off of all the six counties (after Luonan) while Panxian, which borders Yunnan Province, has a prevalence of 7%, more in keeping with Wuding and Huize.

In terms of per capita income Panxian is the wealthiest of the six counties based on statistical data. It has a large mining industry which attracts migrants and keeps emigration relatively low (14% migrate out from Panxian, compared with 20% nationally in rural areas). But medical expenses are a significant burden on households, seemingly because of the very high number of people who are unable to work due to illness or injury. Though the primary data collected does not give direct figures on the impact of different income activities on health, the relationship between the mining industry and poor health is difficult to dispute.

The high level of incapacitating disabilities from injuries and illness has a clear impact on household food security since it reduces a household's earning capacity at the same time as encumbering it with the burden of increased medical expenses. One in 10 households in Panxian has a member who is completely unable to work due to illness or disability. One in every four food insecure households in the county has an incapacitated family member.

The share of total expenditure on medical expenses in Panxian is generally high at 12%. But for the food insecure, it is an overwhelming burden, with more than one-quarter of total expenditures spent on medical expenses alone. With this high level of expenditure allocated to medical expenses, the overall budget of the household must be affected.

It is worth noting that in contrast to the usual trend of food insecure/poorer households spending proportionally more of their expenditure on food the

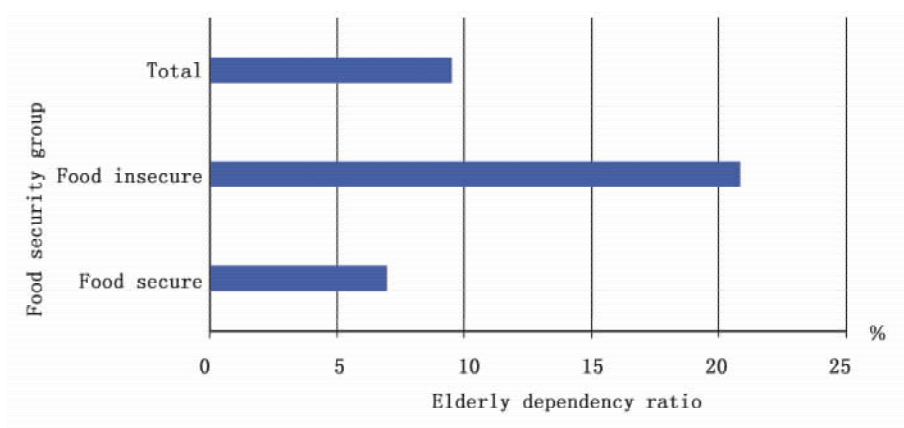
reverse is the case in Panxian, where food insecure households actually spend proportionally less on food than food secure households. This implies that households in Panxian are cutting their spending on food in order to pay for medical treatment.

Table 14 Share of expenditure on medical care and food
by food group in Panxian(percentage)

	Share of expenditure on medical expenses	Share of expenditure on food
Food secure	11.2	38.1
Food insecure	25.5	34.6
Total	12.2	37.8

In Zheng'an, an aging population with poor health, poor diets and weaker social protection as well as injuries or illness of working household members puts households in a vulnerable state.

Figure 26 Elderly dependency ratio in Zheng'an



Twenty-four percent of households in Zheng'an listed illness or injury of a working member as the main shock the household faced, the highest in the six counties (though Zhen'an and Luonan were closely behind). This directly affected the household's ability to earn its livelihood. On average, households in Zheng'an spent 13% of their expenditures on medical expenses rising to

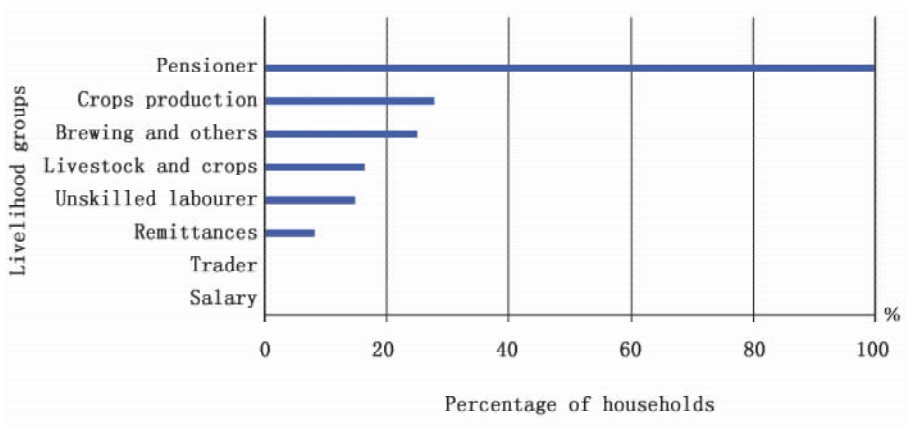
17% among the food insecure.

Zheng'an also has the highest proportion of households with at least one member temporarily unable to work(55%)for three months in the past year. This suggests injuries and illness are not necessarily permanently disabling working members, but are temporarily reducing the earning capability of the household.

In addition to the pressure of supporting temporarily ill or injured household members, the workers in food insecure households in Zheng'an often have to support aging family members. The elderly dependency ratio in the overall population is not particularly high at 9.5 (compared with 12.6 across all six counties) but among the food insecure, it rises sharply to 20.8. The difference between the food insecure and the food secure in terms of the elderly dependency ratio, coupled with the high expenditures on medical expenses, show that poor health in the ageing population has reduced food security in households in Zheng'an.

The food security status of the households is further analyzed by livelihoods in Zheng'an. Although only a small portion of the county's livelihoods consist of pensioners, they are a highly food insecure group and statistically significantly worse off than any other livelihood group. All (100%) of the households who were classified as pensioners are food insecure. Other affected livelihoods are crop producers(28% food insecure) and brewers(25%).

Figure 27 Percentage of food insecure by livelihood group in Zheng'an



While it seems that the government has correctly recognized the vulnerability of pensioners (thus their classification as such), there has not been adequate programming or policies to improve their food security.

In Zheng'an, there is also a statistically significant ($P < 0.05$) difference in the average age of the household head between food secure and food insecure households. At 48 years the average age of those heading food secure households is slightly lower than those heading food insecure households (51.4).

6 RECOMMENDED ACTIONS

The wide differences in causes of food insecurity between the counties show that interventions by policies or programmes must not be necessarily uniform. The shift in China's poverty alleviation programmes and development activities show recognition of this. Policy makers no longer target entire poor counties but are beginning to drill down to village and community level development programmes.

The education level of households head in Huize, households spouse in Zheng'an are particularly poor and are negatively impacting household food security. Improving access to affordable education is clearly an investment that would benefit all the counties. Given that tuition fees have been abolished, it is important to identify the other costs which pose a burden on poor families and finding ways to ensure children have access to the education needed to lift them out of poverty. This may include free school meal programmes in those places where education costs and food expenditure are high. Education programmes also need to be extended beyond children. Some of the most food insecure across the counties are unskilled labourers, who is often unable to gain income locally or outside the community. Give the mass migration to urban centres from rural areas, the importance of providing skills to potential migrants is clear.

Rural labour opportunities should not be neglected and improved education for farmers will help improve the productivity of farms and reduce migration which may not benefit individuals and households.

The share of household expenditure on medical expenses is very high across counties. In some counties, it is clearly reducing food security. The reason for these expenses seems to vary. In Guizhou (Panxian and Zheng'an), there appears to be a high level of injuries or illness affecting working age household members. In Zheng'an, elderly household members are in poor health and placing additional burdens on households. While the underlying causes of the medical expenses may be difficult to address, cost reduction of

medical expenses, particularly for vulnerable households, would have positive impacts on household food security.

In Shaanxi province, there is a large reliance on remittances and migration out of the county for household income. It appears that if households have successful migration experiences and can receive remittances, their food security status is good. But households which continue to depend upon crop production and those lacking adequate skills to seek employment elsewhere have very limited opportunities or resilience. Off-farm labour opportunities must be created and education and skills training for potential migrants are required.

Increased investments in rural development are also needed in Shaanxi where irrigation coverage is poor and the cost of inputs is high. In Luonan specifically, protein consumption is low and ownership of animals is the lowest in all of the six counties. While rearing animals is not a blanket solution, lending for purchase of animals or subsidizing the initial investments required may improve household food security.

In Yunnan, food security is generally not a major issue in the two counties surveyed. However, poverty is prevalent and the level of expenditure on food is relatively high. For future generations to prosper and to guarantee food security in a region that may face future uncertain events, such as the drought of 2010, more emphasis must be placed on disaster reduction.

7 ANNEX

ANNEX 1 METHODOLOGY

Annex 1-1 Sampling

The purpose of the survey was to describe the food security situation in six counties in China focusing on the proportion of food insecure households in each county. The sample universe was the population of the rural households across these six counties and the household was the unit of investigation. A two stage sampling method was used, first sampling villages from each county and then households from each selected village. Probability proportional to size sampling (PPS) was used in each stage.

The formula to calculate the sample size was

$$n = DEFF \times \frac{(Z_{\alpha/2})^2 \times [p \times (1 - p)]}{d^2}$$

n : calculated sample size;

$DEFF$: design effect;

$Z_{\alpha/2}$: threshold;

α : significance level;

$1 - \alpha$: confidence level;

p : estimated prevalence of food insecurity;

d : precision.

A response rate of 0.9 was used, under the assumption that not all the households would participate in the survey. This is to say that households in each county were oversampled by around 10%. Other technical indicators related to sampling include: 95% of confidence level, 50% of estimated prevalence of food insecurity, precision of 10% and a design effect of 2. The sample size was 214, we selected 12 households per village according to former survey experience, and sampled 19 villages in each county. So the actual sample size $n = 228$ for each county and the total sample size for 6 counties was $N = 1,368$.

Annex 1-2 Wealth index

Wealth is the value of all natural, physical and financial assets owned by a household, minus its liabilities. Measuring wealth is no simple task; the Wealth Index (WI) was used as a proxy indicator of household level wealth which is a composite index composed of key asset ownership variables. It covered housing and living facilities, productive assets, transport assets and household assets indicators.

The indicators selected should all be proxies capable of distinguishing relatively “rich” and relatively “poor”. Usually, the rule of thumb is “variables with a prevalence below 3%-5% or higher than 95%-97% should be excluded from the analysis as essentially everyone has or doesn’t have this indicator” (WFP). To create the wealth index, Principal Component Analysis (PCA) was run with all the selected variables, and variables that have low and non-significant correlation coefficients were removed. Finally, the principal component (first factor), (whether a household owns a car, motorcycle, mobile phone, rice cooker, CD or DVD player, washing machine and refrigerator, flush toilet, electricity for cooking and household living area), was taken to represent the household’s wealth. Five wealth quintiles were formed, namely, poorest, poor, middle, wealthy, and wealthiest. Though this method of analysis differs from other sections of the report where we do not focus on comparing the counties, it offered a method of analysis of poverty within counties using a standard definition of poverty.

The percentage of households owning a car and flush toilet is low at 4.8% and 7.0% respectively, even for the wealthiest group. Overall 15.5% own a refrigerator and 16.3% have electricity for cooking, but wide variation exists between the wealthiest and poorest households. While overall 50.8% own a CD or DVD player and 50.2% a washing machine there are major significant gaps between each quintile, rising to over 90% for the wealthiest and under 5% for the poorest.

Table A1 Asset ownership by wealth quintile(percentage)

Asset	Wealth quintiles				
	1(Poorest)	2	3(Middle)	4	5(Wealthiest)
Car	0	0.4	1.1	1.5	20.8
Motorcycle	1.8	22.4	30.9	54.8	69.0
Mobile phone	31.3	74.3	85.1	97.8	99.6
Rice cooker	29.8	71.0	89.5	96.7	97.4
CD or DVD	1.1	30.5	55.3	75.4	92.0
Washing machine	3.6	21.3	50.9	81.6	93.8
Refrigerator	0	1.1	4.0	8.8	63.5
Flush toilet	0.4	0.4	3.6	4.0	26.6
Electricity	2.5	9.2	10.2	16.9	42.7
Living area(m ²)	81.0	102.0	116.4	141.7	182.8

Annex 1-3 Livelihood groups

Livelihood groups were analysed to help understand the main livelihood patterns and how households with different livelihood strategies have varying food security status and are vulnerable to different types of shocks.

Each household stated their three main income earning activities for the past year(2009). The percentage of each activity was calculated according to their absolute income(the total percentage equals 100%). With cluster analysis, eight relatively homogenous livelihood groups were created using the percentage of the top three activities—crops production, livestock & crops, remittances(outside support), unskilled labourer, salary (employees, longer-term), trader(trade, commerce, shop keeper), pension(pension, disability benefit), brewing and others(brewing, fishing, rent and pay back)—based on the contributions of each livelihood activity.

Brewing was integrated with fishing and collection of aquatic animal resources other than fish because the total number of households relying on these livelihoods was so small(16 out of 1,368 households)and random.

Table A2 Final clusters of livelihood activities(percentage)

Livelihood activities	Clusters							
	Salary	Remittances	Brewing & others	Pension	Crops production	Trader	Unskilled labourer	Livestock & crops
Production of agricultural crops	12.2	16.6	8.9	16.3	67.2	11.6	20.8	28.1
Livestock rearing	6.2	5.0	2.7	4.8	17.8	7.4	10.6	38.7
Seasonal labour (agriculture)	0	1.3	0.2	0	1.3	0.1	0.1	4.7
Seasonal labour (non-agriculture)	1.8	1.5	4.4	0	2.8	1.3	60.8	1.9
Non-seasonal labour (agriculture)	0	0	0	0	0	0	0.3	0.9
Non-seasonal labour (non-agriculture)	0.1	1.2	1.3	0	0.8	1.6	0	9.0
Salaried	73.3	1.3	1.8	0	0.5	2.2	0.1	1.0
Handicrafts/Artisan	0.2	0.8	0	0	0.3	0.6	0	2.8
Forest Products	0	0.7	1.1	0.2	0.7	0	0.5	0.9
Petty trading	0.9	0	0.2	2.4	0.3	0.2	0	2.3
Trade,commerce	1.0	0.4	0	1.5	0.3	71.0	0.9	0.5
Remittances	2.7	66.3	2.5	6.9	3.5	2.5	3.1	4.1
Government allowance	0.2	0.9	0	66.2	0.8	0.9	0.2	0.3
Government subsidy	1.5	3.5	1.9	1.6	3.5	0.2	2.6	4.5
Others	0.1	0.5	75.0	0	0.3	0.5	0	0.4

Annex 1-4 Food consumption score

Households were asked about the food that they had consumed over the last seven days. The response for each of the foods on the list was simply the number of days. Each food group was given a score of 0 to 7, depending on the number of days it was eaten. The information gathered on dietary diversity and frequency of consumption was analysed by calculating the Food Consumption Score(FCS).

The FCS was calculated based on the diversity of the households' consumption of eight food groups. Every group was assigned a weight according to

the quality of nutrients that they bring to the diet. For every household involved in the survey, the FCS was calculated by multiplying each food group frequency by food group weight, then added together. FCS provides an indicator of food access. It should be pointed out that tofu, an important food in China, is classified in the pulses group, and the meat group includes pork, lamb, beef, poultry, fish and eggs.

Table A3 Food consumption score

Food item	Food group	Weight
Rice, wheat, potatoes and cassava	Cereals, tubers and root crops	2
Beans, peas, nuts and tofu	Pulses	3
Vegetables	Vegetables	1
Fruits	Fruit	1
Pork, beef, goat/sheep, poultry meat, eggs and fish	Meat and fish	4
Milk and other dairy	Milk	4
Sugar	Sugar	0.5
Edible oil	Oil	0.5

The maximum value of the FCS is 112, meaning that every food group was consumed every day for the last seven days. The calculated scores from the analysis are classified into three groups. According to WFP standards, a score of 0-21 indicates poor food security, a score of 21.5-35 indicates borderline food security and a score greater than 35 is considered an acceptable food security level. Poor and borderline groups are considered as food insecure.

ANNEX 2 BACKGROUND INFORMATION

Table A4 Background information on the six counties

County	Area (km ²)	Population (Thousand)	Rural proportion (%)	Households (%)	Rural households (%)	Per capita income (CNY)	Rank in NDKPCs
Panxian	4,056	1,170	86.3	350,102	82.1	2,383	215
Huize	5,884	960	90.6	270,032	83.8	2,326	236
Wuding	3,322	270	92.6	71,935	85.8	2,141	328
Zheng'an	2,595	610	93.4	151,505	85.4	2,073	364

continued

County	Area (km ²)	Population (Thousand)	Rural proportion (%)	Households (%)	Rural households (%)	Per capita income (CNY)	Rank in NDKPCs
Zhen'an	3,487	300	90.0	86,361	85.4	1,852	454
Luonan	2,830	450	84.4	133,116	78.3	1,844	457
Total/Av	22,174	3,760	89.6	1,063,051	83.1	2,103	

Source: China County Statistical Yearbook 2008.

ANNEX 3 DEMOGRAPHICS

Table A5 Average number of household members

Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
4.5	4.6	4.6	4.4	4.1	4.5	4.4

Table A6 Households with children(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Children under 5	26.8	29.4	29.0	22.4	18.4	21.5	22.6
Children 6-14	22.4	27.6	36.4	39.0	41.2	47.8	38.0
No children	43.4	50.0	55.3	54.0	52.6	61.8	53.4

Table A7 Gender of household head(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Male	87.3	88.6	83.8	89.5	86.4	91.7	88.1
Female	12.7	11.4	16.2	10.5	13.6	8.3	11.9

Note: Household head refers to the person who usually makes most of the main decisions in the household.

Table A8 Age of household head(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
18 to 59	82.0	79.0	87.3	79.0	78.1	82.5	80.0
60 and above	18.0	21.1	12.7	21.1	21.9	17.5	20.0

Table A9 Marital status of household head(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Married	91.2	90.4	93.4	94.7	93.4	92.1	93.0
Divorced	0.9	0.4	1.3	0.4	0	0.9	0.4
Other	7.9	9.2	5.3	4.8	6.6	6.9	6.5

Table A10 Villages with health services(percentage)

Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
36.8	42.1	94.7	89.5	79.0	68.4	73.8

Table A11 Most frequently used health services(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Health center	52.6	47.4	100.0	84.2	68.4	73.7	71.3
Pharmacy	10.5	0	0	5.3	5.3	5.3	4.6
Mobile clinic	5.3	0	0	0	0	0	0.4
Private clinic	31.6	47.4	0	5.3	26.3	15.8	20.9
Village health care worker (nurse)	0	5.3	0	0	0	0	0.7
Traditional village doctor	0	0	0	5.3	0	5.3	2.1

Table A12 Households with a chronically sick member(percentage)

Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
54.4	45.2	40.8	45.6	50.4	54.8	48.9

Table A13 Position of chronically sick household member(percentage)

	Household head	Spouse	Others
Zhen'an	45.1	36.3	18.7
Luonan	42.9	48.8	8.3
Wuding	42.5	34.2	23.3
Huize	33.7	61.8	4.5
Panxian	42.9	49.0	8.2
Zheng'an	41.8	50.0	8.2
Average	40.6	50.3	9.2

ANNEX 4 MIGRATION AND REMITTANCES

Figure A1 Migrants by age group

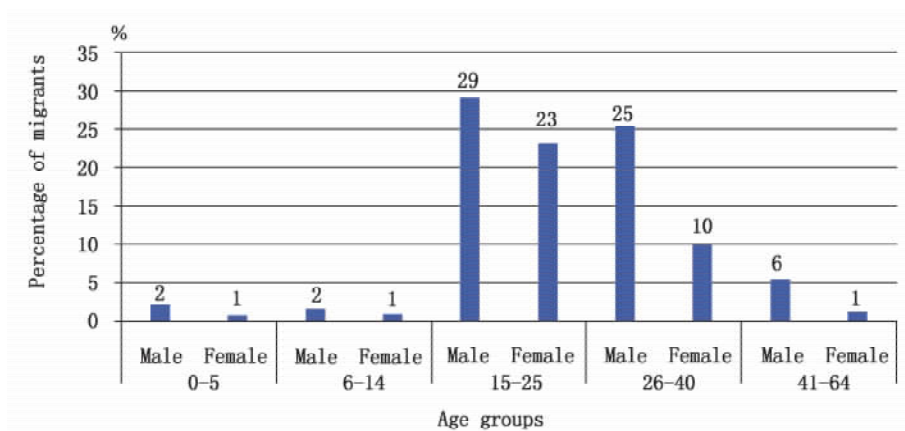


Figure A2 Migration calendar

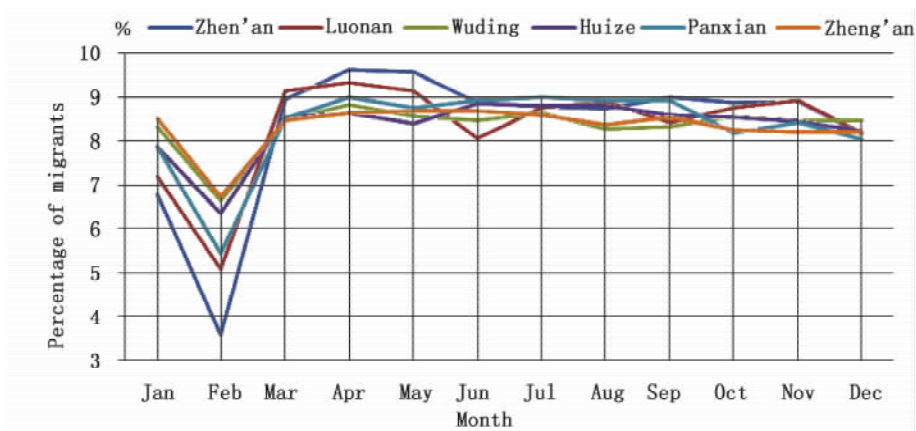


Figure A3 Migration reasons

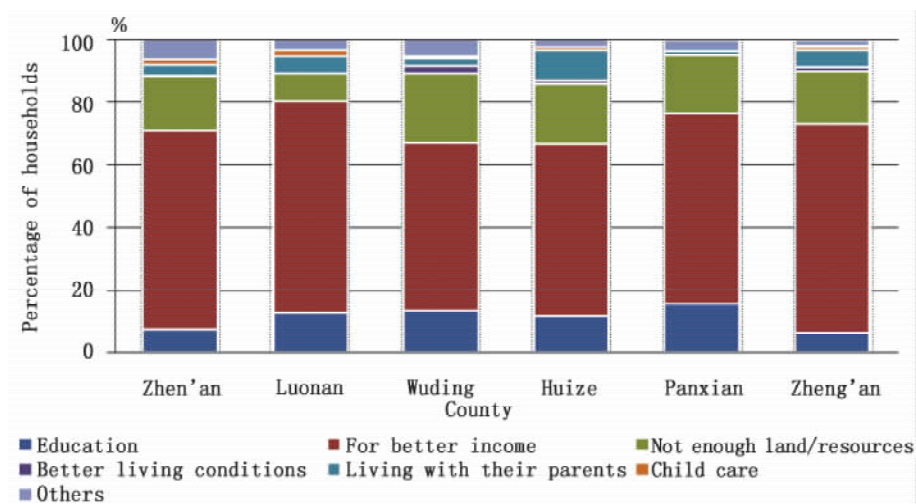


Table A14 Households receiving money or support from outside members

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	47.4	49.6	32.0	30.3	24.6	30.3	32.4

Table A15 Amount of support received in the past year(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
1-500 CNY	9.3	4.4	17.8	18.8	21.4	5.8	13.7
501-1,000 CNY	8.3	8.8	8.2	17.4	16.1	8.7	12.4
1,001-2,000 CNY	12.0	8.8	12.3	27.5	12.5	21.7	16.7
2,001-3,000 CNY	7.4	4.4	16.4	4.3	8.9	21.7	9.2
3,001-4,000 CNY	3.7	6.2	2.7	4.3	10.7	5.8	6.3
Above 4,000 CNY	59.3	67.3	42.5	27.5	30.4	36.2	41.7

Table A16 Households expecting to receive money in the next year

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	88.0	95.6	84.9	92.8	83.9	85.5	88.9

ANNEX 5 HOUSEHOLD ASSETS

Table A17 Households renting, owning or living for free(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Own	98.3	99.1	99.1	98.7	95.6	98.7	97.7
Don't own but live for free	0.4	0.4	0.4	1.3	4.0	0	1.8
Pay rent	1.3	0.4	0.4	0	0.4	1.3	0.5

Table A18 Average number of household members per room

Average	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
1.3	1.0	1.1	1.3	1.7	2.1	1.5

Table A19 Households with improved and unimproved wall material(percentage)

		Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Improved	Steel	0	0	0	0.4	0	0.4	0.2
	Steel and reinforced	1.8	0.9	4.8	4.4	4.0	9.2	4.3
	Reinforced concrete	23.3	53.1	14.0	15.8	32.0	29.0	28.3
	Brick	4.4	17.5	6.1	18.4	14.9	21.5	15.6
Unimproved	Wood	0.9	0.4	0.9	0.9	13.2	30.7	9.1
	Bamboo	0	0	0	0.9	1.3	1.3	0.8
	Earth	68.0	28.1	73.3	57.0	7.9	5.3	31.8
	Others	1.8	0	0.9	2.2	26.8	2.6	10.0

Table A20 Households with improved and unimproved roof structure(percentage)

		Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Improved	Steel	0.9	0	0	0.9	0.4	0	0.4
	Steel and reinforced	16.2	16.7	11	11.8	29.0	30.7	21.1
	Tile	79.0	82.0	88.6	86.4	68.0	68.4	76.8

continued

		Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Unimproved	Bamboo	0.4	0	0	0	0.4	0	0.2
	Grass	0	0	0	0.4	0	0	0.1
	Others	3.5	1.3	0.4	0.4	2.2	0.9	1.4

Figure A4 Water availability

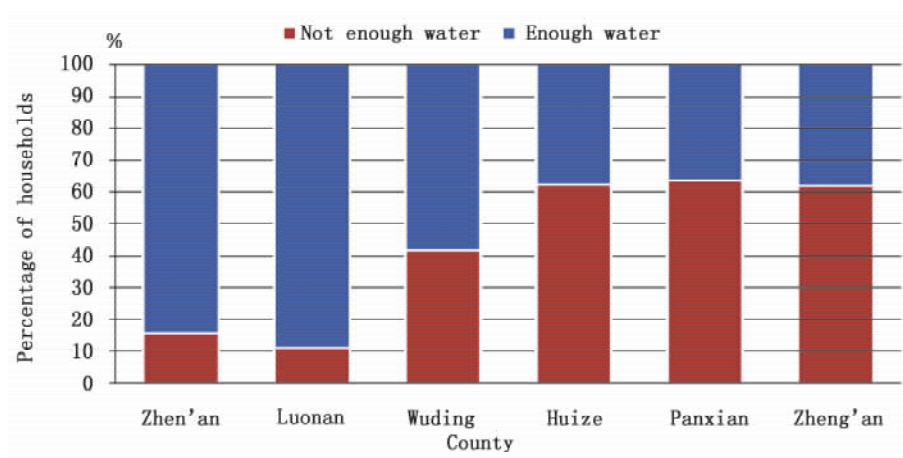


Figure A5 Calendar of water shortages by month

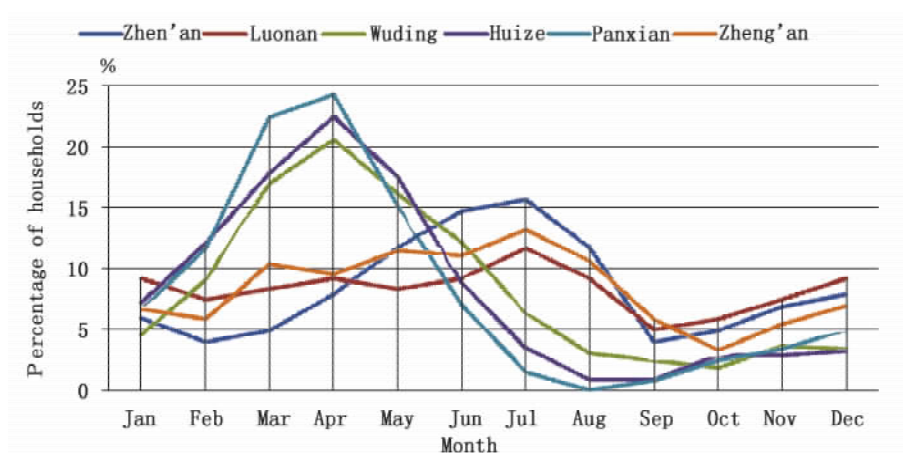


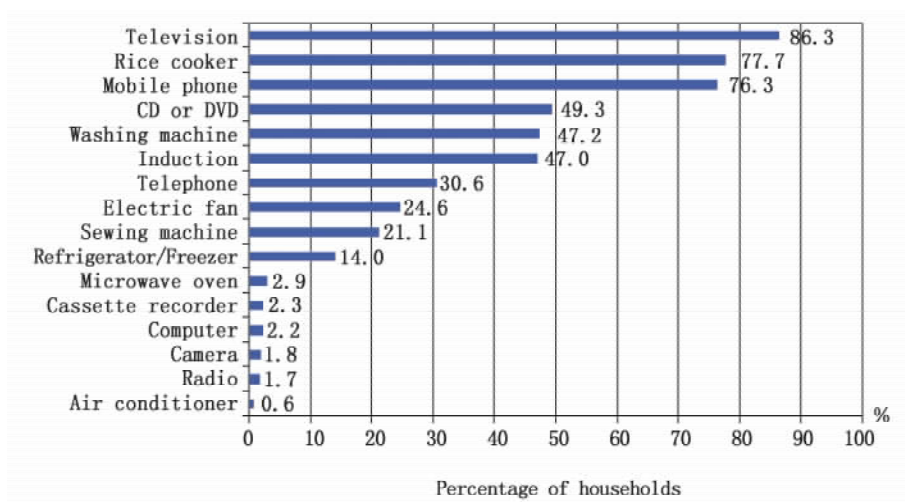
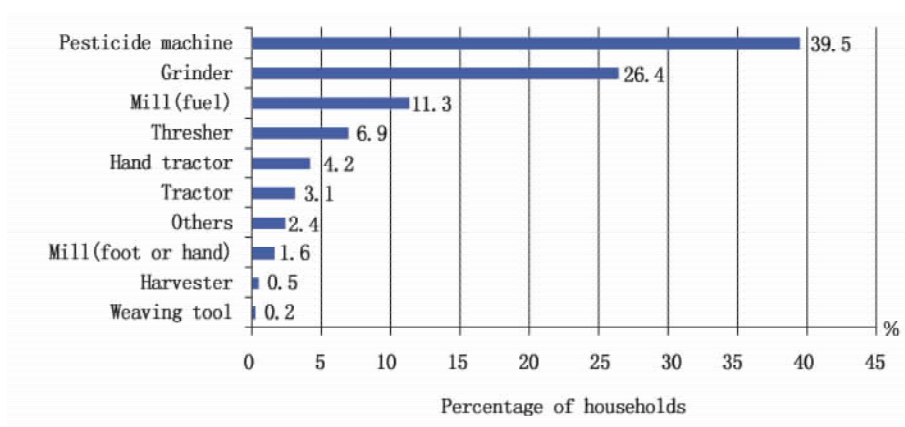
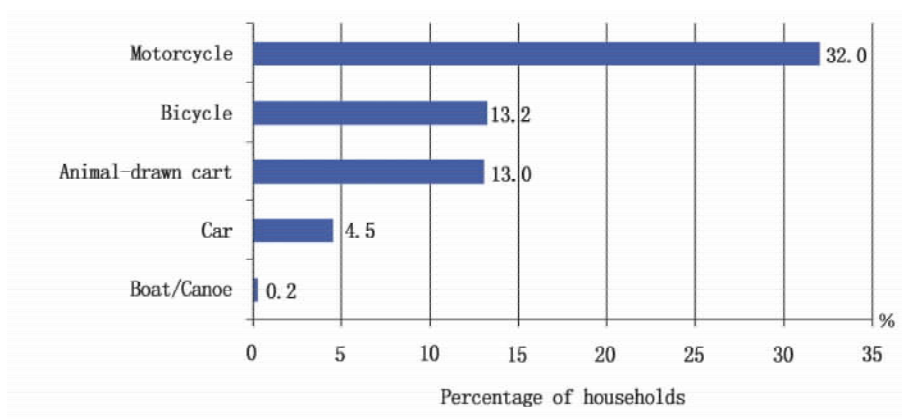
Figure A6 Household ownership of selected assets**Figure A7 Household ownership of selected productive assets**

Figure A8 Household ownership of selected transport assets**Table A21 Age of household head by wealth quintile(percentage)**

	1(Poorest)	2	3(Middle)	4	5(Wealthiest)
Household head under 30	0	10.3	20.7	31.0	37.9
Household head 30-39	9.0	18.7	25.5	19.9	27.0
Household head 40-49	14.7	19.2	19.7	23.7	22.6
Household head 50-59	20.3	20.9	18.8	21.5	18.5
Household head above 60	41.6	22.3	16.4	10.9	8.8

Table A22 Education level of Household head by wealth quintile(percentage)

	1(Poorest)	2	3(Middle)	4	5(Wealthiest)
No education	42.7	22.0	13.8	14.6	6.9
Middle education	16.0	20.2	22.2	20.5	21.1
High education	4.7	11.8	10.6	29.4	43.5

Table A23 Households with or without children under 5 by wealth quintile(percentage)

	1(Poorest)	2	3(Middle)	4	5(Wealthiest)
No children under 5	23.6	20.9	19.4	18.2	17.9
With children under 5	7.7	16.8	21.9	26.1	27.4

Table A24 Credit by source(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Relatives/friends	42.8	58.2	49.6	48.6	56.6	51.5	71.2
Charities/NGOs	0.9	0	0.3	0	0.3	0	0.4
Local lender	0.6	0	0	0.3	5.6	1.6	1.8
Bank	8.8	2.6	6.2	4.6	2.8	6.2	7.4
Cooperative bank	31.9	28.6	33.7	37.5	21.7	29.3	42.8
Village head	3.5	2.3	3.5	0.9	0.7	0.3	2.7
Company/middle men	0	0.3	0.6	0.3	0	1.6	0.7
No access to credit	11.5	8.0	6.2	7.7	12.2	9.4	12.7

Table A25 Households with loans

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	64.0	64.5	56.6	73.2	73.7	73.2	70.4

Table A26 Households can't pay back loans

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	61.0	63.9	39.5	50.9	42.3	41.3	48.1

Note: "Can't repay" means unable to pay back in the next two or three years.

Table A27 Proportion of debt in annual income(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
<25%	7.6	10.2	14.7	6.6	7.1	9.0	8.1
25%-49%	12.4	8.8	14.7	8.4	12.5	15.6	11.5
50%-74%	9.7	4.8	8.5	7.2	7.1	9.6	7.5
75%-100%	10.3	12.2	14.7	13.2	17.9	13.8	14.7
>100%	60.0	63.9	47.3	64.7	55.4	52.1	58.2

Table A28 Reason for debt(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Education	17.3	23.8	14.6	13.7	17.8	17.1	20.9
Wedding or funeral	7.3	7.6	5.8	6.0	5.8	3.6	7.2
Illness	24.0	24.3	24.8	18.0	24.9	32.1	29.3
Housing, house improvement	39.1	32.4	28.5	28.4	24.0	23.3	33.1
Agricultural inputs	2.2	1.6	13.9	14.2	15.1	5.7	13.3
Food purchase	3.4	0.5	2.2	2.2	3.6	5.2	3.7
Non-food purchase	1.7	2.2	2.9	4.4	4.0	4.7	4.6
Others	5.0	7.6	7.3	13.1	4.9	8.3	9.5

Table A29 Villages with primary school

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	52.6	79.0	100	100	63.2	94.7	81.6

Note: Although the majority of villages have a primary school, some are unused, as sometimes there aren't enough pupils to support a school, so students have to travel to a neighbouring village or town. For those villages without a functioning elementary school, the pupils have to walk an average of four kilometres to get to school, with the distance as much as seven kilometres in Zheng'an. The majority of pupils (66.7%) in villages without elementary schools walk to school, while others use private vehicles or just board at school during the week (28.6%).

Table A30 Villages with food market

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	15.8	15.8	26.3	26.3	21.1	31.6	22.8

Note: Most villages in the sampled area have no regular food market. But there are always regular food markets in the nearby town or village. For the villages without a regular food market, people have to travel an average of 7.4 kilometers to get to the nearest one. Those in Wuding and Zheng'an have to travel much further (about 10 km), while farmers in Panxian only have to travel 5.1 kilometers. Almost all the villages have at least one grocery shop and street vendors are present in more than 60% of the sampled villages.

ANNEX 6 AGRICULTURE

Table A31 Agricultural land holdings

	MeanHousehold (Mu)	Mean per capita (Mu)	number of land	Time walk to the farthest land(Min)
Panxian	2.9	0.7	11.8	48.7
Luonan	3.7	0.9	5.9	26.5
Zheng'an	3.7	0.9	8.3	30.6
Zhen'an	3.9	1.0	13.1	42.2
Wuding	5.5	1.2	10.1	29.2
Huize	5.6	1.4	11.7	36.2
Average	4.1	1.0	10.5	38.1

Note: 1 mu=1/15 hectare

Table A32 Agricultural water sources(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Rain water	98.1	95.2	54.0	80.0	94.2	92.9	87.8
Irrigated- canals/dam	0.5	2.6	27.0	9.3	3.9	0.5	6.1
Irrigated-pump	0.5	0.4	0	1.3	0	0	0.5
Irrigated-river	1.0	1.8	8.4	9.3	1.9	5.2	4.7
Others	0	0	10.6	0	0	1.4	1.0

Table A33 Main crops(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
White rice	0	0	30.5	7.8	13.1	36.1	13.3
Wheat	5.0	0	0.5	0	0	0	0.4
Maize	83.7	95.1	55.0	61.6	73.3	50.7	69.4
Soybean	4.5	0.4	0	0	0	0	0.4
Beans	0.5	0	0.5	0	0	0	0
Cassava	0	0	0	0.5	0	0	0
Potatoes	2.0	0	0.5	21.5	3.4	1.0	7.1
Vegetables	0.5	0.4	0.9	2.7	0.5	4.9	1.7
Fruits	0	0	0	1.4	0	0	0.4
Tobacco	2.0	3.6	10.9	2.3	6.8	2.9	4.6

continued

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Groundnuts and other nuts	1.0	0	0.5	0	0	0	0.1
Rapeseed	0	0	0	0.5	0	0	0.2
Nuts	1.0	0.4	0	0	0	0	0.2
Others	0	0	0.9	1.8	2.9	4.4	2.1

Table A34 Use of white rice(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	0	100.0	93.6	89.7	91.7	91.1	90.9
Fodder(own livestock)	0	0	1.4	0	5.0	2.2	2.8
Sale in market	0	0	5.0	7.7	0	1.5	2.8
Loss of crop	0	0	0	2.6	0	3.7	1.7
Not applicable	0	0	0	0	3.3	1.5	1.7

Table A35 Use of maize(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	56.0	44.6	5.0	15.1	27.8	9.1	25.5
Fodder(own livestock)	41.9	23.4	83.0	77.3	69.3	83.3	65.2
Sale in market	0.5	31.5	8.5	7.0	2.9	2.7	8.0
Loss of crop	0	0	1.5	0.6	0	4.8	0.9
Not applicable	1.6	0.5	2.0	0	0	0	0.3

Table A36 Use of wheat(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	88.2	100.0	36.4	0	66.7	0	45.5
Fodder(own livestock)	5.9	0	36.4	71.4	0	100.0	33.3
Sale in market	5.9	0	27.2	14.3	0	0	9.1
Not applicable	0	0	0	14.3	33.3	0	12.1

Table A37 Use of potatoes(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	94.1	87.8	77.8	51.0	76.0	52.2	62.7
Fodder(own livestock)	2.9	2.4	16.7	19.7	17.3	44.8	20.2
Sale in market	2.9	9.8	5.6	28.7	1.3	0	14.8
Loss of crop	0	0	0	0.6	1.3	3.0	1.2
Not applicable	0	0	0	0	4.0	0	1.2

Table A38 Use of soybean(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	72.2	43.1	74.1	95.5	94.6	66.7	72.2
Fodder(own livestock)	10.3	6.9	0	4.5	0	16.7	5.0
Sale in market	12.4	49.3	18.5	0	1.8	16.7	20.2
Not applicable	5.2	0.7	7.4	0	3.6	0	2.5

Table A39 Use of vegetables(percentage)

Mostly for	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Household consumption	87.5	90.3	87.2	33.3	93.1	96.2	75.7
Fodder(own livestock)	0	0	0	16.7	0	0	4.6
Sale in market	12.5	6.5	12.8	50.0	3.4	3.8	17.9
Not applicable	0	3.2	0	0	3.4	0	1.7

Table A40 Sources of seed for white rice(percentage)

	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Purchase	100.0	87.1	97.4	78.3	98.5	89.5
Own stock	0	8.6	0	20.0	0.7	8.5
Government	0	0.7	0	0	0	0
Purchase and own stock	0	1.4	0	1.7	0	0.8
Borrow/exchange	0	0.7	2.6	0	0	0.6
Shared from neighbours/relatives	0	1.4	0	0	0.7	0.6

Table A41 Sources of seed for maize(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Purchase	93.7	98.6	94.5	93.6	74.6	95.2	87.9
Own stock	6.3	0.5	2.5	4.7	22.0	4.3	10.0
Government	0	0.5	2.0	1.2	3.4	0	1.7
Purchase and own stock	0	0	0	0	0	0.5	0.1
Borrow/exchange	0	0	0.5	0	0	0	0
Shared from neighbours/relatives	0	0	0	0.6	0	0	0.2
Government subsidized	0	0	0.5	0	0	0	0

Table A42 Sources of seed for wheat(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Purchase	88.2	45.5	28.6	66.7	100.0	66.7	59.4
Own stock	11.8	54.5	71.4	33.3	0	33.3	40.6

Table A43 Sources of seed for potato(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Purchase	64.7	80.5	50.0	36.3	45.3	22.4	41.5
Own stock	32.4	19.5	38.9	61.1	48.0	77.6	55.1
Government	0	0	0	0.6	5.3	0	2.0
Purchase and own stock	2.9	0	5.6	1.9	0	0	1.0
Borrow/exchange	0	0	5.6	0	0	0	0
Shared from neighbours/relatives	0	0	0	0	1.3	0	0.4

Table A44 Methods of storing crop harvest(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Indoors—in basket or barrel	17.4	17.6	32.0	18.8	15.9	22.6	19.2
Indoors—in bags	0.6	0	8.9	17.0	7.6	11.3	8.8
Indoors—open storage	82.0	72.1	56.7	61.8	75.2	64.3	68.9
Storage hut	0	0	1.5	0	1.4	1.2	0.7
Inside house in storage room	0	0	0	0.6	0	0	0.2
In rice bank/communal storage	0	10.3	1.0	1.8	0	0.6	2.3

Table A45 Farming tools used to cultivate/harvest(percentage)

Farming tools	Cultivation	Harvest
Hand tools	14.3	99.2
Horse/ox/buffalo plough	79.0	0.6
Hand tractor	6.4	0.2
Big tractor	0.3	0

Table A46 Types of fertilizers used(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
Chemical fertilizers only	20.6	46.2	5.3	0.5	2.9	5.3	9.8
Natural fertilizers only	8.3	0.4	2.2	0.5	0.5	3.9	1.7
Both chemical and natural fertilizers	67.2	50.2	73.3	85.4	89.3	86.9	80.0
Chemical fertilizers and micronutrient enriched	0.5	1.4	1.3	0	0	0	0.2
Chemical fertilizers, natural fertilizers and micronutrient enriched	3.4	1.8	17.3	13.6	7.3	3.9	8.2
None	0	0	0.4	0	0	0	0

Table A47 Households with a kitchen garden

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	47.4	31.1	62.3	62.7	69.7	80.7	62.4

Table A48 Households raising farm animals

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an	Average
%	83.3	66.7	98.2	92.5	89.9	84.6	86.9

ANNEX 7 INCOME AND INCOME SOURCES

Figure A9 Main three income sources

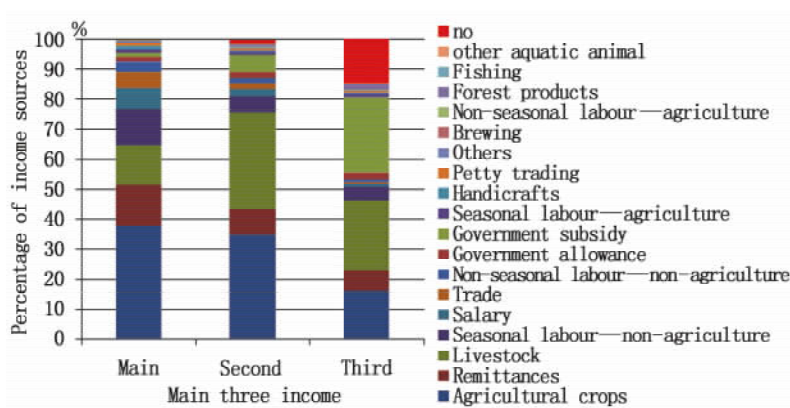


Figure A10 Contributions to income by livelihood activity

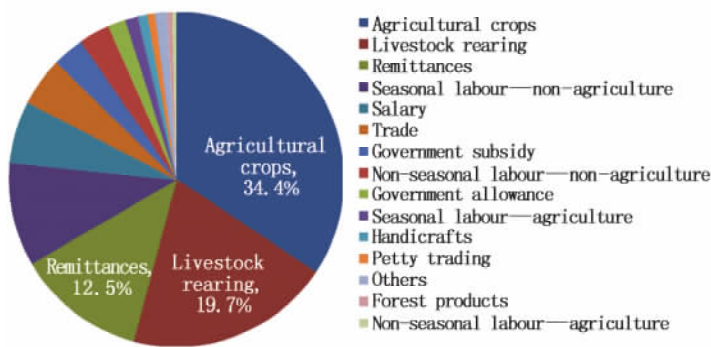


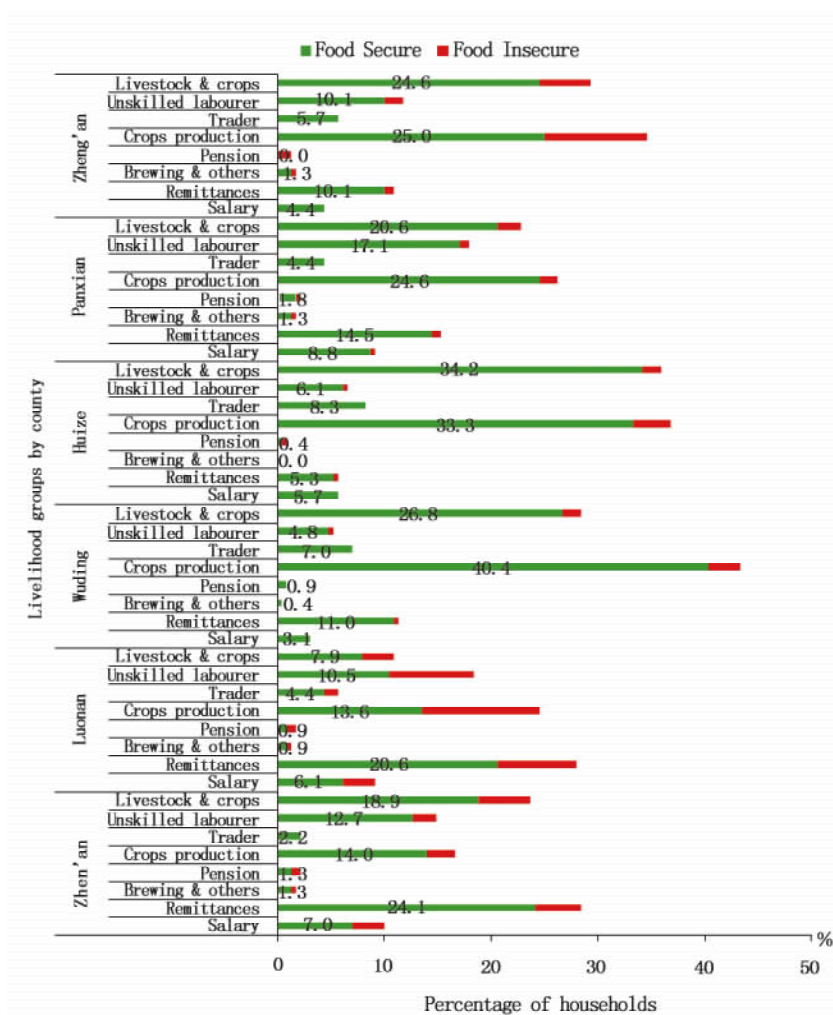
Table A49 Livelihood groups(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Crops production	16.7	24.6	43.4	36.8	26.3	34.6
Livestock & crops	23.7	11.0	28.5	36.0	22.8	29.4
Remittances	28.5	28.1	11.4	5.7	15.4	11.0
Unskilled labourer	14.9	18.4	5.3	6.6	18.0	11.8
Salary	10.1	9.2	3.1	5.7	9.2	4.4

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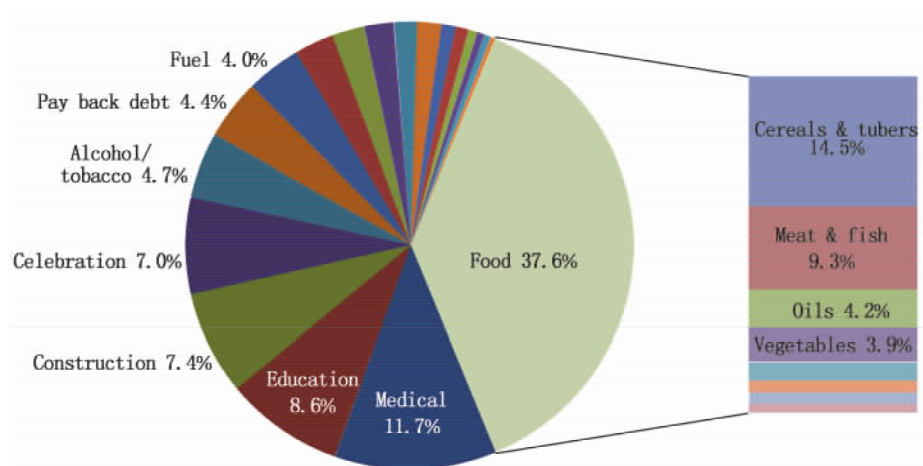
	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Trader	2.2	5.7	7.0	8.3	4.4	5.7
Pension	2.2	1.8	0.9	0.9	2.2	1.3
Brewing & others	1.8	1.3	0.4	0	1.8	1.8

Figure A11 Livelihood groups' food security situation



ANNEX 8 EXPENDITURE

Figure A12 Average monthly food and non-food expenditure



**Table A50 Food as a proportion of total expenditure
by wealth quintile(percentage)**

Wealth index	1 (Poorest)	2	3 (Middle)	4	5 (Wealthiest)
Food as proportion of expenditure	45.7	40.9	35.9	33.0	32.5

**Table A51 Food as a proportion of total expenditure
by livelihood group(percentage)**

	Food percentage quintiles				
	1 (Lowest percentage spent on food)	2	3	4	5 (Highest percentage spent on food)
Crops production	12.2	21.8	18.4	25.2	22.4
Livestock & crops	18.5	14.3	22.5	20.7	24.1
Remittances	28.6	23.8	17.0	15.2	15.3
Unskilled labourer	17.6	20.2	23.2	18.9	20.1

continued

	Food percentage quintiles				
	1 (Lowest percentage spent on food)	2	3	4	5 (Highest percentage spent on food)
Salary	20.2	23.6	21.4	24.2	10.5
Trader	45.0	20.9	21.5	4.3	8.3
Pension	15.4	17.0	16.0	14.4	37.2
Brewing & others	48.9	34.0	4.7	0	12.4

Note: The percentage of food expenditure in one month is calculated, and five food expenditure percentage quintiles are formed, namely, least (with the least percentage of food expenditure), less, middle, more, and most.

ANNEX 9 FOOD SECURITY

Figure A13 Overall food security situation in 6 counties

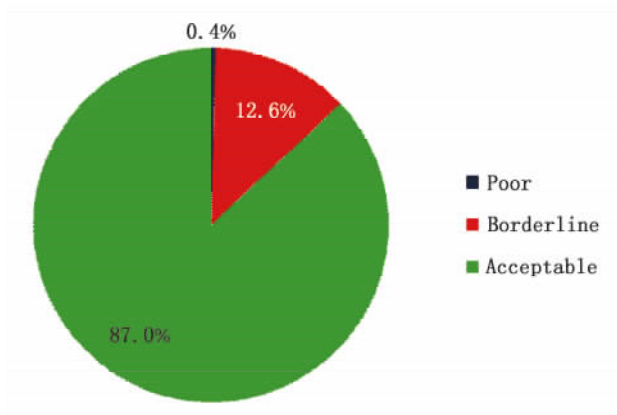


Table A52 Food consumption by food group

	Weekly food consumption frequency(days per week)								Mean FCS
	Staples	Meat	Milk	Pulses	Vegetables	Oil	Fruits	Sugar	
Zhen'an	7	4.2	1.6	2.8	6.7	7.0	1.2	2.7	58.3
Luonan	7	2.3	1.4	1.5	6.7	7.0	1.1	3.3	46.3
Wuding	7	5.2	0.9	3.9	5.8	6.8	3.4	2.2	63.6

continued

	Weekly food consumption frequency(days per week)								Mean FCS
	Staples	Meat	Milk	Pulses	Vegetables	Oil	Fruits	Sugar	
Huize	7	5.2	0.4	4.2	6.4	6.9	3.4	1.1	62.9
Panxian	7	4.3	0.3	4.8	6.8	7.0	3.7	0.8	59.2
Zheng'an	7	4.2	0.5	2.7	6.8	6.9	0.7	0.7	52.2

Figure A14 Food consumption of sample households

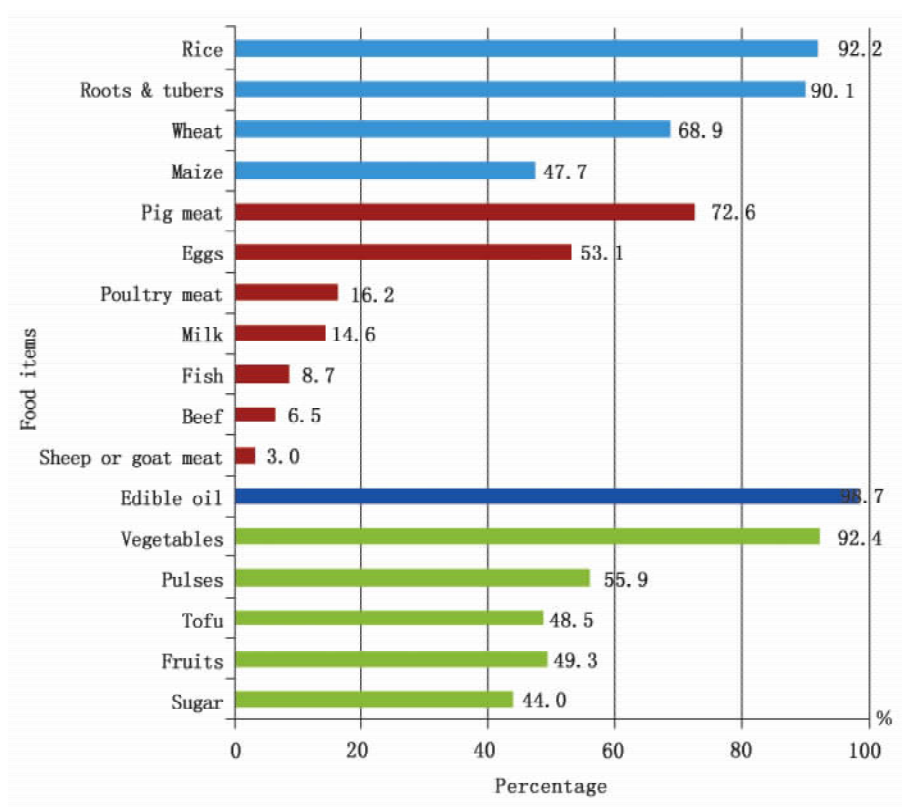


Figure A15 Number of meals per day by FCG

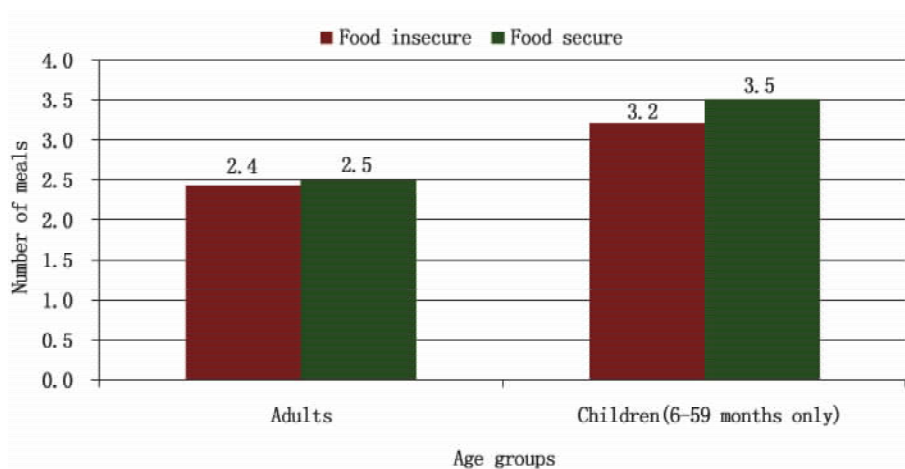


Figure A16 Number of meals per day

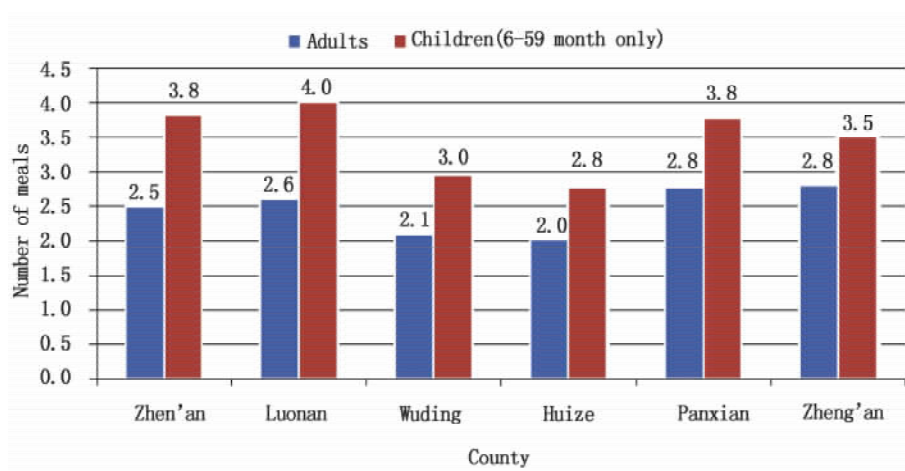


Figure A17 Food source

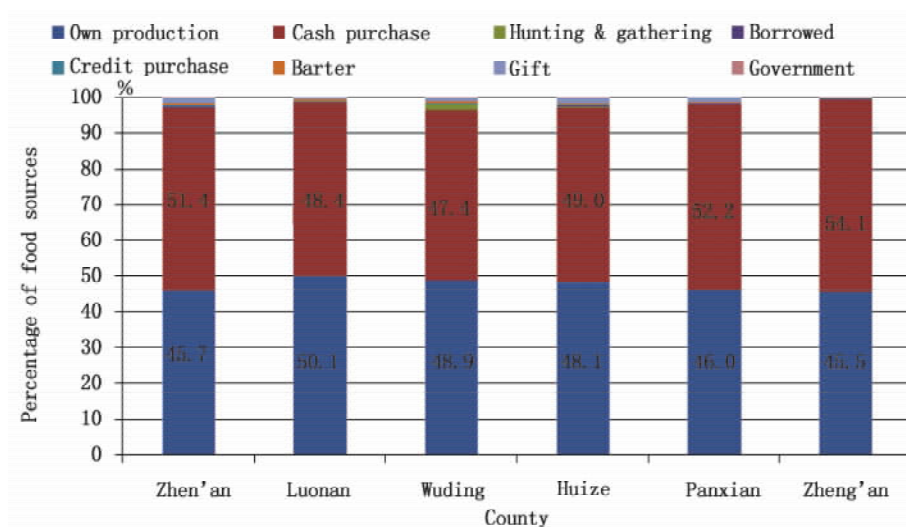


Figure A18 Food source by food item

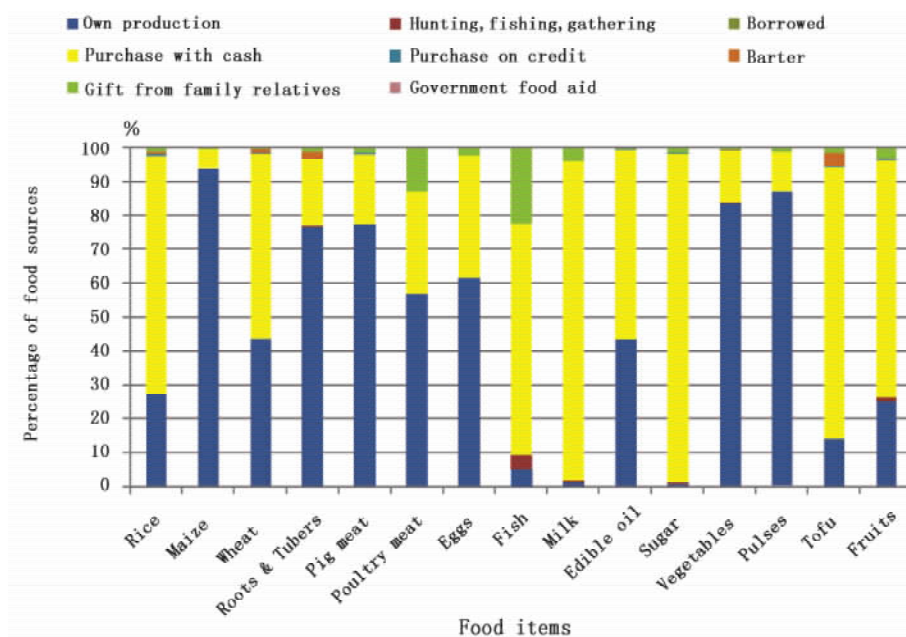


Figure A19 Food source by FCG

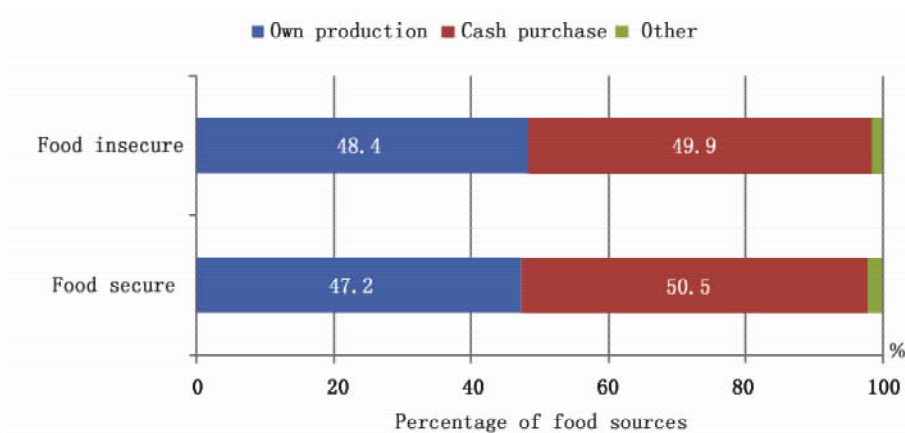


Table A53 Food sources by wealth quintile(percentage)

Wealth quintile	Food sources							
	Own production	Cash purchase	Hunting & gather	Borrowed	Credit purchase	Barter	Gift	Government
Zhen'an	1(Poorest)	47.5	47.5	0.2	0	1.5	0.4	1.8
	2	46.0	52.0	0	0	1.1	0	0.8
	3(Middle)	49.4	48.4	0.1	0	0	0.5	1.6
	4	47.4	50.2	0	0	0.1	0.7	1.6
	5(Wealthiest)	38.1	59.0	0.1	0	0	0.5	2.4
Luonan	1(Poorest)	53.7	44.3	0	0	0	1.1	1.0
	2	51.3	47.6	0.2	0	0.1	0.2	0.5
	3(Middle)	49.6	49.2	0	0	0	0.6	0.6
	4	49.7	48.9	0	0	0	1.1	0.2
	5(Wealthiest)	44.1	53.6	0.9	0	0	0.5	0.8
Wuding	1(Poorest)	45.2	44.4	2.3	0	1.1	0.3	5.4
	2	50.6	46.5	1.7	0	0	0.9	0.3
	3(Middle)	47.8	49.4	1.4	0	0.4	0.5	0.5
	4	51.5	44.7	2.2	0	0	1.1	0.5
	5(Wealthiest)	47.6	48.8	1.4	0	0.4	0.1	1.7

continued

	Wealth quintile	Food sources							
		Own production	Cash purchase	Hunting & gather	Borrowed	Credit purchase	Barter	Gift	Gover- nment
Huize	1(Poorest)	54.9	37.8	0	0.4	0.7	0	5.8	0.4
	2	50.9	45.0	0.6	0	0.9	0.5	2.0	0
	3(Middle)	49.7	48.3	0.2	0	1.5	0	0.3	0
	4	47.0	51.7	0.9	0	0.1	0.1	0.2	0
	5(Wealthiest)	42.0	56.1	0.4	0	0	0	1.4	0
Panxian	1(Poorest)	47.7	48.0	0	0.1	0	0	4.2	0
	2	47.8	51.2	0.1	0.2	0.5	0	0.1	0
	3(Middle)	46.5	52.5	0	0	0	0	1.0	0
	4	45.9	52.5	0	0	0.6	0.3	0.7	0
	5(Wealthiest)	39.3	60.5	0.1	0	0	0	0.1	0
Zheng'an	1(Poorest)	50.6	48.8	0	0	0	0	0.7	0
	2	51.7	47.3	0	0	0.3	0	0.4	0.3
	3(Middle)	50.3	49.5	0	0	0	0	0.2	0
	4	48.0	52.0	0	0	0	0	0	0
	5(Wealthiest)	31.0	68.8	0.1	0	0	0	0.1	0

Table A54 Demographic characteristics by FCG

	Food insecure	Food secure
Female household head(%)	13.0	12.0
Size of household	4.4	4.5
Average age of household head	52.2	48.4
Households with children(%)	39.7	52.2
Dependent ratio(%)	37.3	41.2

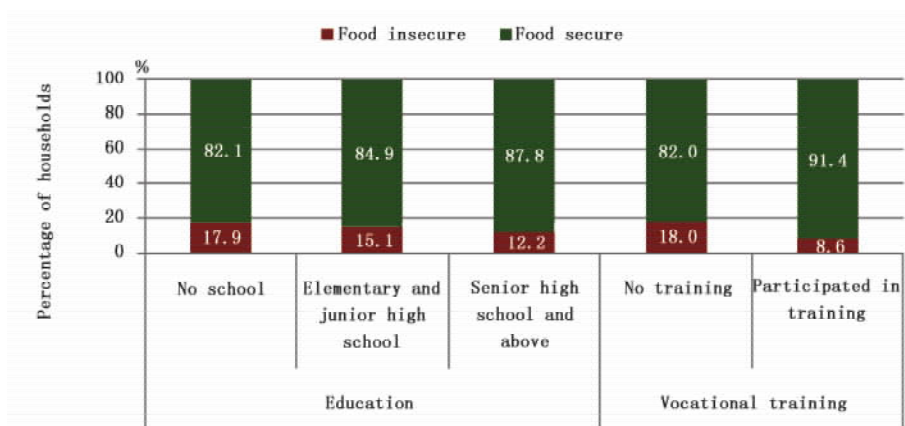
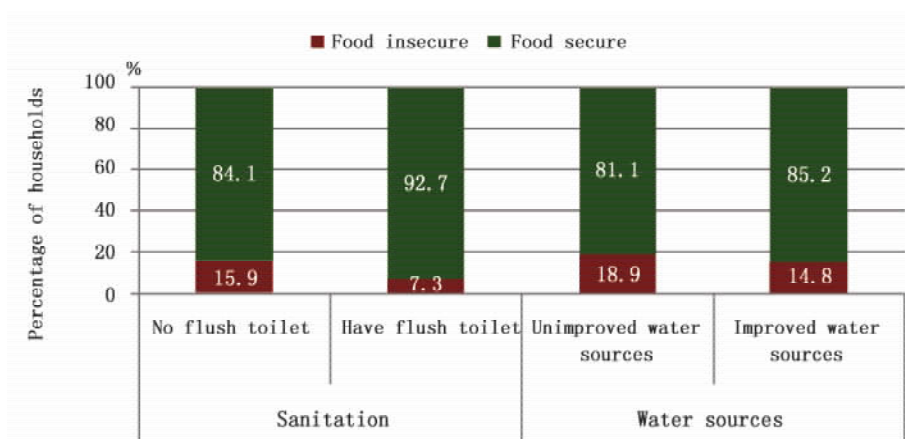
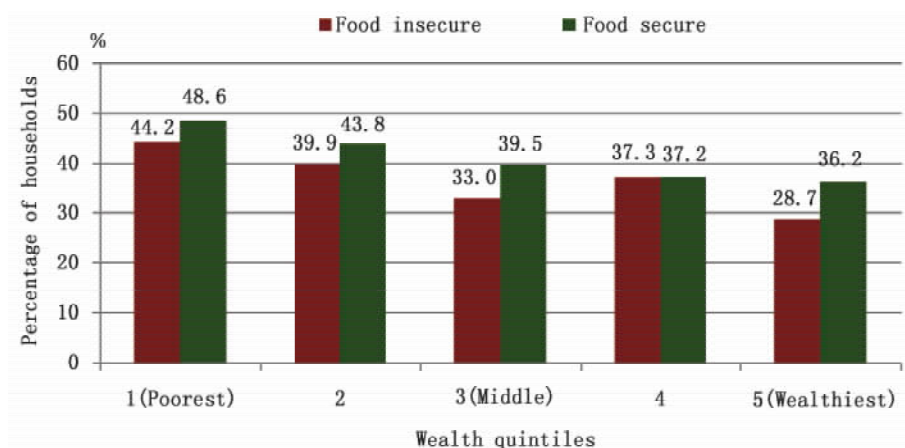
Figure A20 Education and training of household head**Figure A21 Sanitation and water sources**

Figure A22 Proportion of expenditure on food by FCG and wealth quintile



ANNEX 10 SHOCKS AND COPING STRATEGIES

Figure A23 Number of shocks reported

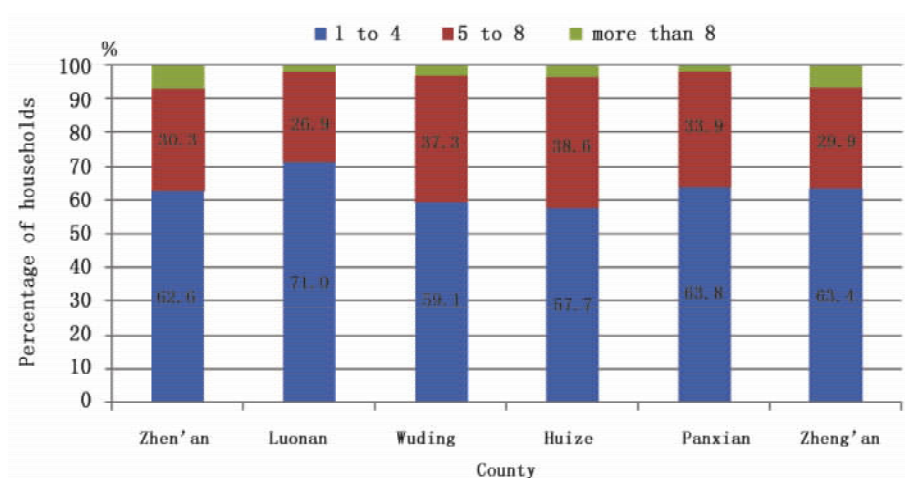
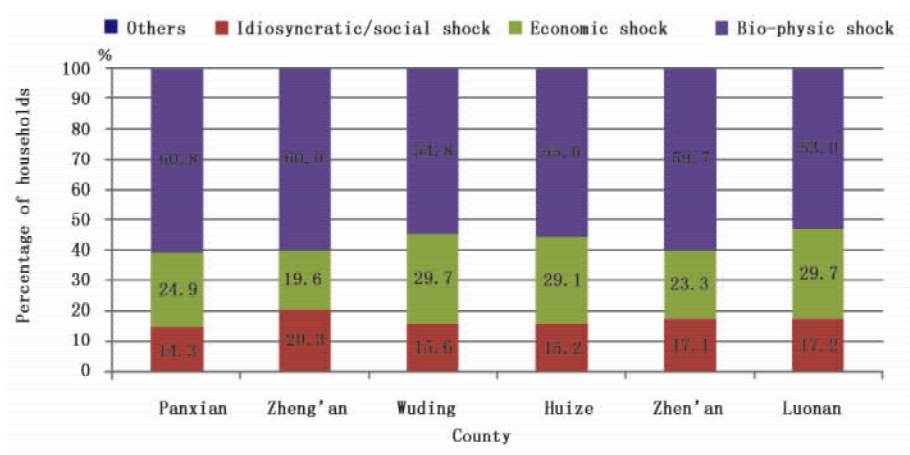


Figure A24 Type of shocks reported



Note: Bio-physic shock includes drought/irregular rains, floods, hail, frost, unusually high temperature, hot winds, landslides, erosion, earthquake, fire, severely high level of crop pests & disease, severely high level of livestock diseases.

Idiosyncratic/social shock includes lack or loss of employment, serious illness or accident of household member, death of a working household member, death of other household member.

Economic shock includes high costs of agricultural inputs (seed, fertilizer, etc.), reduced income of a household member, theft of money/valuables, theft of animals, high food/fuel prices.

Table A55 The second shock affecting households (percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Fire	0	0.7	0	0.5	0	0
Hail	0	5.0	6.1	6.5	4.7	0
Earthquake	0	0.7	1.5	0.5	0	0
Death of a working household member	0	0	0	0.5	0.5	0.5
Death of other household member	0	0.7	0.5	0.5	0.5	0
Theft of money/valuables	0	0	0	0	0	0
Theft of animals	0	0	0	0	0	0

	continued					
	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Conflict	0	0	0	0	0	0
Others	0	0	0	0	0	0
Severely high level of crop pests & disease	1.3	3.6	7.1	7.0	1.6	4.3
Unusually high temperature	2.5	5.7	4.0	5.0	2.1	1.1
Crop destroyed by wildlife	2.5	0	0	0	0	4.3
Landslides, erosion	3.1	1.4	0.5	0.5	1.6	4.8
Reduced income of a household member	3.1	3.6	8.1	5.0	3.7	2.1
Serious illness or accident of household member	3.1	2.9	7.6	6.5	4.7	8.0
Severely high level of livestock diseases	6.3	0.7	5.6	11.4	3.1	3.7
Hot winds/blast	6.9	3.6	4.0	5.5	14.1	7.0
Drought/irregular rains	10.1	13.6	18.2	19.9	31.4	25.1
Frost	10.1	10.0	2.0	6.0	6.8	0.5
High costs of agricultural inputs(seed, fertilizer, etc.)	11.3	22.9	15.7	10.9	8.9	7.0
High food/fuel prices	11.3	12.1	7.6	5.5	6.8	3.7
Lack or loss of employment	11.3	7.9	8.6	8.0	3.7	8.0
Floods	17.0	5.0	3.0	0.5	5.8	19.8

Table A56 The third shock affecting households(percentage)

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
High food/fuel prices	18.8	16.3	16.8	10.4	9.2	9.3
High costs of agricultural inputs(seed, fertilizer, etc.)	15.4	12.8	25.8	25.2	14.5	11.6
Drought/irregular rains	13.7	12.8	5.8	11.0	9.9	20.2
Hot winds/blast	2.6	1.2	1.3	4.3	16.0	7.8
Lack or loss of employment	7.7	8.1	11.0	11.0	7.6	12.4
Frost	5.1	8.1	1.3	4.9	10.7	0.8
Unusually high temperature	9.4	10.5	3.9	3.1	5.3	2.3
Floods	8.5	7.0	1.3	2.5	2.3	6.2
Severely high level of crop pests & disease	4.3	4.7	9.0	5.5	1.5	2.3
Landslides, erosion	3.4	1.2	0.6	0.6	2.3	6.2

continued

	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Serious illness or accident of household member	3.4	4.7	7.1	4.3	7.6	7.0
Severely high level of livestock diseases	2.6	1.2	1.3	6.1	5.3	0.8
Hail	1.7	3.5	5.8	2.5	2.3	0
Reduced income of a household member	1.7	8.1	5.2	7.4	5.3	8.5
Crop destroyed by wildlife	1.7	0	0.6	0	0	3.1
Fire	0	0	1.3	0.6	0	0
Earthquake	0	0	1.3	0.6	0	0.8
Death of a working household member	0	0	0	0	0	0
Death of other household member	0	0	0.6	0	0	0
Theft of money/valuables	0	0	0	0	0	0
Theft of animals	0	0	0	0	0	0
Conflict	0	0	0	0	0	0
Others	0	0	0	0	0	0.8

Table A57 Household coping strategies(percentage)

Coping strategy	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Reduced expenditures on everyday living	25.6	27.3	25.5	26.1	27.9	21.0
Borrowed money	14.9	16.9	12.1	19.8	17.5	27.5
Rely on less preferred, less expensive food	12.0	13.0	10.0	11.9	12.3	9.2
No need to do anything	9.6	15.9	5.6	7.7	12.5	14.8
Spent savings	7.2	2.6	10.0	7.7	3.3	2.4
Purchased food on credit	4.5	1.3	3.6	5.8	5.8	7.0
Others	4.3	3.2	7.8	6.9	5.6	3.2
Reduced saving	4.0	1.3	5.3	3.2	1.1	2.2
Borrowed food, helped by relatives	3.5	1.6	5.1	2.9	5.3	2.4
Reduced expenditures on agricultural input	2.7	1.6	3.2	0.3	1.1	1.1
Reduced expenditures on health and education	2.1	1.3	1.5	0.3	1.7	1.6
Sold or consumed livestock	2.1	1.3	3.6	1.8	1.9	2.2
Reduced number of meals per day (i. e. reduce from 3 meals to 2 meals)	1.9	1.9	0.2	0	0	1.1

Coping strategy	continued					
	Zhen'an	Luonan	Wuding	Huize	Panxian	Zheng'an
Reduced expenditures on visiting	1.3	3.2	1.5	1.1	1.7	0.3
Sold crop before harvest	1.1	6.2	1.7	1.8	0	1.9
Sold durable household goods	0.8	0.3	0	0	0	0
Reduced the proportions of the meals	0.5	0	1.2	0.8	1.7	0.8
Some household members migrated	0.5	0	1.5	1.6	0	0.8
Sent children to live with relatives	0.5	0	0	0.5	0	0
Skipped days without eating	0.3	0	0.2	0	0.3	0
Reduced expenditures on outside sightseeing	0.3	0	0	0	0	0
Gathered food	0.3	0.3	0.2	0	0.3	0
Consumed seed stock held for next season	0	0.3	0.2	0	0	0
Sold agricultural tools, seeds or other inputs	0	0.3	0	0	0	0.5

Figure A25 Shocks by wealth quintile

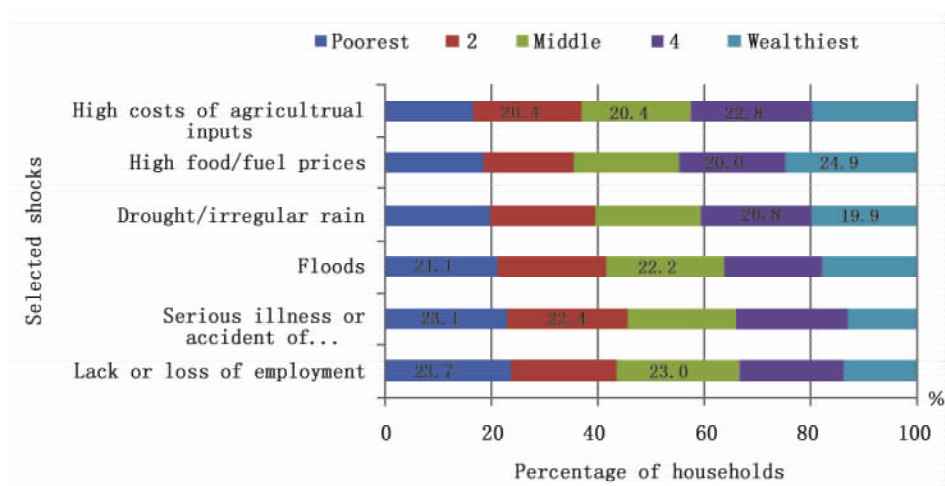


Figure A26 Shocks by livelihood group

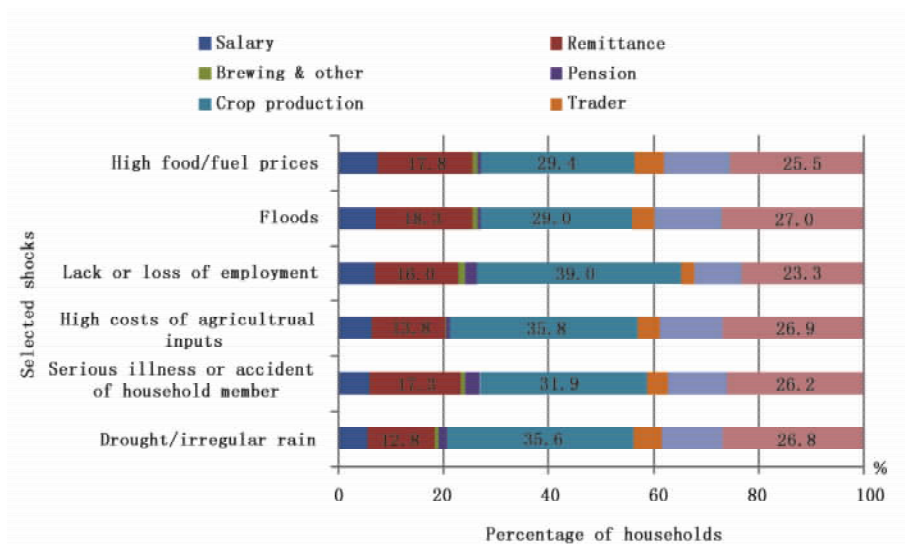
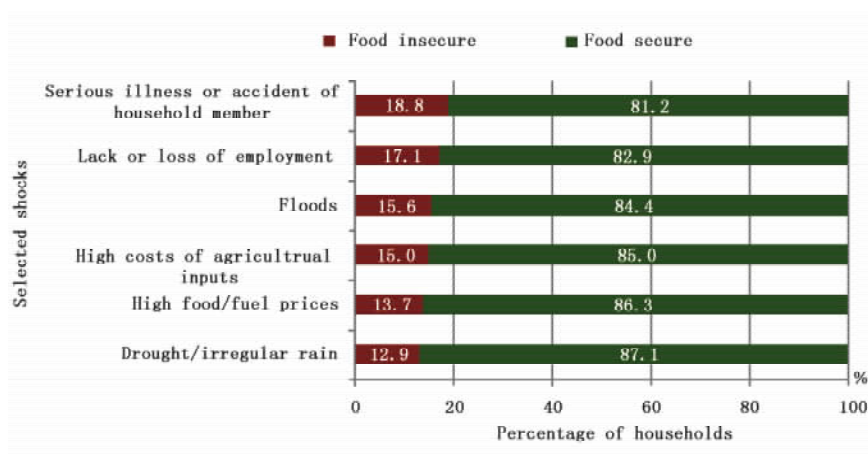


Figure A27 Shocks by FCG



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