

Risks of changing livelihoods to increase market orientation: Demand for credit, job training programs, and attitude toward environmental risks

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Summary of Findings

In this second document, we report on the results of a March 2008 survey randomly sampling 1165 individuals in three communes of Ha Tinh province, Vietnam. Male and female heads of households were interviewed separately. Appendices A and B provide additional descriptive statistics of the full sample. We asked a series of questions to assess the salience of various risks to this population (i.e. potentially important enough to change their behavior and likelihood of program participation), and whether or not these vary by target populations in a manner that might counter IFAD objectives.

This report examines the issues of gender, income, and food security regarding credit, labor, and the environment. Additional comparisons are made between coastal, Catholic populations and non-religious, inland populations. The survey asked a series of questions ranging from previous loan history to outlook on the environment. Together with the information on gender, income, and other behavioral characteristics we were able to examine these factors and their impact on an individual's demand for credit, job/skills training workshops, and how individuals view and respond to environmental changes.

Some of our initial findings:

Credit Demand

1. Men and women living in dual-led households disagree as to who controls the loans that are obtained. 38% of men think husbands control the loan, and only 13% of women agree. Conversely, 43% of women think the wife controls the loan and only 18% of men agree. This disagreement exists across all levels of household wealth, and is greatest with higher levels of income. As expected, the proportions of men and women that feel that the couple controls the loans together are similar (43/42%).
2. Both men and women tend to prefer group loans that require neither collateral nor savings to individual loans which impose these requirements. Most respondents would also trade larger loans for smaller ones with lower interest rates. There is, however, some disagreement between genders; women are likely to prefer smaller loans without savings requirements, while men are likely to prefer larger loans with savings requirements.

3. When asked about willingness to take out a loan under their own name, significantly more men than women, at all levels of income, responded affirmatively.

Labor/Job Training

4. When asked if they will participate in a training course in the commune, over 90% said that they plan on participating and will enroll in the course. However, when asked if they had participated in a job training/skills workshop previously only 41% said they had. Below-average income respondents were the least likely to enroll in these training programs.
5. Regardless of income, both women and older individuals (46-65 years old) were significantly more likely to have participated in a job/skills training program in the previous year. *Younger, below-average income respondents were the least likely to have participated in these training programs.*
6. The most popular types of job training programs for both men and women were the programs on planting and livestock techniques.
7. The majority of both men and women expressed a preference for longer training programs that had guaranteed jobs rather than shorter programs with no job guarantee. They were also more likely to prefer programs to which they were invited, even if it was more difficult for them to exit these programs.

Our research examines the extent to which considerations other than economic constraints are implicated in participation choices, and in particular, whether risk perceptions and other attitudinal factors are at play. We assess both general attitudes towards risk, as well as perceptions of five specific risks. Of the five, respondents are most concerned about low production due to bad weather.

Concern About Future Weather Conditions

8. 94% of all respondents noted significant changes in the weather in the past three years. When asked to indicate which future uncertainties concerned them the most, 69% of all respondents stated concern about future weather conditions. This is by far the most common concern within our sample.
9. Food insecurity is clearly associated with concern about future production and apprehension about the weather. Among the food insecure, 74% of the respondents were concerned about this problem, as opposed to only 59% among the food secure. This finding is true across risk attitudes and most income levels.
10. Levels of concern about future weather conditions also diverge between genders. 74% of women were concerned about bad weather, as opposed to only 64% of men. This difference in concern is consistent across levels of income and food security, but is more pronounced among the poor and food insecure.

11. Catholic and non-religious respondents are highly segregated, with 99% of all Catholics living in three Catholic-dominated, coastal villages. 19% of Catholics fish as a primary occupation, and they are the only respondents for whom fishing is a significant means of earning a living. *Because the coastal and Catholic sub-populations are essentially synonymous within our sample, all inferences pertaining to risk perceptions must be made with both of these factors in mind.*
12. The level of concern about future weather conditions diverges sharply between coastal Catholics and inland, non-religious respondents. Only 50% of coastal Catholics are concerned about bad weather, as opposed to 76% of non-religious respondents. This difference in concern holds true across risk attitudes and all income levels, but is greatest among the poor and among the risk-seeking. Similarly, the difference in concern holds across levels of food security, but is greatest among the food secure, with 69% of non-religious and only 36% of coastal Catholic respondents stating this as a concern.
13. While fishing as a living is highly associated with lower levels of concern about future weather conditions, this association does not fully account for the difference in concern between coastal Catholics and the non-religious. *Even though coastal populations are highly susceptible to extreme weather conditions, a significant difference in concern exists even when excluding fishing Catholics from the comparison altogether.* Non-fishing, coastal Catholics are 20% less likely than the non-religious to be concerned by this problem (56/76%).

Other Concerns About Future Conditions

14. 18% of respondents stated they were concerned about future health problems. Only 15% of the food secure were likely to be concerned, as compared to 20% of the food insecure.
15. 28% of all respondents stated a concern about low production due to pests. 30% of the food insecure are concerned about pests, as compared to 24% of the food secure.
16. 30% of all respondents stated concern about low production due to the possibility of livestock disease. 34% of the food insecure state a concern for this problem, as opposed to only 21% of the food secure. This difference in concern holds across risk attitudes and income levels, and is greatest among the poor and among the risk-averse.
17. The level of concern about livestock disease is once again different between coastal, Catholic respondents and non-religious, inland respondents. Whereas coastal Catholics were previously found to be less concerned about climate change, they are found here to be somewhat *more* concerned about livestock disease. The level of concern is 35% among coastal Catholics, as opposed to 28% among non-religious, inland respondents.

18. The least common concern mentioned within the commune related to low profits because of unfavorable prices. 13% of respondents stated this problem as a concern. This problem is the one instance where the food secure are in general more concerned than the food insecure. Among the risk-seeking this difference is even greater, as 22% of the food secure are concerned, as opposed to only 12% among the food insecure.

1. Introduction

This report continues the work begun in the first document submitted to IFAD on December 15th, 2008. That report examined the risks individuals face with increasing levels of market orientation. This section explores the challenges of getting individuals to change their livelihoods by accessing credit, undertaking a job/skills workshop, or reacting to environmental changes. By increasing their level of market orientation, individuals expose themselves to a variety of new risks from either participating in or foregoing various opportunities.

We concern ourselves, then, with the extent to which prospective program participants perceive these risks, and explore the demographic factors associated with their levels of concern. Identifying the groups most likely to have these concerns could provide valuable insight into the tailoring of programs to better suit the needs of future participants and to increase participation rates. We first explore the characteristics of programs most preferred by current and prospective participants, then assess the risk attitudes of these participants.

2. Methods

We undertook a survey of 1165 individuals in 637 households in three communes of Ha Tinh province in March 2008. Male and female heads of households were interviewed separately. Appendices A and B provide additional descriptive statistics of the full sample. We asked a series of questions to assess the salience of various risks to this population (i.e. potentially important enough to change their behavior and likelihood of program participation), and whether or not these vary by target populations in a manner that might counter IFAD objectives. In this analysis we first examine demand for and use of these programs, and follow by addressing perceptions of general and specific risks, chiefly pertaining to weather-related uncertainties. We compare these factors across a number of characteristics, including gender, age, income level and religious belief.

2.1. Borrowing Behaviors and Preferences

In order to determine factors which might make loans more desirable to future participants, respondents were asked a number of questions pertaining to their borrowing behaviors and preferences. The relative preferences of different types of loans were assessed by asking the respondents which of two loans they would prefer, and repeating this comparison for a number of different loan pairs. Some examples of such comparisons are shown below in **Table 1**.

Table 1: Comparing preferences of loans with different characteristics

Comparisons	Characteristics of Loans	
Comparison A	A large loan at the market interest rate	A small loan at a cheaper interest rate
Comparison B	An individual loan that requires collateral	A group loan with at least 50% women but without collateral
Comparison C	A large loan but you are required to save 200,000 VND	A small loan but you are not required to save

The preferences among these various loan comparisons are then compared between genders and across income levels. Additionally, respondents who had taken out loans were asked who (husband or wife) in their household had control over the loan, and whether or not they had trouble repaying the loan.

2.2 Participation and Demand for Training Programs

In order to measure the use of job/skills training programs, respondents were then asked if they had participated in any programs during 2006-2007. The rate of use of these programs was then compared across genders and age groups. To gauge the demand for specific programs, respondents were asked: “What do you want to learn?” The free responses to this query were then tallied within 15 categories. The demand for five such specific training programs is compared across genders in section 3.4 of this report. These programs are:

1. Planting techniques
2. Livestock techniques
3. Aquaculture
4. Job skills
5. Mechanic

In order to compare the level of demand across broad categories of training programs, respondents were asked to choose between two programs with different characteristics. These comparisons account for location, duration, cost and subject of training programs. This analysis includes a comparison of gender preferences across income levels for either job skills or market awareness training programs.

2.3 Perceptions of Risk

Individuals make decisions based on their perceived (subjective) risk of the various outcomes. Risk perceptions are influenced by the statistical risk of objective outcomes, as well as by risk orientation and attitudes, which are the individual’s innate or conditioned preference for risk taking¹. Perceived risk is also known to be influenced by a suite of qualitative dimensions, including: reversibility, proximity (immediate versus delayed); variability or distribution of impacts across time (chronic versus catastrophic), familiarity or

¹ Gigerenzer, G., Selten, R. (Eds.), 2001. *Bounded Rationality - The Adaptive Toolbox*. The MIT Press, Cambridge, MA.

dread; and control (voluntary versus involuntary)². Evidence from numerous experiments, largely in the U.S. and Europe, suggests that individuals regularly overestimate the risk of small, dreaded, unfamiliar and involuntary events, and that reference levels are fundamentally important to behavior under risk: individuals are loss averse (losses hurt more than commensurate gains help) and are more risk seeking over losses than gains (they are willing to take larger gambles to avoid losses than to acquire potential gains)³.

2.3a. General Risk Attitudes

In order to assess their general willingness to engage in behavior where risk is involved, all respondents were asked how they would respond to three sets of options involving varying hypothetical amounts of money and varying levels of risk. In each case they were presented with two options: one with a guaranteed outcome and one in which the outcome was determined after flipping a coin. The scenario used in this analysis was constructed to assess the respondents' willingness to take a fair gamble over gains, and is shown in **Table 2**.

Table 2. Tossing a Coin: Options to Assess Risk Attitudes

Option A	Option B	Responses	
		Option A	Option B
Receive VND 10,000 for sure	Heads: Nothing Tails: Receive VND 20,000	600	565

In this scenario, option A clearly signifies risk averse behavior, while option B signifies risk seeking behavior. Responses to this question are taken as a measure of general risk attitude.

2.3b. Perceptions of Certain Risks and Uncertainties

Perceptions of particular risks were measured by free responses to one question asked of all participants in the survey. The question asked simply: "What are the things that you worry about?" Respondents then freely stated their responses, which were tallied within six groups:

1. Health problems
2. Low production because of the weather
3. Low production because of pests
4. Low production because of livestock disease
5. Low profits because of prices
6. Other

This analysis uses the response rates for risks 1-5 as listed above as indicators of concern within the survey sample, as well as to make inferences about risk perceptions among the greater population within central Vietnam. These risk categories broadly represent risks

² Fischhoff, B.S.P., Lichtenstein, S., Read, S., Combs, B., 1978. "How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits." *Policy Sciences* 9, 127-152.

³ Simon, H.A., 1955. "A behavioral model of rational choice." *Quarterly Journal of Economics* 69, 99-118.

present in both natural systems (health, weather, pests, disease) and within the market itself (prices). By far the most common concern within the sample is “low production because of the weather,” with 69% of respondents freely stating this as a concern. The primary focus of this analysis is on concerns about future weather conditions and is included in section 4 of this report. The other concerns listed above (aside from “other”) are addressed in section 5.

3. Credit and Training Programs

Typically, and not unreasonably, we assume that if individuals are offered opportunities to improve their livelihoods, they will seize upon them. These opportunities can include training programs, access to credit, improved seed, new technologies, additional infrastructure etc. A key issue for development interventions is the identification of which “constraints” to remove under what conditions, or how to structure incentives to encourage household resources to be employed in a manner that reduces poverty and vulnerability.

Because some of the individuals who stand most to benefit from these programs are often the ones not taking advantage of them, we set out to assess the divide between program need and program demand. This was the focus of our 1st Technical Report, and will continue to be a focus within this report. Additionally, we address the divide between stated demand for these programs and the actual use of the programs.

3.1. Credit Programs

The issue of credit, particularly in rural areas, has been a subject of much debate in the past decade. Rural credit demand is often particularly strong due to the nature of the rural economy with capital constraints on agricultural production and the need for consumption smoothing (the ability to maintain a consistent level of consumption throughout the year)⁴. Despite this demand, many rural inhabitants remain credit-constrained due to poorly functioning credit markets, a lack of credit suppliers, little collateral and interest rates so high that securing a loan is beyond the reach to most^{5,6}.

Many farmers suffer from capital constraints, and accessible credit would enable farmers to purchase more productive and potentially more profitable technology or inputs^{7,8}. Credit also allows for consumption smoothing and can serve as a risk-coping strategy for many farmers⁹. Without access to credit, many farmers may hesitate even more to alter their farming techniques.

⁴ Zeller, M., Sharma, M. 1998. *“Rural Finance and Poverty Alleviation.”* Food Policy Report 8, International Food Policy Research Institute (IFPRI).

⁵ Besley, T. 1994. *“How Do Market Failures Justify Intervention in Rural Credit Markets?”* World Bank Research Observer. 9:1, 27-47.

⁶ Freedman, P. 2004. *“Designing Loan Guarantees to Spur Growth in Developing Countries.”* U.S. Agency for International Development (USAID). Office of Development Credit.

⁷ Zeller, M., Sharma, M. 2000. *“The Demand for Financial Services by the Rural Poor.”* Rural Financial Policies for Food Security of the Poor. Policy Brief No. 1.

⁸ Pitt, M., Khandker, S. 1996. *“Household and Intrahousehold Impact of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh.”* World Bank, Discussion Paper no. 320

⁹ Khandker, S., Chowdbury, O. 1996. *“Targeted Credit Programs and Rural Poverty in Bangladesh.”* World Bank, Discussion Paper no. 336

A new area of exploration is to examine credit and its impact on intra-household dynamics surrounding an individual's participation in a credit program¹⁰. Research to date has identified significant gender differences in responses to participating in a credit program. Our findings indicate that there are also gendered differences regarding issues such as who controls the loan, whether or not the individual would like to take a loan out in his or her name, and what types of loans men and women find most appealing. The findings also show that, along with gender, low-income individuals often respond differently than average or above average income individuals might. All of these data could be very useful for guiding future development projects in determining appropriate interventions, program design, and eventual implementations.

3.2. Gender Perceptions of Loan Control

A key area of difference between men and women emerged when respondents were asked who was in control of the loans that had been taken out previously. Respondents who had taken out a loan before were asked about their credit history, including who was in control of the loan. Results in **Table 3** show that men and women living in dual-led households have very different opinions about this. Within this sample (n = 522), males are 25% percent more likely than females to respond that the husband controls the loan (38/13%), while females are 25% more likely than males to respond that the wife controls the loan (43/18%).

Table 3. Proportion of individuals in dual-led households that took a loan who state the husband, wife, or couple controls the loan***

		Male (%)	Female (%)	Total (%)
Person controlling the loan	Husband	38	13	25
	Wife	18	43	31
	Husband and Wife Together	43	42	43
	Other	2	2	2

Numbers may not add to 100% due to rounding

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 58.704$

This indicates a lack of communication within the household, which may in turn lead to worse outcomes for households with outstanding loans. Roughly the same percentage of males and females (43/42%) responded that the couple has joint control over the loan.

It is also useful to compare this difference in perception of control over the loan across income categories. The wealth of the household relative to commune average was indicated by the enumerator of the survey, and places each respondent into one of three categories: below average, average, and above average. The differences in the male and female responses as to who controls the loan are significant at all income levels in the sample, as indicated by **Tables 4** and **5**. At all income levels, men are more likely to think that husbands control the

¹⁰ Anderson et al. 2009. "Decision Making and Tensions between Gender and Market Approaches to Rural Development Policy." FAO-IFAD-ILO Workshop on Gaps, trend and current research in gender dimensions of agricultural and rural employment: differentiated pathways out of poverty. Rome, 2009.

loans. In general, men as a whole are predicted to be 17-32%¹¹ more likely than women to believe that the husband is in control of the loan. The opposite is true for females, who are predicted to be 18-33% more likely to believe that the wife controls the loan.

Table 4. Proportion of individuals in dual-led households that took a loan that claim that the wife controls the loan***

		Male (%)	Female (%)	Total (%)
HH Wealth	Below	23	43	34
Compared to	Average	17	43	31
Commune Avg.	Above	10	44	26
	Total	18	43	31

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 7.430$ (Below), $\chi^2 = 24.441$ (Average), $\chi^2 = 7.919$ (Above), $\chi^2 = 38.802$ (Total)

Table 5. Proportion of individuals in dual-led households that took a loan that claim that the husband controls the loan***

		Male (%)	Female (%)	Total (%)
HH Wealth	Below	39	13	25
Compared to	Average	34	13	23
Commune Avg.	Above	48	12	32
	Total	38	13	25

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 13.872$ (Below), $\chi^2 = 20.408$ (Average), $\chi^2 = 8.191$ (Above), $\chi^2 = 42.161$ (Total)

Interestingly, the perception among women as to who controls the loan is unrelated to income, whereas for men there is a significant relationship. The likeliness of husbands to state that the wife is in control of this loan is negatively associated with income. Not surprisingly, then, there is a positive correlation between income and male perception of husband-controlled loans. Above-average income males are 36% more likely than their female counterparts to believe themselves to be in control of the loan (48/12%).

3.3 Credit Demand

When designing a credit program it is important to understand that different populations prefer different types of loans. Men and women express different preferences for certain types of loans, such as loans that require collateral, group loans, and loans that require female participation. The survey design included a series of 5 questions with two options each, from which the respondents chose his or her preferred alternative.

¹¹ All intervals are at the 95% confidence level. We make inferences only about the overall population rather than for each sub-population being compared. For instance, in **Table 4**, the confidence interval applies only to the bottom “Total” row, while there is no inference stated within each particular income level. In cases where “Total” rows are the same from one table to the next, inferences about the greater population are not repeated. Graphical representations of two such inferences, comparing concern about health problems and weather conditions between the food secure and insecure, are shown in **Appendix D**.

From the data collected, we were able to tease out important differences in the choices of respondents based on variables such as gender and income. Our data indicate that the majority of both men and women prefer obtaining a smaller loan at a cheaper interest rate to obtaining a large loan at market rates. But, as the data in **Table 6** also show, significantly more women than men prefer this option, at all levels of income. Women in general are 14-24% more likely to prefer these smaller, cheaper loans. Within the sample, low income and average income women prefer this type of loan 20% more than their male counterparts (86/66% and 78/58%, respectively). Thus, while almost 75% of respondents overall chose the small loan with a lower interest rate option, these data also illustrate that women are much more averse than men to obtaining a large loan at market rates.

Table 6. Proportion of men and women that chose a smaller loan at a cheaper interest rate rather than a large loan at market rates

		Male (%)	Female (%)	Total (%)
HH Wealth	Below***	66	86	78
Compared to	Average***	58	78	70
Commune Avg.	Above	65	73	69
	Total***	61	80	72

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 20.6$ (Below), $\chi^2 = 32.0$ (Average), $\chi^2 = 51.2$ (Total)

Another comparison researchers proposed to respondents was to choose if they preferred a group loan with a requirement that at least 50% of members be female but no requirement of collateral over an individual loan requiring collateral. The findings indicate that a majority of both males and females prefer the group option as opposed to the individual loan requiring collateral. **Table 7** indicates that while a majority of both men and women prefer the group option, women are predicted to be 10-21% more likely than men to prefer this option. Within the sample, women at all levels of income prefer this option more than men. Two-thirds of all respondents surveyed preferred the group loan to the individual loan.

Table 7. Proportion of men and women that chose a group loan with at least 50% women but no collateral as opposed to an individual loan that requires collateral

		Male (%)	Female (%)	Total (%)
HH Wealth	Below***	60	79	71
Compared to	Average***	55	70	63
Commune Avg.	Above	62	70	66
	Total***	57	73	66

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 15.1$ (Below), $\chi^2 = 16.8$ (Average), $\chi^2 = 31.6$ (Total)

Next, respondents were asked if they preferred obtaining a group loan with at least 50% poor members but no collateral or an individual loan requiring collateral. Once again, just as in **Table 7**, a majority of both men and preferred the group loan option over receiving an individual loan with women being more in favor of this option than men. Women in general are predicted to be 6-17% more likely than men to prefer these group loans. This result is true at all income levels in the sample, but especially for men and women from low-income

households where 85% of low-income women and 73% of low-income men chose the group loan. This is in stark contrast to the 55% of average income men and 71% of average income women who preferred the group loan (See **Table 8** below).

Table 8. Proportion of men and women that would prefer a group loan with at least 50% poor but no collateral as opposed to an individual loan that requires collateral

		Male (%)	Female (%)	Total (%)
HH Wealth	Below***	73	85	80
Compared to	Average***	58	71	65
Commune Avg.	Above	62	64	63
	Total***	63	75	69

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 7.9$ (Below), $\chi^2 = 12.1$ (Average), $\chi^2 = 18.7$ (Total)

Respondents were also asked if they preferred a small loan that did not include a requirement to save or a large loan with a savings requirement of 200,000 VND. The findings from **Table 9** show a majority of women preferring the small loan with no savings requirement. Women in general are predicted to be 10-22% more likely than men to prefer this smaller loan. This finding is consistent among the majority of low-income respondents, but not among the majority of men. Only 40% of male respondents chose the small loan without a savings requirement, as compared to 56% of total female respondents. Significantly more men than women were seen preferring the large loan that had a savings requirement of 200,000 VND. According to the data, it appears that women may be more uncomfortable with taking out a large loan than men, or are more averse than men to the mandatory savings requirement.

Table 9. Proportion of men and women that would prefer a small loan without a requirement to save rather than a large loan with a savings requirement of 200,000 VND

		Male (%)	Female (%)	Total (%)
HH Wealth	Below***	42	67	57
Compared to	Average***	39	50	45
Commune Avg.	Above**	37	58	48
	Total***	40	56	49

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 21.5$ (Below), $\chi^2 = 7.1$ (Average), $\chi^2 = 5.9$ (Above), $\chi^2 = 29.5$ (Total)

For the final option, respondents were asked if they preferred a group loan without collateral but a savings requirement of 200,000 VND or an individual loan that required collateral but did not require savings. Once again, **Table 10** shows that the group loan was preferred by a majority of both male and female respondents rather than the individual loan option. Both men and women also preferred the option that did not require collateral.

Table 10. Proportion of men and women that would prefer a group loan without collateral that requires each member to save 200,000 VND rather than an individual loan that requires collateral but does not require savings

		Male (%)	Female (%)	Total (%)
HH Wealth	Below**	67	77	73
Compared to	Average***	56	68	62
Commune Avg.	Above	60	57	58
	Total***	60	69	65

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 4.2$ (Below), $\chi^2 = 9.6$ (Average), $\chi^2 = 29.5$ (Total)

Women in general are predicted to be 4-15% more likely than men to choose this group loan option over the individual loan option. Women consistently preferred this group loan option more than among below and average income respondents. Below-average income females are 10% more likely to choose the group loan option than below average males (77/67%). Likewise, average-income females are 12% more likely to choose the group loan than their male counterparts (68/56%).

In terms of program design, the data indicate that group loans tend to be more preferred than individual loans. Both low-income individuals and women, the populations generally targeted by most microfinance programs, have a strong preference for group loans and loans that do not require collateral. Women are, in general, more risk-averse than men, which could explain why women generally prefer these safer, smaller, group loans significantly more than men prefer them¹².

3.4 Labor/Job Training

Poor functioning markets are often present in the impoverished parts of the developing world. This lack of well-functioning markets affects the efficient allocation of all resources from food and credit to labor. In developing countries there is often a high level of unemployment for unskilled workers. At the same time, there is a demand by the industry and service sectors for skilled labor that is often unmet, indicating significant room for employment growth¹³. In order to help combat chronic unemployment, governments and NGOs have begun to offer job training/skill workshops in the hopes of retooling and educating workers both for jobs in the new economy, but also regarding new farming techniques. The survey asked respondents about their interest in participating in these types of programs and what types of skills they wanted to learn most.

When asked if respondents were willing to participate in a job skills/training workshop if it were held in the commune that year, the overwhelming response was “yes.” At all income

¹² Anderson et al. 2009. “Decision Making and Tensions between Gender and Market Approaches to Rural Development Policy.” FAO-IFAD-ILO Workshop on Gaps, trend and current research in gender dimensions of agricultural and rural employment: differentiated pathways out of poverty. Rome, 2009.

¹³ World Bank. World Development report 2008: Agriculture and Development. World Bank Publications. 2008.

levels and across gender there was a high indication that people were demanding an increase in skills education, with around 90% of respondents saying they would participate.

Information was also collected about their previous labor/job training history. Although 90% of individuals claimed they wanted to participate in a job skills training workshop that year, a significantly smaller amount had participated in a job skills program the previous year. **Table 11** shows that much fewer than 90% of respondents previously participated in job training. Only 33% of men and 47% of women had previously participated. Within the greater population, women are predicted to be 8-19% more likely than men to have participated in such training programs.

Table 11. Proportion of respondents who participated in a job/skills training program the previous year

		Male (%)	Female (%)	Total (%)
HH Wealth	Below***	26	44	36
Compared to	Average***	34	48	42
Commune Avg.	Above	50	52	51
	Total***	33	47	41

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 12.1$ (Below), $\chi^2 = 14.5$ (Average), $\chi^2 = 23.0$ (Total)

In terms of income and gender, below-average males were least likely to have participated in a job/skills training program the previous year than any other sub-population. In fact, low-income individuals had the lowest percentage of those participating in job training classes with only 36% of that group responding affirmatively compared to 42% of average-income respondents. The group that could potentially receive the greatest benefit from participating in a job/skills training program in fact was the least likely in the total sample to have done so.

Age was also an important indicator as to the likelihood of prior participation in a job/skills training program. One might expect that the youngest and poorest individuals in the population would be the most likely to have participated in a job-training program due to the high marginal benefits of participating, but as **Table 12** indicates the opposite is occurring within our sample.

Table 12. Percentage of people who participated in a job/skills training program last year by income and age group (n=1154)

		Youth (20-30)	Middle (31-45)	Older (46-58)	Total
HH Wealth	Below**	28	34	52	36
Compared to	Average***	35	38	57	42
Commune Avg.	Above***	40	43	74	52
	Total***	32	38	58	41

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 7.9$ (Youth), $\chi^2 = 17.6$ (Middle), $\chi^2 = 10.1$ (Older), $\chi^2 = 37.5$ (Total)

The data show that below income youths are the least likely to have previously participated in a job/ skills training program though in theory they have the most to gain. In fact, the opposite was true with older, above-average income individuals being the most likely to have participated in a job-training course. The youth population (ages 20-30) is predicted to be 16-36% less likely than the older population (46-58) to have participated in these training programs in 2007.

3.5. Job Training Demand and Preferences

As part of the survey, individuals were also asked about what types of training they were most interested in. Not surprisingly, since most respondents are farmers, the most popular types of training demanded revolved around the agricultural industry. Gender differences were notable for certain types of trainings being demanded. As **Table 13** illustrates, the two single largest requests by both men and women pertained to planting and livestock techniques.

Table 13. Proportion of respondents stating interest in learning various skills

		Male (%)	Female (%)	Total (%)
Skills you want to learn	Planting Techniques***	45	58	52
	Livestock Techniques***	73	84	79
	Aquaculture***	10	4	7
	Job Skills**	5	2	3
	Mechanic***	5	0	2

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 17.3$ (Planting Techniques), $\chi^2 = 22.0$ (Livestock), $\chi^2 = 19.4$ (Aquaculture), $\chi^2 = 5.7$ (Job Skills), $\chi^2 = 30.3$ (Mechanic)

There are significant differences in the margins by which men and women preferred certain types of trainings. Eighty-four percent of females compared to 73% of males said they wanted to learn livestock techniques. A higher proportion of women also wanted to learn planting techniques than men (58/45%). On the other hand, a greater proportion of men than women wanted to learn aquaculture, job skills, and mechanic training. Although only a tiny percentage of total respondents said they wanted to learn these skills, men were far more interested than females in these types of training programs.

Similar to the section on credit, the survey also asked a series of questions that made the respondents choose between two options about different types of job programs. We found that 58% of both men and women responded that they would rather participate in a long training at a company with a guaranteed job rather than a short job skills training program at the commune without a guaranteed job.

Furthermore, a job training session that is free and at the commune is much more desirable than a paid training course held at the village. This option was popular across incomes and genders with 75% of men choosing this option and 70% of women. Cost appears to be an important factor for surveyed individuals when deciding whether or not to participate in a job-training course.

The only choice that contained any significant differences in the preferences between men and women was between a job skills training course and market awareness/knowledge training course. Women in general are predicted to be 3-13% more likely than men to prefer job skill training. At all levels of income, women in the sample preferred the job skills training option more than men. **Table 14** shows that significantly more average-income females preferred the job skills training course than average income males (72/62%).

Table 14. Proportion of men and women preferring a job skills training course rather than a market awareness/knowledge training

		Male (%)	Female (%)	Total (%)
HH Wealth	Below	75	79	77
Compared to	Average***	62	72	67
Commune Avg.	Above	62	72	67
	Total***	66	74	70

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 6.5$ (Average), $\chi^2 = 17.3$ (Total)

Our survey also indicated that respondents significantly preferred a job skills training to which they are invited over programs for which they had to apply, even if invitation-based programs are harder to get out of. 62% of men and 56% of women chose this option.

4. Climate change and future uncertainty

Being a largely coastal nation, Vietnam is particularly susceptible to natural disasters, including typhoons and tropical storms, as well as floods, droughts, landslides and earthquakes, and among the five coastal, developing nations, is the most affected by increases in sea levels¹⁴. Over 70% of Vietnam’s population is at risk from these disasters, particularly the poor. Furthermore, these weather conditions are expected to increase in both intensity and frequency as a response to global patterns of climate change¹⁵. While Vietnam’s population is familiar with extreme weather systems, rural areas are more disaster-prone because of both their dependence on the environment itself as well as their isolation from outside sources of aid. The poor are also generally less informed of the implications of climate change.

Our findings show that 94% of all respondents noticed significant changes in the weather in the past three years, though this does not speak directly to the level of concern about climate change. When asked to list which future uncertainties trouble them the most, however, 69% of respondents were concerned about low production due to unfavorable weather conditions. Other concerns included health problems (18%), low production due to pests (28%) and livestock disease (30%), and low profits due to unfavorable prices (13%).

¹⁴ Dasgupta, S, B. Laplante, C. Meisner, D. Wheeler, and J. Yan. 2007. *“The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis.”* World Bank Policy Research Working Paper 4136, Washington, DC.

¹⁵ Nguyen Huu Ninh, et al. 2008. *“Flooding in Mekong River Delta, Vietnam”* Human Development Report Office, United Nations Development Programme

4.1 Food security

Agriculture is highly vulnerable to climate change, due not only to greater extremes in both high and low temperatures, but also to changes in precipitation¹⁶. Furthermore, coastal agricultural regions are particularly susceptible to saline intrusion, even tens of kilometers inland¹⁷. Those who depend on agriculture for day-to-day nourishment therefore constitute a group of particular concern regarding future impacts of climate change.

The food insecure in our sample are in general significantly more concerned about future weather conditions. The survey asked respondents: “During 2007, were you always able to afford the healthy food you wanted for your family?” A “No” response to this question is interpreted as an indication of food insecurity. The food secure population as a whole is predicted to be 9-20% more concerned than the food insecure population. As **Table 15** shows, this difference in the level of concern continues to be significant between these groups when controlling for risk attitude. The predicted level of concern among the greater population is shown graphically as an example in **Appendix D**.

Table 15. Proportion of individuals concerned about low production due to bad weather

		Food Secure (%)	Food Insecure (%)	Total (%)
Risk Attitude	Risk Averse**	63	74	71
	Risk Seeking***	56	74	68
	Total***	59	74	69

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 6.83$ (Risk Averse), $\chi^2 = 18.384$ (Risk Seeking), $\chi^2 = 24.535$ (Total)

This difference is greatest among the risk seeking, with food secure respondents being 18% less likely to be concerned than the food insecure (56%/74%). Food secure respondents are also significantly less concerned than the food insecure within most income levels, as shown by **Table 16**. The difference in concern also tends to widen as income goes up. While there is no significant difference among below-average income respondents, the food secure are 14% less likely to be concerned than the food insecure among average-income respondents (59/73%) and 25% less likely among above-average income respondents (53/78%).

Table 16. Proportion of individuals concerned about low production due to bad weather

		Food Secure (%)	Food Insecure (%)	Total (%)
HH Wealth Compared to Commune Avg.	Below	68	73	73
	Average***	59	73	68
	Above***	53	78	66
	Total***	59	74	69

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 15.465$ (Average), $\chi^2 = 8.332$ (Above), $\chi^2 = 24.535$ (Total)

¹⁶ Chaudhry, P., and G. Ruysschaert. 2007. “Climate Change and Human Development in Viet Nam.” UNDP Occasional Paper, Virginia.

¹⁷ Asian development Bank. 2009. “The Economics of Climate Change in Southeast Asia: A Regional Review.” Mandaluyong City, Philippines: Asian Development Bank.

An interesting note is that the level of concern among the food insecure is not associated with income. Concern among the food secure is, however, associated with household wealth, and is inversely related to income.

4.2 Gender

The level of concern about future weather conditions also differs by gender. Women, on the whole, are predicted to be 5-16% more likely than men to be concerned about this problem. As shown in **Table 17**, this finding holds true across the below- and average-income households. Women are 13% more likely to be concerned than men among below-average income respondents (78/65%) and 9% more likely among average-income respondents (72/63%), while no significant difference is observed among above-average income respondents. Interestingly, the level of concern among men is consistent across income levels, while for women this concern increases significantly with lower levels of income.

Table 17. Proportion of individuals concerned about low production due to bad weather

		Male (%)	Female (%)	Total (%)
HH Wealth Compared to Commune Avg.	Below***	65	78	73
	Average***	63	72	68
	Above	63	69	66
	Total***	64	74	69

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 7.686$ (Below), $\chi^2 = 6.813$ (Average), $\chi^2 = 14.102$ (Total)

This observation leads us to an interesting conclusion. In several instances, income is associated with the level of concern among one group in the comparison, but not the other. In the food security comparison, the food insecure have a relatively high level of concern, regardless of their level of income. In the gender comparison, men have a somewhat lower level of concern than do women, regardless of their income. In the sample, the measured difference in concern increases with income when comparing the food secure and insecure, and decreases with income when comparing across genders. We cannot, therefore, say that income has a consistent relationship to the difference in concern about bad weather, but rather, the relationship depends on the groups being compared.

Table 18. Proportion of individuals concerned about low production due to bad weather

		Male (%)	Female (%)	Total (%)
Food Security	Secure***	50	67	59
	Insecure**	70	77	74
	Total***	64	74	69

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 10.309$ (Food Secure), $\chi^2 = 4.486$ (Food Insecure), $\chi^2 = 14.102$ (Total)

This gender difference also remains when controlling for food security. **Table 18** shows that the difference is greatest among the food secure, with female respondents being 17% more likely to be concerned about future weather conditions than men (67/50%). Among the food insecure, female respondents are only 7% more concerned than their male counterparts

(77/70%). This table also confirms our previous finding that the food insecure are much more likely to be concerned about bad weather than the food secure.

4.3 Religion and Coastal Habitation

Despite a historically slower development of climate change awareness within Catholic communities, numerous efforts have recently been underway within the Catholic Church to address this potential threat head-on^{18,19,20}. Within developing nations the Catholic population has been shown to outpace those of other religious sects in their response to weather-related problems, being proactive rather than fatalistic²¹. This leads us to wonder to what extent this is true in our sample from Ha Tinh Province.

As such, another interesting comparison can be made regarding the level of concern and the religion of the respondent. Of the 1165 respondents in the survey, 289 (24.8%) are Catholic, only 2 (0.2%) are Buddhist, and 874 (75%) are not religious. For the sake of simplicity, we compare only the Catholic and non-religious sub-populations, leaving the two Buddhist respondents out of the comparison. Catholic respondents are also, on the whole, segregated from the rest of our sample, living almost exclusively in three villages on the eastern coast of the country. We can say, then, that Catholicism and coastal inhabitation are essentially synonymous within our sample. *Any inferences made about risk perceptions within this subpopulation must therefore be made with both of these factors (religious belief and geographic location) in mind.* The characteristics of these villages will be discussed in detail in section 4.4.

There are striking differences in the level of concern about future weather conditions between coastal Catholics and the non-religious, as shown in **Table 19**. Coastal Catholics on the whole are predicted to be 19-32% less likely to be concerned about future weather conditions than the non-religious, inland population. Risk-averse Catholics are 23% less likely to be concerned than the non-religious (55/78%), and risk-seeking Catholics are 33% less likely (41/74%).

Table 19. Proportion of individuals concerned about low production due to bad weather***

		Catholic (%)	Not Religious (%)	Total (%)
Risk Attitude	Risk Averse	55	78	71
	Risk Seeking	41	74	68
	Total	50	76	69

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 35.150$ (Risk Averse), $\chi^2 = 42.573$ (Risk Seeking), $\chi^2 = 67.862$ (Total)

¹⁸ Vischer, L. 1997. "Climate Change, Sustainability and Christian Witness" The Ecumenical Review. 49:2, 142-161

¹⁹ Hallman, D. 1997. "Ecumenical Responses to Climate Change: A Summary of the History and Dynamics of Ecumenical Involvement in the Issue of Climate Change" The Ecumenical Review. 49:2, 131-141

²⁰ USCC Committees on Domestic and International Policy. 2001. "Global Climate Change: A Plea for Dialogue, Prudence, and the Common Good" United States Conference of Catholic Bishops (USCC).

²¹ Schipper, E. Lisa F. 2006. "Climate Risk, Perceptions, and Development in El Salvador" Tyndall Centre for Climate Change Research. International Water Management Institute. Colombo, Sri Lanka

In keeping with our previous findings, the level of concern is in general greater among the risk averse than it is for the risk seeking. The level of concern among Catholics is highly associated with risk attitude, while the level of concern among the non-religious does not vary with risk attitude.

This difference in concern between Catholics and the non-religious is consistent across income levels, though not significantly for above-average income households. **Table 20** shows Catholic respondents to be 18% less likely to be concerned than non-religious respondents, within below-average income households (58/76%), and 32% less likely within average-income households (44/76%).

Table 20. Proportion of individuals concerned about low production due to bad weather

		Catholic (%)	Not Religious (%)	Total (%)
HH Wealth Compared to Commune Avg.	Below***	58	76	73
	Average***	44	76	68
	Above	59	69	66
	Total***	50	76	69

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 10.292$ (Below), $\chi^2 = 61.140$ (Average), $\chi^2 = 67.862$ (Total)

Food security once again plays an important role in predicting the level of concern about future weather conditions. **Table 21** confirms that the food insecure are much more concerned, and that Catholics are in general less concerned, regardless of food security.

Table 21. Proportion of individuals concerned about low production due to bad weather***

		Catholic (%)	Not Religious (%)	Total (%)
Food Security	Secure	36	69	59
	Insecure	58	79	74
	Total	50	76	69

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 33.923$ (Food Secure), $\chi^2 = 31.297$ (Food Insecure), $\chi^2 = 67.862$ (Total)

While food security is highly associated with lower levels of concern among both Catholics and the non-religious, the decrease in concern is more dramatic among Catholics. The difference in the level of concern between these groups increases, therefore, with food security, with Catholics being 33% less likely to be concerned than the non-religious (36/69%). Among the food insecure, Catholics are still 21% less likely to be concerned than the non-religious(58/79%).

4.4 Catholic, Coastal Populations

It is worth exploring the fact that the Catholic and non-religious populations are highly segregated from one another. Because the development of Catholicism in Vietnam was subject to the coastal routes traveled by missionaries since the early 17th century, the

distribution of Catholics within Vietnam is unevenly distributed²². Nearly all of the 289 Catholic respondents live in three coastal villages, where there are virtually no non-religious respondents²³. This allows for the possibility that some of the associations found between Catholics and the non-religious could be explained by other factors, including geographic region and livelihood.

To explore this possibility, we first look within the sample of Catholic respondents. To ascertain occupational characteristics, respondents were asked: “what is your main occupation?” Because the Catholic villages are all located on the coast it is not surprising that a significant number of Catholic respondents (19%) state fishing as their primary source of income. Furthermore, all respondents who fish as a primary occupation are from these coastal villages and are Catholic, so coastal fishing can be said to be an entirely Catholic trait within this sample²⁴. However, many of the 289 Catholics are not fishers (235), so we can compare these two groups to look for important differences.

Inhabitants of Vietnam’s coastal regions are susceptible to climate change, whether farming or fishing. Agriculture populations stand to be affected by climate change, due to, among other things, salinity encroachment into farmland. Coastal fishing, however, would likely suffer from fish migration, lower body mass of fish that are caught, and lower overall proportions of valuable, sub-tropical fish within fish catches²⁵. Coastal inhabitants in our sample (approximately 80% of whom farm or fish) are then presumed to all have some reason to be concerned about future climate change.

Fishing Catholics are significantly less likely than non-fishing Catholics to be concerned about bad weather. The fishing, Catholic population is predicted to be 21-47% less concerned about this problem than the non-fishing Catholic population. As **Table 22** shows, this is statistically significant, despite the very low number of fishing respondents.

Table 22. Proportion of Catholics concerned about low production due to bad weather***

	Fishing Catholics	Non-fishing Catholics	Total
Concerned	12	132	144
Not concerned	42	103	145
Total	54	235	289
% Concerned	22%	56%	50%

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 20.242$

²² Embassy of Vietnam – Beliefs and Religions. http://www.vietnamembassy-usa.org/learn_about_vietnam/culture/beliefs_and_religions/

²³ 98% of Catholic respondents live in villages 9, 16, and 17. These villages are in turn 99% Catholic, so there is very little integration among these two groups.

²⁴ All 54 respondents stating fishing as a primary means of livelihood are also Catholic and living in villages 9, 16, 17.

²⁵ Chaudhry, P., and G. Ruyschaert. 2007. “Climate Change and Human Development in Viet Nam.” UNDP Occasional Paper, Virginia.

There are a number of other factors which might explain the difference in concern noted above. The most striking difference between these two groups arises from the fact that the vast majority of those fishing are male (91%). Among non-fishing Catholics, however, only 36% are male, so there is a clear tendency for men to fish and for women to do other things (primarily farming). As men were noted earlier to be significantly less concerned than women about bad weather, we might expect this high gender-correlation to explain the difference in concern between fishing and non-fishing Catholics. **Table 23** shows, however, that the level of concern is significantly different, even when controlling for gender, with fishing, Catholic men being 33% less likely to be concerned than non-fishing, Catholic men (22/55%). The same difference among women cannot be said to be significant due to the extremely low number of women who fish (only 5).

Table 23. Proportion of individuals concerned about low production due to bad weather

		Fishing Catholic (%)	Non-fishing Catholic (%)	Total (%)
Gender	Male***	22	55	43
	Female	20	57	56
	Total***	22	56	50

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 13.194$ (Male), $\chi^2 = 20.242$ (Total)

Another significant correlation exists between the fishing and non-fishing Catholic respondents, this time relating to food security status. Fishing Catholics are 12% more likely to be food secure than non-fishing Catholics (46/34%). Because food security is negatively associated with concern about low production due to bad weather, this fact could once again potentially explain the difference in concern between these two groups. **Table 24** shows, however, that the difference in concern between fishing and non-fishing Catholics is significant, even when controlling for food security.

Table 24. Proportion of individuals concerned about low production due to bad weather***

		Fishing Catholic (%)	Non-fishing Catholic (%)	Total (%)
Food Security	Secure	12	43	36
	Insecure	31	63	58
	Total	22	56	50

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 13.194$ (Food Secure), $\chi^2 = 10.132$ (Food Insecure), $\chi^2 = 20.242$ (Total)

It is also useful to compare once more the Catholic and non-religious respondents, this time omitting the fishing respondents from the comparison altogether to adjust for any other unforeseen biases. Farmers inhabiting coastal regions are highly susceptible to problems related to extreme weather such as salinity encroachment due to storm surges, and would therefore be expected to be concerned about these problems²⁶. Non-fishing Catholics are 20% less likely than the non-religious to be concerned about low production due to bad

²⁶ Nguyen Huu Ninh, et al. 2008. "Flooding in Mekong River Delta, Vietnam" Human Development Report Office, United Nations Development Programme

weather (56/76%). The difference in the level of concern between these groups is consistently significant when controlling for food security as well as risk attitude, as shown in **Table 25** and **Table 26**, respectively.

Table 25. Proportion concerned among non-fishing Catholics and the non-religious, controlling for food security***

		Non-fishing Catholic (%)	Not Religious (%)	Total (%)
Food Security	Secure	43	69	63
	Insecure	63	78	75
	Total	56	76	72

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 17.242$ (Food Secure), $\chi^2 = 16.220$ (Food Insecure), $\chi^2 = 34.419$ (Total)

Table 26. Proportion concerned among non-fishing Catholics and the non-religious, controlling for risk attitude***

		Non-fishing Catholic (%)	Not Religious (%)	Total (%)
Risk Attitude	Risk Averse	61	78	73
	Risk Seeking	47	74	70
	Total	56	76	72

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 15.133$ (Risk Averse), $\chi^2 = 24.144$ (Risk Seeking), $\chi^2 = 34.419$ (Total)

We conclude, therefore, that Catholics are significantly less likely to be concerned about future weather conditions than are the non-religious, whether or not we include fishing Catholics in the comparison. The difference in the level of concern can perhaps be explained to some extent by a number of factors, including gender and food security, but there are certainly other forces at work. A more advanced analysis using multivariate regression could help to isolate the degree to which Catholicism itself is a predictive factor in the level of concern about future weather conditions. We have included the initial results from such a regression in **Appendix C**.

5. Other Concerns of Future Uncertainty

Other concerns indicated by the survey include health problems, low production due to pests and livestock disease, and low profits due to unfavorable prices. Food security seems to be the primary dividing factor between the concerned and unconcerned respondents for all of these issues. As such, we compared the level of concern between the food secure and insecure for the additional concerns of future health problems, pests, livestock disease, and unfavorable prices.

5.1 Health Problems

While only 18% of all respondents were concerned about future health problems, the level of concern is once again higher among the food insecure. Only 15% of food secure respondents were likely to be concerned, as compared to 20% among food insecure respondents. The food insecure population as a whole is predicted to be 0.1%-9% more likely to be concerned for this problem than the food secure population. This difference in concern, while statistically significant, is so small in magnitude that it is not likely to be relevant to possible program responses. The predicted level of concern among the greater population is shown graphically as an example in **Appendix D**.

5.2 Pests

As **Table 27** shows, the food insecure are also more likely to be concerned about low production due to pests. The food insecure population is predicted to be 1-12% more likely to be concerned than the food secure population. This finding holds when accounting for the risk attitude of the respondent.

Table 27. Proportion of individuals concerned about low production due to pests

		Food Secure (%)	Food Insecure (%)	Total (%)
Risk Attitude	Risk Averse*	24	31	29
	Risk Seeking*	23	30	28
	Total**	24	30	28

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 2.876$ (Risk Averse), $\chi^2 = 2.909$ (Risk Seeking), $\chi^2 = 5.819$ (Total)

5.3 Livestock Disease

Similarly, the food insecure are more concerned about low production due to livestock disease, as shown in **Table 28**. The food-insecure population is predicted to be 7-18% more likely to be concerned than the food secure population. The difference in the level of concern between these two groups holds when accounting for risk attitude. The food insecure are 15% more likely to be concerned than the food secure among the risk-averse (33/18%) and 10% more likely among risk-seeking respondents (34/24%).

Table 28. Proportion of individuals concerned about livestock disease

		Food Secure (%)	Food Insecure (%)	Total (%)
Risk Attitude	Risk Averse***	18	33	29
	Risk Seeking**	24	34	31
	Total***	21	34	30

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 14.465$ (Risk Averse), $\chi^2 = 5.924$ (Risk Seeking), $\chi^2 = 18.951$ (Total)

This difference also holds when accounting for household wealth. As **Table 29** shows, the below-average income households have the lowest level of concern among the food secure (14%). The food insecure are 19% more likely to be concerned about livestock disease than

the food secure among below-average respondents (33/14%), and 12% more likely among average income respondents (34/22%).

Table 29. Proportion of individuals concerned about livestock disease

		Food Secure (%)	Food Insecure (%)	Total (%)
HH Wealth	Below***	14	33	30
Compared to	Average***	22	34	30
Commune Avg.	Above	23	36	30
	Total***	21	34	30

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 7.786$ (Below), $\chi^2 = 10.463$ (Average), $\chi^2 = 18.951$ (Total)

Comparing once more the level of concern between Catholics and the non-religious, we see that Catholics are somewhat more concerned about livestock disease, with 35% stating concern for this problem, as opposed to only 28% among the non-religious. The Catholic population is predicted to be 0.3-13% more likely to be concerned by this problem.

5.4 Poor Market Prices

There is one case where the food insecure are less likely to be concerned about uncertainty in future conditions. As **Table 30** shows, regarding low profits due to prices, the food insecure are significantly less concerned than the food secure. The food insecure population is predicted to be 1-10% less likely to be concerned than the food secure population. While this difference in concern is unlikely to be practically significant, the difference is greater among the risk-seeking, for which food insecure respondents are 11% less likely to be concerned than food secure respondents (11/22%). Within the greater risk-seeking population, the food insecure are predicted to be 5-18% less likely to be concerned than the food secure by this problem.

Table 30. Proportion of individuals concerned about low profits due to unfavorable prices

		Food Secure (%)	Food Insecure (%)	Total (%)
Risk Attitude	Risk Averse	11	12	12
	Risk Seeking***	22	11	15
	Total***	17	12	13

Findings are significant at *10%, ** 5%, *** 1%
 $\chi^2 = 13.913$ (Risk Seeking), $\chi^2 = 6.575$ (Total)

In most cases, concern is significantly greater among women, the food insecure, the poor, the risk averse, and the non-religious, inland population, but the extent to which this is the case, if at all, is subject to the specific concern in question. Concerns about market conditions are the clearest exception to the rule, with the food insecure being less concerned than the food secure. This surprising result could be explained by the relatively low market orientation of the food insecure, as they are less likely to be engaged in market activities in the first place²⁷.

²⁷ Anderson, et al. 2008. "Risks of Changing Livelihoods to Increase Market Orientation." ***how to cite?***

6. Implications

Our results provide evidence that certain attitudes and preferences, especially those relating to risk and uncertainty, vary systematically within this population. The difference is greatest between genders and between the food secure and insecure. There are also strong differences between coastal Catholic communities and inland, non-religious communities. As religion and coastal habitation are directly correlated, it is impossible to say exactly which factor is more associated with this difference in attitudes, in the absence of multivariate analytical methods.

We cannot say with certainty if changes in design or implementation features in line with the “possible program responses” would be associated with higher participation rates or more effective targeting of certain groups. This would require an experiment using these design features, evaluated against a program without them – and the limited number of relevant experiments that have been conducted suggest that the devil is in the details. But we can say, with some confidence, that important attitudinal factors vary significantly between IFAD’s target groups and other groups within the populations where the intervention is being introduced.

The key to exploiting these attitudinal differences, we believe, is to design programs that attract the target groups, rather than designing programs of interest to the population generally, and then ex-post attempting to target certain sub-populations. It is what is missing, not what is already incorporated in these interventions, that we believe can be improved upon. We contend that what needs scrutiny is the assumption that if a livelihood-improving opportunity is presented, it will be seized. We believe that such a disjuncture between IFAD’s supply and the target recipient’s demand arises because of several factors.

First, actual participation rates for training programs are much lower than the stated demand for these programs would suggest. Because a high level of demand exists, it stands to reason that efforts to catalyze program participation could be met with success. *Bridging this divide could be achieved by offering training programs in more preferred locations, or by offering programs that better match the stated interests of prospective participants.*

Second, credit programs can be tailored to better meet the needs, and address the risk attitudes, of prospective participants. Both men and women tend to prefer lower-risk group loans over individual loans with collateral requirements. Smaller, cheaper loans are also preferable, as are loans without savings requirements. There is a hierarchy to these preferences, with group loans and aversion to collateral-based loans being at the top of the list. *Designing credit programs without collateral requirements could be a means of encouraging higher rates of participation in these programs.*

Lastly, perceptions of future risks vary drastically among target populations, namely between the food secure and insecure and between men and women. Coastal Catholics are also significantly less concerned than the non-religious about weather-related uncertainties, but are more concerned about livestock disease. Program improvements may therefore require

little more than an adjustment in the relative resources and attention spent addressing these perceived risks. Our data suggest, for example, that women are more likely than men to worry about future climate change, (the same is also true for the non-religious and the food insecure). These individuals may then prefer programs which address the concern of climate change, such as training programs designed to instruct response techniques to extreme weather conditions.

Similarly, groups less concerned by climate change, such as coastal Catholic populations, may prefer programs focused more towards other concerns, such as livestock disease. Programs addressing this concern, for example, those offering credit and training for livestock health, may appeal to these individuals. In any such case, it is useful to know something about the desires and concerns underpinning the actions of prospective program participants. *By considering the subtle risk attitudes of these populations when tailoring new programs, IFAD can expect to better meet its ultimate objectives as outlined in its Country Strategic Opportunities Programmes.*

Appendix A: Sample Demographics

Table A.1. Basic Characteristics of Sample (n=1165 unless otherwise stated)

Measure	Frequency	Percent
Sample Size	1165	100
Commune		
• Thach Lac	359	31
• Tuong Son	431	37
• Thach Viet	375	32
Gender		
• Male	513	44
• Female	652	56

Table A.2. Additional demographic factors

Measure	Frequency	Percent (2)
Food Security (able to afford healthy food)		
• Yes	358	31
• No	807	69
Household Wealth Compared to Commune Average (1)		
• Below	357	31
• Average	681	59
• Above	127	11
Risk Attitude		
• Risk seeking	565	48
• Risk averse	600	52
Religion		
• Not religious	874	75
• Catholic	289	25

(1) Determined by enumerator based on commune records

(2) Percentages totaling >100 due to rounding

Appendix B: Correlations of Explanatory Factors

Table B.1 Characteristics of Food Secure and Insecure Individuals (n = 1165 unless otherwise stated)

Characteristic	Food secure (%)	Food insecure (%)
HH wealth relative to commune average***		
• Below	16	37
• Average	68	54
• Above	17	8
Religion**		
• Catholic	29	23
• Not religious	71	77
Risk attitude*		
• Risk averse	48	53
• Risk seeking	53	47
Gender		
• Male	47	43
• Female	53	57

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 61.616$ (HH Wealth), $\chi^2 = 4.887$ (Religion), $\chi^2 = 3.337$ (Risk Attitude)

Table B.2 Characteristics of the risk averse and risk seeking

Characteristic	Risk averse (%)	Risk seeking (%)
Food security*		
• Secure	28	33
• Insecure	72	67
Religion***		
• Catholic	30	19
• Not religious	70	81

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 3.337$ (Food Security), $\chi^2 = 19.959$ (Religion)

Table B.3 Characteristics of coastal Catholics and the non-religious (n=1163)

Characteristic	Catholic (%)	Not religious (%)
HH wealth relative to commune average*		
• Below	26	32
• Average	60	58
• Above	14	10

Risk attitude***		
• Risk averse	63	48
• Risk seeking	37	52
Food security**		
• Secure	36	29
• Insecure	64	71

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 4.870$ (HH Wealth), $\chi^2 = 19.959$ (Risk Attitude), $\chi^2 = 4.887$ (Food Security)

Table B.4 Characteristics of Individuals from Households of Varying Wealth

Characteristic	Below (%)	Average (%)	Above (%)
Food security***			
• Secure	16	36	47
• Insecure	84	65	53
Religion*			
• Catholic	21	26	31
• Not religious	79	74	69
Gender (among borrowing, dual-led HH's, n = 522)			
• Male	46	48	54
• Female	54	52	46
Gender			
• Male	42	44	47
• Female	58	56	53
Age** (n=1154)			
• Youth (20-30)	16	12	8
• Middle (31-45)	69	66	64
• Older (46-58)	16	21	28

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 61.616$ (Food Security), $\chi^2 = 4.870$ (Religion), $\chi^2 = 12.953$ (Age)

Table B.5 Income Characteristics of Individuals of Various Ages (n = 1154)

Characteristic	Youth (20-30) (%)	Middle (31-45) (%)	Older (46-58) (%)
HH wealth relative to commune average**			
• Below	37	31	23
• Average	57	59	62

• Above	7	10	15
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Findings are significant at *10%, ** 5%, *** 1%

$$\chi^2 = 12.953$$

Table B.6 Characteristics of Men and Women

Characteristic	Male (%)	Female (%)
HH wealth relative to commune average		
• Below	29	32
• Average	59	58
• Above	12	10
HH wealth relative to commune average (among borrowing, dual-led HH's, n = 522)		
Below	28	31
Average	60	60
Above	12	9
Food security		
• Secure	33	29
• Insecure	67	71

Table B.7 Characteristics of non-fishing Catholics and fishing Catholics (n = 289)

Characteristic	Fishing Cath. (%)	Non-fishing Cath. (%)
HH wealth relative to commune average		
• Below	26	26
• Average	69	58
• Above	6	15
Food security*		
• Secure	46	34
• Insecure	54	66
Risk attitude		
• Risk averse	56	65
• Risk seeking	44	35
Gender***		
• Male	91	36
• Female	9	64

Findings are significant at *10%, ** 5%, *** 1%

$$\chi^2 = 3.064 \text{ (Food Security)}, \chi^2 = 53.462 \text{ (Gender)}$$

Table B.8 Characteristics of non-fishing Catholics and the non-religious (n = 1109)

Characteristic	Non-fishing Cath. (%)	Not religious (%)
HH wealth relative to commune average**		
• Below	26	32
• Average	58	58
• Above	15	10
Risk attitude***		
• Risk averse	65	48
• Risk seeking	35	52
Gender**		
• Male	36	43
• Female	64	57

Findings are significant at *10%, ** 5%, *** 1%

$\chi^2 = 6.491$ (HH Wealth), $\chi^2 = 21.062$ (Risk Attitude), $\chi^2 = 4.421$ (Gender)

Appendix C: Multivariate Regression of Credit Demand

In this paper we primarily use statistical methods that categorize subpopulations of interest according to several characteristics and compare them on another margin of interest. Most of the predictors and outcomes we care about are categorical (e.g., gender, relative income, food security and religious belief), and most of our work at this stage is intended to assist the development of new models for explaining behavior. For these reasons, at this time, we primarily focus on discrete comparisons in a cross-tabulation format.

In **Table C.1** we provide the results of a probit model, predicting an individual's willingness to accept credit. This is an example only. As with all regression models, not all predictors are found to have significant explanatory power. At this stage of our analysis and understanding of the true underlying models, we believe that discrete comparison of entirely controlled subpopulation groups (defined by a few categorical characteristics) is our most valuable tool in understanding differences between segments of the population.

Table C.1: Multivariate Regression - Determinants of willingness to access credit Probit (Willing to Borrow= 1)

Dependent Variables	Model 1			Model 2			Model 3		
	df/dx	Std. Err. ²⁸	P> z	df/dx	Std. Err.	P> z	df/dx	Std. Err.	P> z
Risk Averse				-.018	.036	0.611	.002	.039	0.968
Tuong Son Catholics							-.495***	.049	0.000
Thac Lac Catholics							.560*	.243	0.072
Controls									
Age	-.007**	.003	0.012	-.006**	.003	0.012	-.005	.003	0.105
Gender (Female=1)	.298***	.035	0.000	.299***	.035	0.000	.281***	.038	0.000
Education Level (Years)	.008	.008	0.296	.008	.008	0.322	.017**	.009	0.048
Couple Household (Couple HH=1)	.171***	.055	0.005	-.239***	.042	0.000	.161***	.051	0.007
Number of Kids Under 16	.028*	.016	0.089	.028*	.016	0.089	-.015	.017	0.379
Catholic (Catholic=1)	-.239***	.042	0.000	-.239***	.042	0.000	.331	.287	0.250
Percent of Rice Consumed/Produced	-.372***	.093	0.000	-.371***	.093	0.000	-.160	.099	0.105
Tuong Son (Tuong Son=1)	.324***	.050	0.000	.323***	.050	0.000	.496***	.053	0.000
Thac Lac (Thac Lac =1)	-.136**	.052	0.012	-.135**	.052	0.012	-.575***	.042	0.000
Party Member (Communist=1)	-.093	.067	0.184	-.092	.068	0.190	-.155**	.059	0.025
Recall Ability (Out of 9)	-.015*	.009	0.097	-.015*	.009	0.095	-.018*	.010	0.064
Relative Status	.014	.011	0.212	.014	.011	0.215	.010	.012	0.397
No Savings (No Savings =1)	.002	.037	0.947	.003	.037	0.928	.055	.040	0.172
Remittances (Remittances=1)	-.076*	.041	0.065	-.077*	.041	0.065	-.043	.044	0.341
Stable Income (No Change=1)	-.062	.036	0.947	-.061*	.036	0.099	-.075*	.039	0.055
Livestock as Percent of HH Prod.	-.047	.159	0.767	-.046	.159	0.775	-.102	.170	0.548
New Economic Activity	.093**	.036	0.012	.092**	.036	0.013	.078**	.039	0.049
Percentage of land used with red book value	-.251***	.088	0.004	-.250***	.088	0.004	-.355***	.097	0.000
Log Likelihood				-512.726			-364.781		
Pseudo R ²				0.2443			0.4624		
Number of observations				995			995		

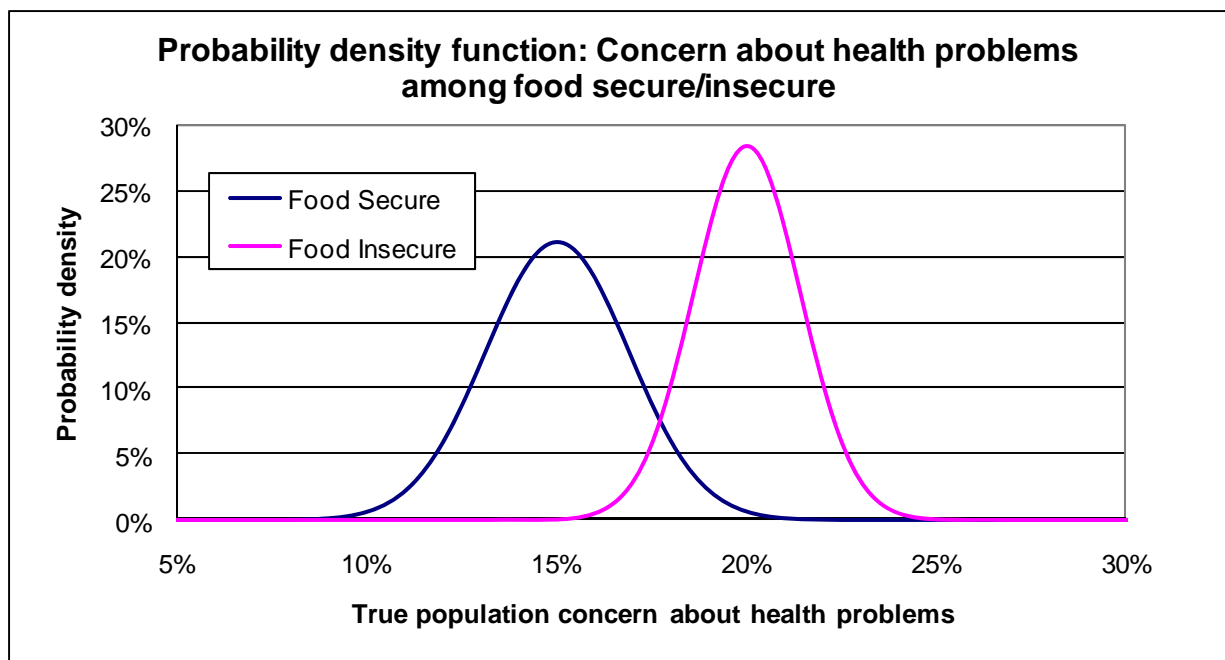
Notes: Findings are significant at * 10%, ** 5%, and 1%, respectively.²⁸ Standard error terms may be correlated because two individual respondents may come from the same household and share basic household level data given by only one individual.

Appendix D: Graphical Representation of Normally-Distributed Population Statistics

As an example, graphical representations of the predicted levels of concern among the greater population are compared for both health problems and future weather conditions. **Figure D.1** (corresponding to section 5.1 of this report) shows that the food insecure are more likely to be concerned by health problems than are the food secure. However, the overlap between these normal distributions shows that there is some chance that the true level of concern is actually the same between these two groups, or possibly higher among the food secure.

It is possible, then, that the higher level of concern among our food-insecure respondents is merely a statistical aberration within our sample. Our interpretation of this information depends entirely on the threshold by which we weigh this possibility. Throughout this report, 95% confidence is considered sufficient likelihood of a true difference among the greater population. In this case, the chance that the food insecure are not more concerned about health problems is just less than 5%, so it passes our threshold test.

Figure D.1 Concern about health problems between the food secure and insecure



The predicted level of concern about future weather conditions among the greater population between the food secure and insecure (corresponding to section 4.1 of this report) is shown below in **Figure D.2**. It is clear that the normal distributions do not overlap appreciably, and that the food insecure are significantly more likely to be concerned by this problem. In this case there is much less than a 1% chance the observed difference is a statistical aberration within our sample.

Figure D.2 Concern about bad weather between the food secure and insecure

