MEASURES TO COPE WITH FOOD SHORTAGE IN THREE ETHNIC COMMUNITIES IN THE UPLAND OF VIETNAM: AN ECONOMIC APPROACH

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1. Introduction

The upland region of Vietnam consists of 37 provinces, covering around three-quarters of the country's total physical size. It is home to approximately 25 million people from 50 different ethnic groups. At present, problems related to livelihoods, particularly food shortages, are still encountered by several ethnic groups. Research has shown that some groups have problems in meeting their food demands. In some regions, food shortages may last between one to three months per year. In extreme cases, households have insufficient food for five to six months.

Food shortage is a multidimensional issue, of which the economic dimension has been regarded as the traditional aspect. In a broad sense, food shortage is both the cause and effect of social economic factors, such as human resource, health care, institution, and culture.

With generous support from the Rockefeller Foundation, a research project entitled "Measures to cope with food shortage: A case study in three ethnic communities in the upland of Vietnam" has been implemented by the Vietnam Institute of Anthropology since October 2004. This multidisciplinary study looks at food shortages in three communities in Hoa Binh, Bac Kan, and Nghe An province. The objectives of the study are to contribute to the achievement of sustainable food security by poor upland people and to improve their quality of life in the long-term.

This report is an integrated part of the above mentioned project. It focuses on the economic dimension of food shortage. In a more concrete way, the report is centered around three questions: 1) who experience food shortages and how serious is it?; 2) what economic factors (e.g., human asset, financial asset, physical asset, and natural asset) are related to their food shortage?; and 3) what economic measures are available or needed to help the lift them out of food shortages?

2. Research methodology

Food shortage can be classified in different ways. First, food shortage can be viewed in terms of time and severity, where it can be categorized into a chronic shortage (i.e., usually or always having a lack of food) or transitory shortage (i.e., only lacking food during certain periods).

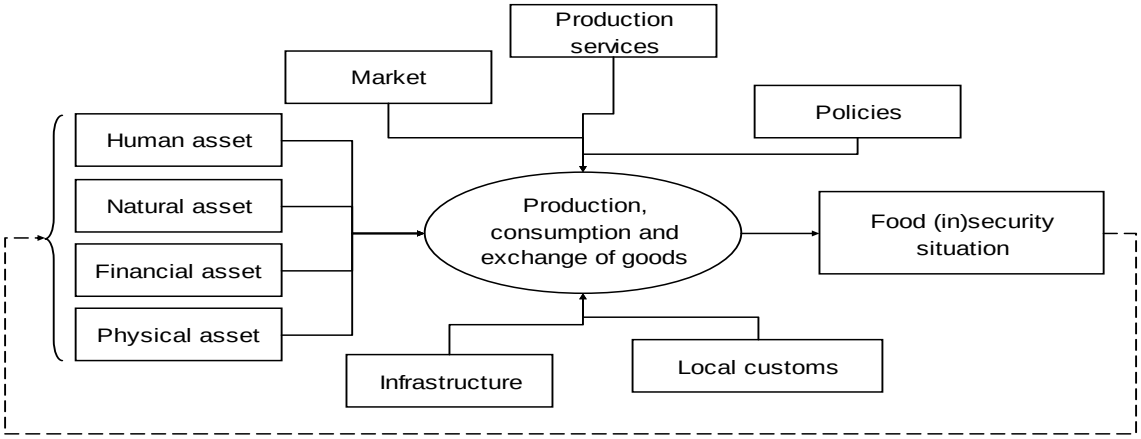
Second, food shortage can be viewed in terms of food quality, where a shortage of standard food (e.g., lack of regular rice) or superior food (e.g., lack of high quality rice) can be classified. Third, food shortages can be based on food varieties, such as a shortage of rice versus rice-substitutes (e.g., maize and cassava).

There are varying factors contributing to food shortages. For instance, some households experience shortages due to lack of labor resources, while other households have a land shortage, market risks, illness, etc. Other factors like access to social services, such as farm inputs and credit, which can have an influence on local livelihoods and particularly on household food production, may affect household food security indirectly.

In Vietnam uplands, poverty and food shortage are often related to each other. In the official wealth classification by the General Statistics Office, "hungry households" are referred to those that usually or always suffer from food shortage (see Section 3).

This paper examines the food shortage problem of the study households from an economic perspective, using a combination of qualitative and quantitative approaches. The principle assumption is a household's food shortage/ abundance situation is an outcome of production activities (both farmed and non-farmed), consumption and exchange of products/ resources (including labor) (see Figure 1). These activities are often influenced by factors under the control of the households (e.g., human asset, physical asset, natural asset, and financial asset) as well as external factors (e.g., market, infrastructure conditions, production services, state policies, and local customs[1]). The state of food (in)security in the current period has effects on the households factors in the next period.

Figure 1: The research framework



[1] This report will not elaborate the relationship between local customs and food shortage as it is discussed in the report by anthropologist advisors

Data for this report came from a household survey, group discussion, field observations and secondary sources. Data collection activities were conducted in three periods: 1) preliminary scoping from late 2004 to early 2005; 2) survey of 184 households and secondary data collection in mid-2005; and 3) in-depth village study based on preliminary analysis of the collected data.

3. Overview of food shortage situation in the study sites

The study sites are located in three of eight socio-ecological regions in Vietnam. Hoa Binh province is in the Northwest region, whose rate of food poverty ranks highest in the country (see Table 1). Bac Kan province lies in Northeast region, ranking fourth in the food poverty rate. Nghe An province is located in the North Central region, and has the third highest food poverty rate.

Table 1: Rate of food poverty in Vietnam, by region

	Year 2002	Year 2004
Red River Delta region	6,5%	4,6%
Northeast region	14,1%	9,4%
Northwest region	28,1%	21,8%
North Central region	17,3%	12,2%
South Central Coastal region	10,7%	7,6%
Central Highlands region	17,0%	12,3%
Southeast region	3,2%	1,8%
Mekong River Delta region	7,6%	5,2%
National Average	***9,9%***	***6,9%***

Source: General Statistics Office (2006)

According to the Vietnamese General Statistics Office (GSO), food poverty or hungry households are referred to those that suffer from shortage of food for certain months in a year, who have to borrow food/ money to meet their demands but do not have ability to repay. In the period from 2000-2004, the food poverty line was 145 thousand Vietnamese Dong (VND) per capita per month in urban area and 112 thousand VND in rural area. Since 2004, a new poverty line has been introduced. where food poverty is defined as having a monthly per capita income of below 163 thousand VND in urban area and 124 thousand VND in rural area. In 2002, food poor population had an income of less than 32% and 42% of the average per capita income in the rural and urban areas, respectively (see). In 2004, there was a decrease to 25.6% in the rural area and 33.6% in the urban area. In the three study regions, per capita income of the

food poverty population was below 58% of the average income in the rural area and 75% in the urban area in 2002; and below 48% in the rural area and 62% in the urban area in 2004.

Table 2: Average per capita income and expenditure by region

	2002		2004	
	Income	Expenditure	Income	Expenditure
Red River Delta region	353,1	271,2	488,2	373,5
Northeast region	268,8	220,2	379,9	293,8
Northwest region	197,0	179,0	265,7	233,2
North Central region	235,4	192,8	317,1	252,7
South Central Coastal region	305,8	247,6	414,9	330,8
Central Highlands region	244,0	201,8	390,2	295,3
Southeast region	619,7	447,6	833,0	577,0
Mekong River Delta region	371,3	258,4	471,1	335,1
National Average	***356,1***	***269,1***	***484,4***	***359,7***

Measuring unit: thousand VND

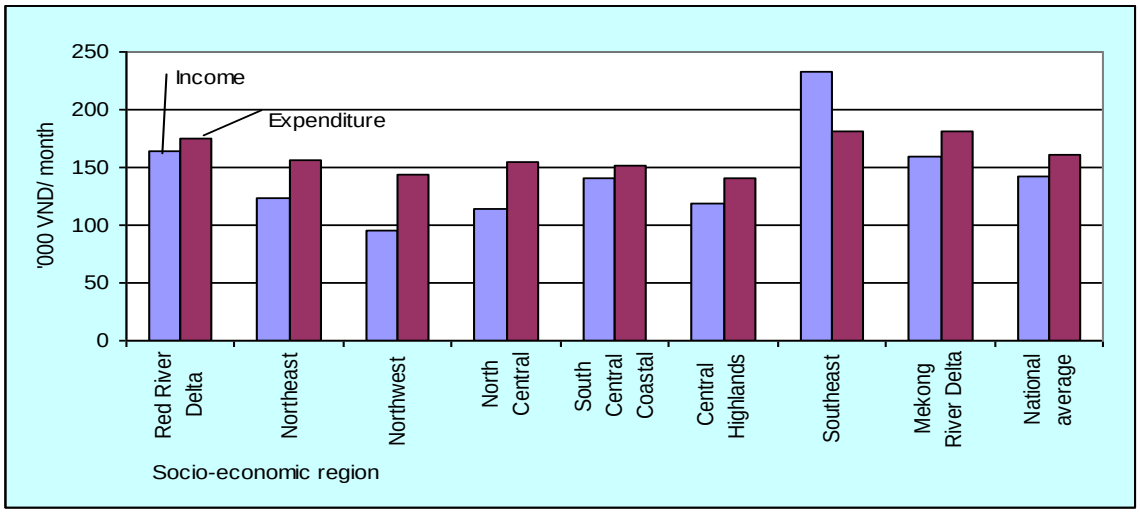
Source: GSO (2004; 2006)

Households with the lowest income[2] in general spend more than their earnings. At the national level, expenditure of the lowest income group is 13.2% higher than the average income. The three study regions have the largest gaps between expenditure and income, compared to other regions (see Figure 4). Of the eight socio-economic regions, the Northwest has the largest gap between income and expenditure.

On average, a person of the lowest income group in this region overspent 51.6% of their income. The North Central region ranks second, with 34.6% overspending. The Northeast is third with spending about 26% higher than their income. Most of the expenditures (66.5%) of the lowest income households were devoted to purchasing food. This spending accounts for 75.2% of the average income at the national level.

[2] Due to unavailability of data for food poverty group, this discussion is based on the lowest income group (out of five groups) under the 2004 Vietnam Household Living Standard Survey. In the three study regions, per capita incomes of the lowest income groups are all under food poverty line.

Figure 2: Income and expenditure of the lowest income group, by region



Source: GSO (2004)

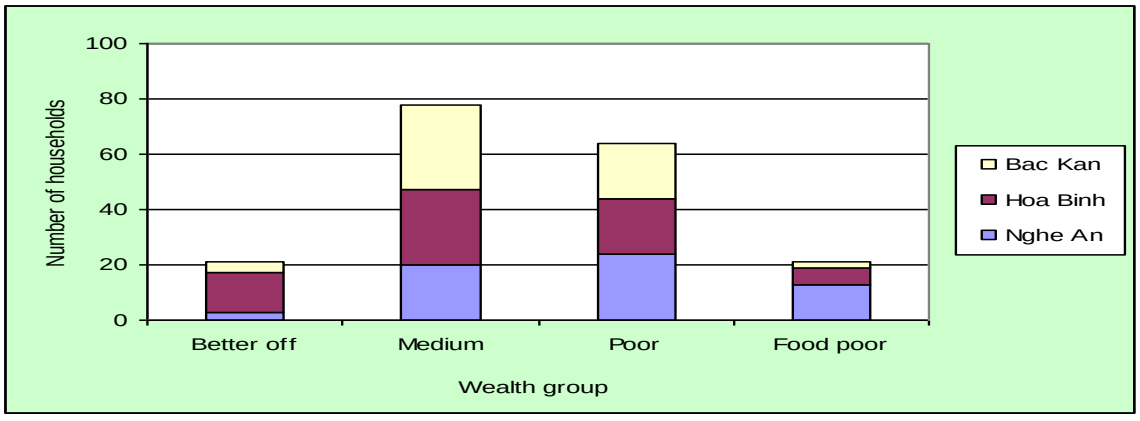
For more information on the study sites, please see reports by Anthropologist advisors.

4. Major findings

4.1. Food poverty and food shortage in the study villages

Poor and hungry households made up a large portion of the population in the study villages. Of the total 184 surveyed households, about 21 (11% of the sample) are food poor and 64 (35%) are poor (see Figure 3). This proportion varies across provinces. Bac Kan province has the lowest ratio (4%) of food poor households over the total surveyed households followed by Hoa Binh (9%), while Nghe An experiences the highest percentage (22%).

Figure 3: Distribution of surveyed household per wealth group



Source: Household survey

In all three provinces, the average income of food poor households is much lower than the national food poverty line (see Table 3). In 2004, average per capita income of the food poor group was only 83 thousand VND per month, at around 46% of the average per capita income of the sample average. In Hoa Binh and Bac Kan, the food poor households had no more than 62 thousand VND per capita per month. In Nghe An province, the amount was higher, at 92 thousand VND. However, the gap between average income of surveyed households and that of the food poor group was lowest in Hoa Binh province. On average, income of a food poor household was 48% of average earning of the surveyed households in Hoa Binh province, and 27% of the average income of and 34% of surveyed households in Nghe An (20% of the Tan Ky district). When compared to better-off households in the same study site, the gap in income between the food poor widened. On average, a better-Tan Lac, the study district). This figure was 26% of the average income of surveyed households in Bac Kan province (and 20% of the average income of Cho Moi district), off household earned as much as 3.7 times that of a household in the poorest group. The survey site in Bac Kan province experienced the largest difference in incomes of these two groups, at 784%. Nghe An ranks second with a gap of 586%, while Hoa Binh is third with its income of better-off households being 376% that of those that are food poor.

Table 3: Average income and expenditure of surveyed households in 2004

	Nghe An		Hoa Binh		Bac Kan		Average	
	Thu	Chi	Thu	Chi	Thu	Chi	Thu	Chi
Better-off	562	640	233	149	390	174	314	224
Medium	304	392	125	87	202	152	200	191
Poor	156	206	100	72	117	111	127	135
Food poor	96	206	62	54	50	61	83	146
Compared to average per capita income of the surveyed district								
	486		233		183			

Unit: thousand VND per capita per month

Source: Cho Moi District Party Council (2004); Cho Moi District Statistic Office (2005); Tan Ky District People's Committee (2004); Tan Ky District Statistic Office (2005); Tan Lac District People's Committee (2004); Household survey

In addition to having low income, households in the food poor group also experienced overspending (see Table 3). On average, expenditure of a food poor household was 176% its income. In the study site in Nghe An, food poor households had highest rate of overspending, with an expenditure being 215% of the income in

2004. In Bac Kan, the rate was 124%. Only in Hoa Binh that the average income of the food poor households surpassed expenditure. However, food poor households in Hoa Binh were the ones with lowest expenditure among all the study sites.

Furthermore, household expenditure is spent on paying fees, taxes, and social rituals. On average at all three sites, this spending was 16.2% of the total household expenditures. In the poor and food poor groups, such spending was even higher than daily spending on food (excluding rice).

Table 4: Average rice production of surveyed households in 2004

	Nghe An	Hoa Binh	Bac Kan	Average
Better-off	51	301	293	264
Medium	46	238	271	202
Poor	15	161	168	109
Food poor	19	153	48	62
Average	28	221	229	161

Unit: kg per capita per year

Source: Household Survey

In terms of rice production, there is significant difference among wealth groups. In general, rice production in better-off and medium households in 2004 was above the per capita average (see Table 4). By contrast, poor and food-poor households have a rice production below the average (38.5% of the average and 23.5% of the better-off group). In addition, rice production also varies across sites. Nghe An experiences extremely low rice production compared to the other two sites. In 2004, average rice production in Nghe An was nearly 13% that of Hoa Binh and 12.2% of Bac Kan province.

Shortage of rice (the main food of the study villages) was common. Of the total 184 surveyed households, 122 (66%) did not have sufficient rice to meet their demands in 2004 (see Table 5). The situation was worst in Nghe An, where about 90% of the surveyed households did not have enough rice to eat, including those in the better-off and medium groups. In Hoa Binh province, approximately 79% of the interviewed households, including half of the better-off group, ran into rice insufficiency problem in 2004. Bac Kan province had the lowest proportion of households facing food shortages (26% ran short of food (rice) for a month or more). In general, food shortage in the study sites is correlated with household economy. Better-off households are less likely to run short of rice compared to poor and food-poor households[3].

[3] Correlation coefficient between rice shortage and wealth group is 0.3527, significance at 1%.

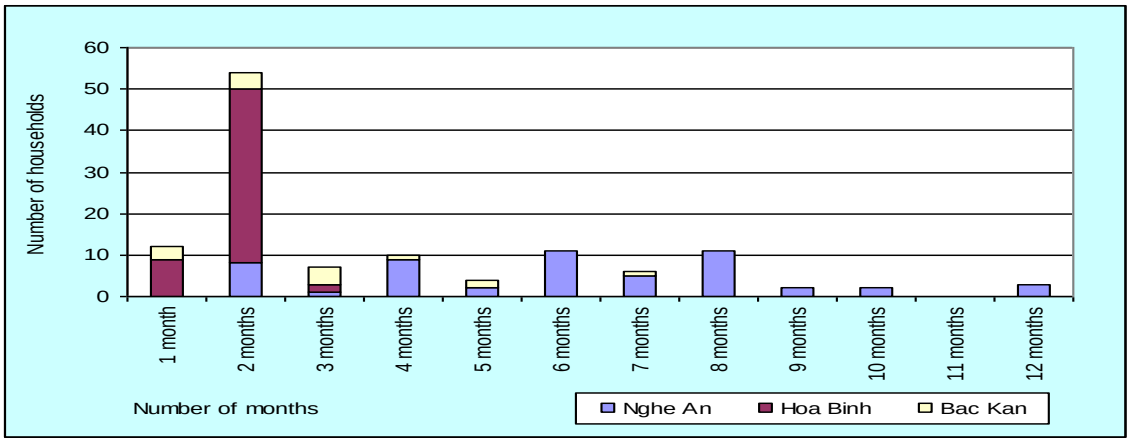
Table 5: Rice shortage in the study sites

	Nghe An	Hoa Binh	Bac Kan	Total
Rice sufficiency	***6 (10%)***	***14 (21%)***	***42 (74%)***	***62 (34%)***
▪ Better-off	2 (3%)	7 (10%)	4 (7%)	13 (7%)
▪ Medium	3 (5%)	5 (7%)	27 (47%)	35 (19%)
▪ Poor	1 (2%)	1 (1%)	10 (18%)	12 (7%)
▪ Food-poor	0 (0%)	1 (1%)	1 (2%)	2 (1%)
Rice shortage	***54 (90%)***	***53 (79%)***	***15 (26%)***	***122 (66%)***
▪ Better-off	1 (2%)	7 (10%)	0 (0%)	8 (4%)
▪ Medium	17 (28%)	22 (33%)	4 (7%)	43 (23%)
▪ Poor	23 (38%)	19 (28%)	10 (18%)	52 (28%)
▪ Food-poor	13 (22%)	5 (7%)	1 (2%)	19 (10%)
Total	**60 (100%)**	**67 (100%)**	**57 (100%)**	**184 (100%)**

Source: Household Survey
Note: numbers in parentheses refer to the percentage over the total (per site)

Rice shortage of each household varies between 1 to 12 months (see Figure 4). Of the total households with rice shortage, 60% lack rice for 1 to 3 months in 2004. Another 20% is short of rice for 4 to 6 months, while the rest for more than six months. There are three extreme cases (2%) where rice shortage was experienced over a year. In addition, variations exist across sites. In Hoa Binh, rice shortage households ran short of rice only up to three months while those in Nghe An, households lacked rice between 2 to 12 months. In Bac Kan, most households were faced with rice shortage up to five months (only one case has a seven -month rice shortage).

Figure 4: Duration of rice shortage in the study sites



Source: Household Survey

4.2. Economic factors influencing food shortage

This section will focus on elaborating the relationships between economic factors and food shortage situation at the three study locations.

Natural asset: Farmed land has a close relationship with household food production. In the study sites, there is significant variation in paddy field among wealth groups (see Table 6). Poor and food-poor groups have an average paddy field per capita below the average of the entire sample. Average paddy field per capita of food poor group was only 44% that of the better-off group, and 63% of the sample average. With 96.5% of the rice produced from the paddy field, the difference in paddy field ownership had a close relationship with rice production. Correlation analysis indicated significant relationships between average paddy field per capita with rice production and food shortage[4].

Though not distinctive as paddy field, size of fishpond is also statistically associated with household food sufficiency. Average fishpond size per capita of food-poor group was about 58% of the sample average and 96.5% of the better-off group. Correlation analysis results reported that households with larger fishpond size are more likely to achieve rice sufficiency than those with smaller or now fishpond[5]. However, the relationship between average upland field per capita and food sufficiency is not clear. Food-poor households are more likely to use larger upland field but the difference was not found to be statistically significant[6].

Table 6: Average production land per capita by wealth group

	Paddy field	Upland field	Fishpond
Better-off	583.34	689.98	6.11
Medium	458.86	798.58	12.42
Poor	327.01	747.11	10.37
Food poor	255.72	1515.29	5.95
Average	404.02	850.08	10.25

Measuring unit: m^2

Source: Household Survey

[4] Correlation coefficient between paddy field per capita and rice production is 0.7019 ($p<0.0001$). Correlation coefficient between paddy field per capita and food shortage is 0.3049 ($p<0.0001$).

[5] Correlation coefficient between fishpond size and rice sufficiency is 0.2041 ($p<0.0055$).

[6] Correlation coefficient between per capita upland field and food shortage is 0.0537 ($p<0,4690$).

Human asset: There is no significant difference in the number of laborers across study households. On average, there are 2.7 laborers per household. The labor per capita rate is 0.54. These rates vary slightly across wealth groups. Food-poor group has 2.2 laborers per household and 0.52 labor per capita rate, compared to the better-off group (3.1 and 0.6, respectively). Households of medium and poor groups have average figures of the sample. Correlation analysis shows that the relationship between labor force and food shortage is not statistically significant[7]. Similarly, sex of the household head is not statistically related to food shortage situation. The proportion of households with food shortage over total number of male headed group was similar to that of the female headed group (around 50%). Correlation analysis shows that no statistical relationship is found between sex of household head and food shortage[8].

Health situation of the household head is correlated with the wealth group of the household. No households in the better-off group have heads suffering from an illness.

Households having a higher education level are more likely to achieve food sufficiency than those who have lower or no education. In addition, households with head being (local) state officials are more likely to be in the better-off group[9].

Financial asset: A household's financial capability can make important contribution to its food sufficiency situation, particularly when food production does not meet household food demand.

In the study sites, average cash income of food-poor household is about 50% of the sample average, and only 27% in better-off group (see Table 7). In 2004, cash income of households with food sufficiency was as high as 163% of households with food shortage. More specifically, it was 384% in Nghe An, 167% in Hoa Binh, and 160% in Bac Kan. Correlation analysis shows that cash income and whether or not the household achieves food sufficiency is statistically related; households with high cash income are more likely to achieve food sufficiency[10].

Table 7: Average cash income per capita in 2004 by wealth group

Better-off	553	183	355	273
Medium	299	87	163	170
Poor	153	75	93	110
Food-poor	93	37	43	74
Average	208	99	149	150

Measuring unit: thousand VND per capita per month
Source: Household Survey

[7] Correlation coefficient between labor force and food shortage is 0.0273 ($p<0.7139$).
[8] Correlation coefficient between sex of household head and food shortage is 0.0079 ($p<0.9158$).
[9] Correlation coefficient between household wealth and education level of household head is 0.2382 ($p<0.0011$). Correlation coefficient between household wealth and health situation of household head is 0.2143 ($p<0.0035$). Correlation coefficient between household wealth and whether or not household head is a local official is 0.2097 ($p<0.0045$).
[10] Correlation coefficient between cash income and food shortage is 0.2266 ($p<0.0025$).

Income diversification is correlated with household wealth but not with household food shortage (see Table 8). Households in better-off and medium groups mostly have income from two or more sources[11]. By contrast, poorer households, particularly those in food-poor group, only have no more than two or three income sources. However, number of income sources is not distinctive between the food shortage and food sufficiency groups. Correlation analysis confirms a statistically significant relationship between income diversification and household wealth. The analysis also indicates that no statistical relationship exists between income diversification and food shortage[12].

Table 8: Income diversification, household wealth and food shortage

	Income from one source	Income from two sources	Income from three sources	Income from four sources	Total
Better-off	2 (9.5%)	2 (9.5%)	5 (23.8%)	12 (57.1%)	21 (100%)
Medium	8 (10.3%)	20 (25.6%)	35 (44.9%)	15 (19.2%)	78 (100%)
Poor	11 (17.2%)	18 (28.1%)	25 (39.1%)	10 (15.6%)	64 (100%)
Food-poor	4 (19.0%)	9 (42.9%)	5 (23.8%)	3 (14.3%)	21 (100%)
Rice sufficiency	13 (21.0%)	15 (24.2%)	18 (29.0%)	16 (25.8%)	62 (100%)
Rice shortage	12 (9.8%)	34 (27.9%)	52 (42.6%)	24 (19.7%)	122 (100%)

Note: Numbers in parentheses are percentage over total within group

Source: Household Survey

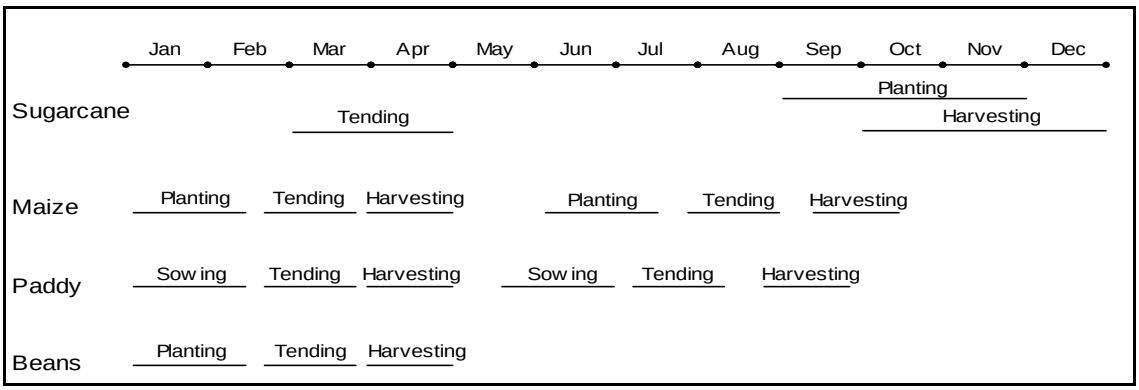
When money is earned and spent could also play a role in household financial capability, particularly for those in poor and food-poor groups. For most of surveyed households in these two groups, earning from cropping accounted for more than 60% of the total income. However, cropping is highly seasonal (see example in Figure 5). Harvest time is concentrated in the period of April through May as well as August through September. Some cash crops, such as sugarcane in Nghe An and ginger in Bac Kan, can also be harvested between October and December. Despite the breaks in cultivation and harvest, spending continually takes place throughout the year. In addition, major expenditures often occur when there is no harvest. Examples are New Year Festival and the rituals or festivals that occur between January and March, and inputs for cropping (e.g., seeds and fertilizer).

[11] Four major sources of income of the local people are cropping, livestock raising, forestry, and non-farm sources.

[12] Correlation coefficient between income diversification and household wealth is 0.2373 ($p<0.0012$).

Correlation coefficient between income diversification and food shortage is 0.0642 ($p<0.3864$).

Figure 5: Seasonality of major crops in Nghe An



Source: in-depth study

Access to services and support:

There were 84 of 184 surveyed households (45.7%) who received training between 2001 and 2004. However, there were variations by grouping. Only 14.3% of the households in food-poor group received some training, while the averages in the other groups are between 42 and 58%. There also is a difference in the proportion of households receiving training in the food sufficiency group (68%, or 42 out of 62 households) versus those in the food shortage group (34%, or 42 out of 122 households). The primary reason given for not participating in training activities was that most households (70%) thought they were not the target group for the training.

About 125 of 184 households (68%) borrowed money from the bank or development projects/ organizations from 2001 to 2004. The average amount borrowed per household (with credit) during this period was 3.6 million VND (Table 9). It is, however, very interesting that while the proportion of households in the food-poor group borrowing money is 48%, the average borrowing per household in this group substantially surpassed the others. This reflects a disproportionate access to credits by local households. For those who did not borrow money from official sources, over 30% said it was because they were afraid of not earning enough money to pay back the interest. Other households cited various reasons.

Table 9: Borrowings from official sources during 2001-2004

	Number of households	Total borrowings (thousand VND)	Average per HH (thousand VND/ HH)
Better-off	17 (81%)	55,600	3,270
Medium	55 (71%)	219,200	3,985
Poor	43 (67%)	122,400	2,847
Food-poor	10 (48%)	47,400	4,740
Total	125 (68%)	444,600	3,557

Source: Household Survey

It is generally observed across wealth groups that improved infrastructure can make a significant contribution to the improvement of market conditions. As a result, most of local produces can now be sold at the farm gate. In addition, improvements in for the sugarcane market in Nghe An province also has been attributed to the presence of Song Con Sugarcane Factory located near the study site.

Furthermore, in regard to access to external support, there is presence of development projects, particularly the National 135 and 134 Programs, in all study sites. In addition to local infrastructure like power grid, road, irrigation system, and health post for public service, these programs have also provided support to specific households. In 2004, 40 out of 184 surveyed households (21.7% of the sample) received support from outside programs in terms of credit, food, (subsidized) seeds, housing materials, consumer products and other materials. Total estimated value of support was over 18 million VND. However, such assistance was provided to not only households of poor and food-poor groups, but also to better-off (one household or 2.5% of the households receiving support) and medium (15 households or 37.5% of the households receiving support) groups.

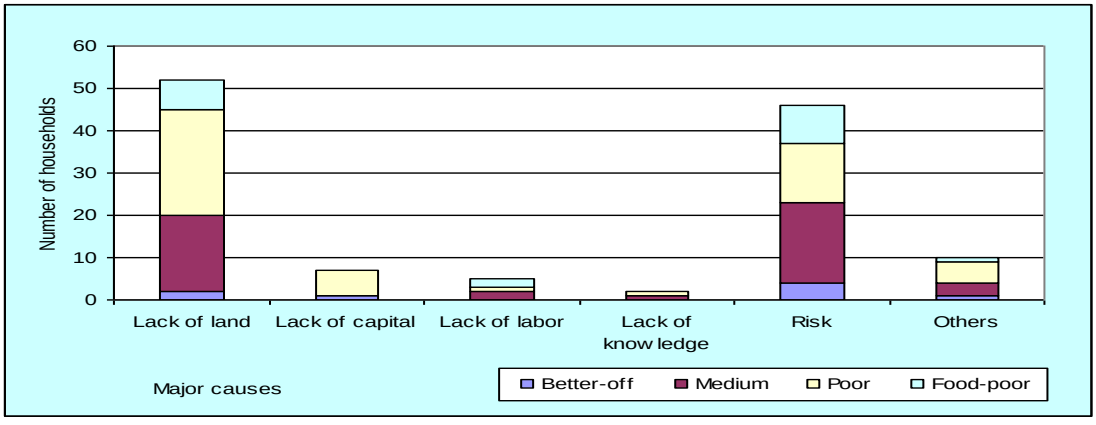
5. Economic measures to deal with food shortage

5.1. Main causes to food shortage in the study households

Based on feedback from local people, there are five major groups of causes leading to local food shortage situation. They are lack of production land, lack of capital, lack of labor, lack of knowledge, and risks. All other causes are combined into a sixth group (see Figure 6). The discussion in this section will focus on three major reasons: lack of land, risks, and lack of capital.

First of all, lack of production land is a factor that most of the local people consider as the main cause to food shortage. Of the 122 households with insufficient food in 2004, 52 households (43%) thought their food shortage situation originated from a lack of land. This can include lack of sufficient size of land or quality of the land to be suitable for crop (rice) production.

Figure 6: Summary of main causes to food shortage



Source: Household Survey

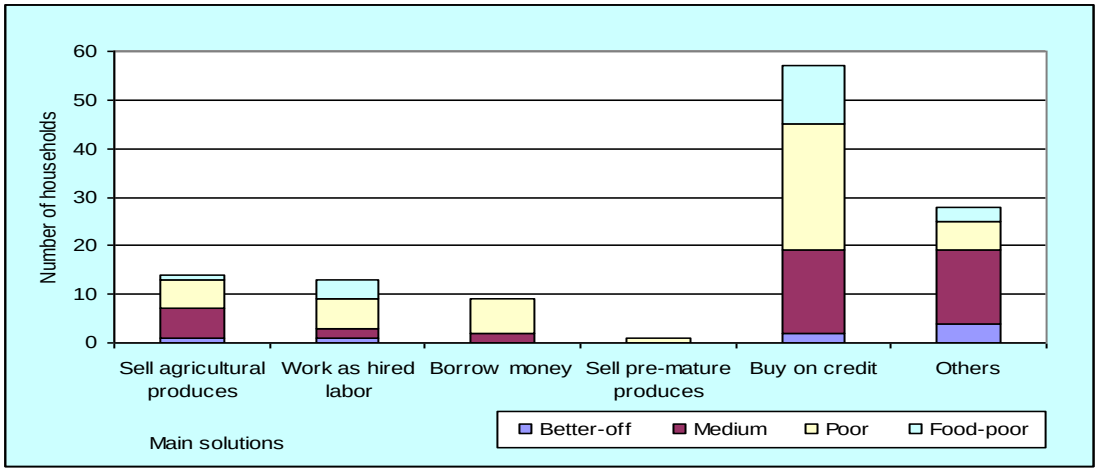
Second, risks also were seen as playing a role in food shortage. About 46 households (38%) stated risks as the main reason leading to their food shortage. Risks can be divided into two groups, risks associated with production and risks associated with marketing. In the former group, disease (for livestock), pest (for crop), weather (flood, rain, and drought), and thefts were frequently mentioned by local people. In the latter group, lack of market information, prices, and weather were common responses.

Third, lack of capital for investment (i.e., weak financial capability) is another specified main cause to food shortage. Although only seven households (6%) consider that lack of capital led to their insufficient food supply, in-depth inquiry in the village showed that lack of cash for rice during the off-season period leaves many households in a situation in having to buy food on credit at a price higher than the market price. This facilitates a vicious circle of having to use credit to pay at higher prices and leaving less income available for the future.

5.2. Measures to deal with food shortage

To deal with food shortage, local households in the study sites have employed different approaches, including buying on credit, working as hired labor, selling agricultural produces, and borrowing money for consumption (see Figure 7). For many households, purchase of food (rice) on credit is the most frequent measure being applied in case of food shortage. About 57 out of 122 households with food shortage (47%) have to frequently resort to this measure. When engaging in purchase on credit, the buyer only needs to pay for the goods at the time of crop harvest (or when there is money). Thus, the buyer needs not only to know the seller well enough but also pay a price around 10-20% higher than the market price. As mentioned earlier, the negative side of this arrangement is that it is a temporary solution that may have adverse long-term repercussions by creating a vicious circle that promotes dependency rather than self sufficiency and hinders eradication of hunger.

Figure 7: Summary of measures to deal with food shortage



Source: Household Survey

Working as hired labor is also a common strategy to address the problem of food shortage. Some households borrow rice when needed and offer labor services as repayment. Of the 122 households with food shortage, 13 households (11%) resorted to this form of payment. However, as the time when the food gets short often coincides with off-season period, wage for hired labor is often lower than during the in-season period.

Additionally, households with food shortage also sell their farm produces (e.g., maize and cassava) for rice. There were 14 households (12%) in this study who did so. However, this strategy can only work for households that run short of rice but still have other produces in stock. This is why this strategy can only be used to address temporary food shortage.

Another way that some households try to resolve food shortage is through borrowing money. Similar to households who sell farm produces, this approach can only be applied for households with temporary shortage of food. Food-poor households find it difficult to apply since few people are willing to lend money to them for consumption purpose out of fear that their debt would not be repaid.

Local households also can go to the forest when they run short of food. In Bac Kan, for example, logging for cash (to buy rice) has been a frequently applied way in times of food shortage. However, as forest resources are declining and forest land has been allocated to other people, this tactic is less likely to be viable in the long run.

Not only short term but also long term strategies have been applied to deal with food shortage. So far, local people have tried three important measures, including borrowing of capital to invest in production (as observed in all three study sites), participating in rotational mutual-assistance fund (e.g., ac Kan), and converting upland into a paddy field (e.g., Bac Kan).

Of the surveyed households, no one sell or exchange their physical or natural assets for food. Some households in food-poor group are still in possession of valuable assets like motorbike or television (see Table 10). The fact that physical and natural assets have not been sold nor mortgaged for food has partly been attributed to the timely support from national hunger eradication programs and outsiders. For instance, the Song Con Sugarcane Factory has been advancing rice for local sugarcane growers without charging any interest.

Table 10: Ownership of machinery by study households

	Motorbike	TV	Ploughing machine	Milling machine	Sewing machine	Threshing machine
Better-off	0.90	0.81	0.05	0.10	0.14	0.14
Medium	0.49	0.40	0.05	0.05	0.01	0.13
Poor	0.28	0.27	0.02	0	0	0.02
Food-poor	0.05	0.29	0	0	0	0
Rice sufficiency	0.79	0.37	0.06	0.06	0.06	0.16
Rice shortage	0.22	0.39	0.02	0.02	0	0.03
Sample average	0.41	0.39	0.03	0.03	0.02	0.08

Source: Household Survey

6. Conclusion and recommendations

The discussion provided details on the food shortage situation in three study sites, Nghe An, Hoa Binh, and Bac Kan provinces. The report also elaborated on some economic factors influencing food shortage. Findings from the study show that food shortage in the study sites are correlated with factors, such as paddy field ownership, rice production, attributes of the head of the household (e.g., political position, health status, and education level), household cash income, and timing when earning and spending money. In contrast, food shortage was not seen as related to size of upland field, number of laborers, sex of household head, and diversification of income sources.

The following recommendations are given to address the food shortage problem. It is important to note that these recommendations are complementary, and efforts to eradicate hunger only can be satisfactorily achieved when important measures are undertaken simultaneously.

- Reduce household spending on social relations: Households with (chronic) food shortage problem may consider reducing expenditures for social rituals and related activities. For this recommendation to be undertaken, it is important that it be integrated into local campaigns against wasteful rituals and ceremonies.

- Reduce or exempt fee or tax for disadvantaged households: Reductions are needed in spending less than the daily costs for food (except rice). Also, payment of fee and tax can be burdensome for disadvantaged households. It is recommended that local authorities consider reducing or exempting fee/ tax for these type of households.

- Provide rotational fund in parallel with technical training and fund management assistance: While many households are in need of capital for investment in farm production, they do not borrow money from official sources due to their risk-adverse feeling. Provision of rotational fund to needy households may help improve their financial capability. To reduce risk associated with the loan, it is important to provide trainings in necessary technologies and fund management.

- Introduce income generation activities: During the off-season period, efficient use of (redundant) labor can make important contributions in achieving food sufficiency. It is recommended that income generation activities be introduced to help local farmers increase their income during the off-peak season.

- Improve access to (social) services: Lack of necessary services at the time of need is one of the reasons contributing to the risks associated with farm production. To help farmer alleviate risks, it is important that farmers have access to necessary services, such as seed and farm input supply, veterinary services, market information, and prices.

Expand paddy field: While commodity production and market are still developing, food production to meet household self-sufficiency demand is very important for households with (frequent) food insecurity problem. Conversion of existing upland field to paddy land as well as one crop paddy field to two crop fields could be useful to deal with the food shortage problem. It is, however, noted that realization of such plan largely depends on the local ability to improve the irrigation system.