“Formal and Informal Credit Markets in Rural Bhutan”

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Formal and informal credit markets in rural Bhutan

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ABSTRACT

This study investigates household's credit demand, degree of loan rationing by credit sectors and households credit choice in rural Bhutan. The paper provides results from a survey of 120 households among three sub-districts of rural Bhutan. Bivariate PROBIT Model is used to estimate all three models. This paper finds evidence that a significant percent of rural population depends on both formal and informal credit as a source of credit despite huge interest rate differentials. Informal loans were mostly obtained for consumption purposes while; formal loans were mostly borrowed for long term investments. 88% of the households obtaining formal loans required collateral but collateral is rarely required in the informal sectors. Although value of land reduces likelihood being credit constrained in both formal and informal sectors, it doesn't necessarily lead to increasing households borrowing behaviours. The findings also suggest that complementary markets such as insurance markets are essential part of financial services.

Key words: credit, rationing, rural, informal, financial, Bivariate PROBIT

SUMMARY

Rural credit schemes in Bhutan formally started operating in early 1980s. However, these schemes were short-lived mainly because the highly subsidised program resulted in a mismatch of supply and demand. Later credit programs, which required rural households to make high collateral payments, limited the popularity and therefore access to formal loans. These experiences resulted in the establishment of a national agriculture development bank in 1988, the Bhutan Development Finance Corporation (BDFC) to cater to the financial needs of Bhutan's small and marginal farmers. BDFC was initially established with assistance from the Asian Development Bank (ADB). Today it has widespread outreach with branches all over twenty districts. However, despite the spread of the service, the use of formal credit facilities is not popular among Bhutanese farmers. The 2007 Planning Commission report showed that more than 80% of rural population have access to rural credit, but only 15% avail formal loans, i.e. the borrowers prefer non-formal credit sources. This happens even though the informal sector charges a high interest of 60% per year.

Although, formal and informal credit market co-exist in rural Bhutan, little is known about its effective demand, households credit choices and extend to which credit rationing occurs. This master's research aimed at studying factors determining household's choices /preferences of credit sources and degree of loan rationing by credit sectors. The study provides results from a survey of 120 households in two sub-districts of rural Bhutan, Wangude Dzongkhag and Samtse Dzongkhag respectively.

Our findings showed that 23% of the households borrow only formal bank loans, 24% borrow from only informal loans, and 25% borrow from both formal and informal sources. Also, our finding showed that a significant 28% of households do not participate in credit market at all. Further, the research suggests that access to formal credit, distance to credit source and lower interest in the formal sector are not convincing factors in influencing household preferences for credit. Many other socio-economic factors plays crucial role in determining household choice for credit market, of which key is the notion or perception of social capital, reciprocity and goodwill that is portrayed by the informal credit lenders.

A household's decision to borrow formal credit market also depends on complementary markets available to productively use the credit. In rural Bhutan, such markets are usually absent or underdeveloped. Lack of appropriate communication, disorganised enterprise network facilities and inefficient transportation systems are some problems faced by households in rural Bhutan. Therefore, simply providing rural credit without presenting productive options for credit use also limits the popularity formal credit schemes.

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LIST OF ACRONYMS AND ABBREVIATIONS

GNH	Gross National Happiness
RMA	Royal Monetary Authority of Bhutan
RGOG	Royal Government of Bhutan
BDFC	Bhutan Development Finance Corporation
RSEB	Royal Security Exchange of Bhutan
NPPF	National Pension and Provident Fund
BOB	Bank of Bhutan
BNB	Bhutan National Bank
RICB	Royal Insurance Corporation of Bhutan
TB	Tashi Bank
DPNB	Druk Punjab National Bank
BIL	Bhutan Insurance Company Limited
ADB	Asian Development Bank
FCB	Food Corporation of Bhutan

GLOSSARY OF BHUTANESE TERMS

Dzongkhag	District
Gewog	Block
Ngultrum (Nu)	Bhutanese currency

1. INTRODUCTION

With majority of world's poor living in rural areas of developing countries, it has been argued that rural development needs to be accomplished by access to credit. Provision of rural credit was primarily seen as a measure to increase agricultural productivity, adoption of new technologies and stabilize household's income. Such considerations led to many governments in developing countries intervene in rural credit, either through subsidising or nationalising their major commercial banks (Braverman and Guasch, Besley, 1994). There is now growing debate among development community that rural credit works less effectively than expected. The underdevelopment of rural credit markets has been explained by market imperfections such as; higher transaction cost, screening, monitoring and enforcement problems (Besley, 1994); and asymmetric information especially the moral hazard and adverse selection (Stiglitz and Weiss, 1981). Given the problem of market imperfection, it was argued by Boucher and Guirkinger (2007) that informal lenders have informational advantages to serve those individuals who do not have collateral and those who do not want to provide collateral. Formal institutions frequently demand collateral in order to reduce risk of default, thereby limiting the entry of small and marginal households. On the other hand, it is also the rules, regulation and lending procedures of the formal financial institutions that create the gap between farmers. Informal lenders are seen to have advantages in terms of lower transaction cost in reaching small and poor borrowers and therefore, informal will continue to remain as a complementary source of credit markets in developing countries Ghate (1992). Collateral requirements in the past were also seen as a factor determining lenders decision to ration borrowers.

Apart from the problem of asymmetric information and enforcement mechanism, researchers now acknowledge the co-existence of formal and informal sectors in developing countries. Empirical studies by Kochar (1997) and later by Pal (2002) were such studies that provided a concise view in studying credit market in rural areas of developing countries. According to their argument, the conventional literatures on rural credit assume that there is excess demand for subsidised formal credit and in turn households are rationed. However, they added that such studies failed to acknowledge that some households may not have effective demand for formal loans at particular point of time. Often, many social factors such as family ties, conveniences and flexibility, trust and relationship are considered economically significant in explaining co-existence of informal credit. Additionally, informal sectors are defined to include various segments of lenders, which are heterogeneous with respect to their lending and borrowing conditions. Hence, informal sectors may not necessarily be the last resort, but a preferred source of credit (Boucher and Guirkinger, 2007). An unique feature of informal credit sectors pointed by Turvey, Kong et al. (2010) is their lending and borrowing conditions which can occur even at

zero or negative interest rate. They concluded that the aspect of social capital, reciprocity and goodwill are important determinants of farmer's preferences for informal sectors.

As noted by Kochar (1997), we take cautionary note to first analyse, whether effective demand exists for households followed by empirical analysis of the determinants of loan rationing and finally the households choice for credit markets. Although, formal and informal credit markets co-exists in Bhutan (Hussein, 2009, Tobgay, 2003) little is known about its effective demand and extent to which credit rationing occurs. This thesis presents an empirical analysis using econometric analysis of the determinants of credit demand followed by credit rationing and households choice for credit market among 120 surveyed households in two sub-districts of rural Bhutan.

1.1 Background

Bhutan is a small landlocked country deep down in the Eastern Himalayan Mountain with a total area of 38,394 KM^2, bordering India in the south and China in the north. As of 2009 forest covers 72.2% of its total area with 42.7% under protected forest area. Bhutan therefore is recognized as global biodiversity hotspot and is among the top listed countries in conserving and protecting its environment (BAP, 2009). With only 8% of its land feasible for agriculture cultivation, Bhutan is also faced with problems of intensifying and diversifying its agriculture sectors to meet the growing food demand. Bhutan has a population of approximately 683,407[1] people with 60% living in rural areas (National Statistical Bureau, 2010). Preserving its traditional culture and environment is of high priority in order to safeguard its identity and values. In the face of globalization and modernisation, Bhutan is faced with the challenges of preserving its cultural values.

Guided by the philosophy of Gross National Happiness (GNH), individuals are placed at the centre of development policies and decision making. GNH identifies that pure economic development can be attained by: promotion of equitable and sustainable socio-economic development; conservation of natural environment; preservation and promotion of cultural values; enhancement of good governance (These are basically known as four pillars of GNH). Until the start of first Five Year Plan in 1961, the Bhutanese economy was basically small scale subsistence farming with majority of its population depending on agriculture and livestock rearing. Over the years, Bhutan has adopted a policy of cautious modernization, moving away from closed subsistence rural economy towards market oriented growth. Since then rural livelihoods have improved tremendously. About 80% of the people now have access to basic development services and facilities such as health, education, water & sanitation and agricultural services RGOB (2007). Bhutan's per capita income was recoded at USD 1825 which is one of the

[1] Figure from Census Registration, but it does not include full coverage of death and birth

highest among South Asian countries. In terms of sector wise contribution, tertiary sectors were the main contributor followed by secondary sectors and primary sectors (RMA, 2010)

Agriculture is the single largest sector providing livelihood to 66.6% of the population. Although agriculture as a share of total GDP has declined from 24.7% in 2004 to 18.5% in 2008, it remained as the predominant source of income to much of the rural population (National Statistical Bureau, 2010). Rural income is therefore directly linked with the level of agricultural productivity, access to complementary markets (such as communication, education and health facilities) and social and economic services (such as rural credit and insurance facilities). The Royal government of Bhutan has taken measures to enhance agricultural productivity by promoting varieties of high-yielding seeds, distributing fertilizers and machineries and promoting infrastructural facilities. Among these measures, the need for increasing the outreach of financial services by providing access to credit facilities was one of the important measures undertaken by the Government of Bhutan.

1.2 Financial Institutions in Bhutan

With the establishment of the Royal Monetary Authority of Bhutan (RMA) in 1982, financial sectors in Bhutan underwent a remarkable change in terms of providing more and better efficient financial services. The RMA is the central bank of Bhutan responsible for issuing currency and implementing monetary policy. Under its regulation, there are five commercial banks and two non-bank financial institutions providing financial services. In addition, the Royal Security Exchange of Bhutan (RSEB) and National Pension and Provident Fund (NPPF) are important components of Bhutanese financial institutions (Rahut et al., 2010). RSEB is responsible for providing information on capital markets to ensure regulation of market integrity and investor confidence. While, NPPF provides long term solution in sustaining pension scheme by providing loans and at the same time developing new strategies to ensure adequate retirement benefits.

In 2009, the real GDP growth rate was estimated 6.7% compared to 4.7% in 2008 and it is expected to remain stronger with continuing growth in hydropower and industrial sectors (RMA, 2010). The total balance sheet size of the financial institutions is Ngultrum[2] (Nu.) 69.55 billion in June 2011, compared to Nu. 55.29 billion in 2010. Rahut, Velásquez Castellanos et al. (2010) analysed performance of financial institutions in Bhutan from the period 1999-2008 using Data Envelopment Analysis (DEA). Their findings suggest that Bhutanese financial sectors have witnessed an increase in return to investment and capital deposits in their study period.

The Bank of Bhutan (BOB) was the first commercial bank in Bhutan. It was established in 1986 in collaboration with the State Bank of India. Today, BOB is the biggest (and oldest) commercial

[2] 1 Euro =60 Ngultrum

bank in Bhutan with its branches all over the country. To meet the growing demand of credit services, the Bhutan National Bank (BNB) formally operating as unit trust of Bhutan became the second largest commercial bank in 1997. The Bhutan Development Finance Corporation (BDFC) was establishment in 1988, to look after the administration of rural financial assistance. In the non-bank financial sector, Royal Insurance Corporation of Bhutan (RICB) was established in 1975 under the charter of His Majesty the fourth king primarily to meet the insurance needs of its people. In addition, RMA approved licences in 2010 for two private banks (Tashi Bank Limited and Druk Punjab National Bank) and one insurance company (Bhutan Insurance Company), to meet the growing needs of financial services and to enhance competition and diversify the outreach of credit and insurance services,.

Although financial sectors recorded a growth of 6.2% in 2009, their share to national GDP declined marginally from 8.4% in 2008 to 8.1% in 2009 (RMA, 2010). Contribution of private sectors to economic growth was limited due to inadequate legal framework for private sector activities and inefficient government control over the financial system. Removal of administrative controls on interest rates did not bring much changes in real interest rate levels (ADB, 2010). The Non-Payment Loan (NPL) or rate of default for banks (BDFC, BNB, BOB, TB, PNB) and non-banks (RICB, NPPF, BIL) remains highly volatile due to limited institutional capacity and limited access by small enterprises. It resulted in high liability and low profitability. Distribution of credit system remained biased towards urban areas. The figure below shows the sectorial credit distribution as of June 2011.

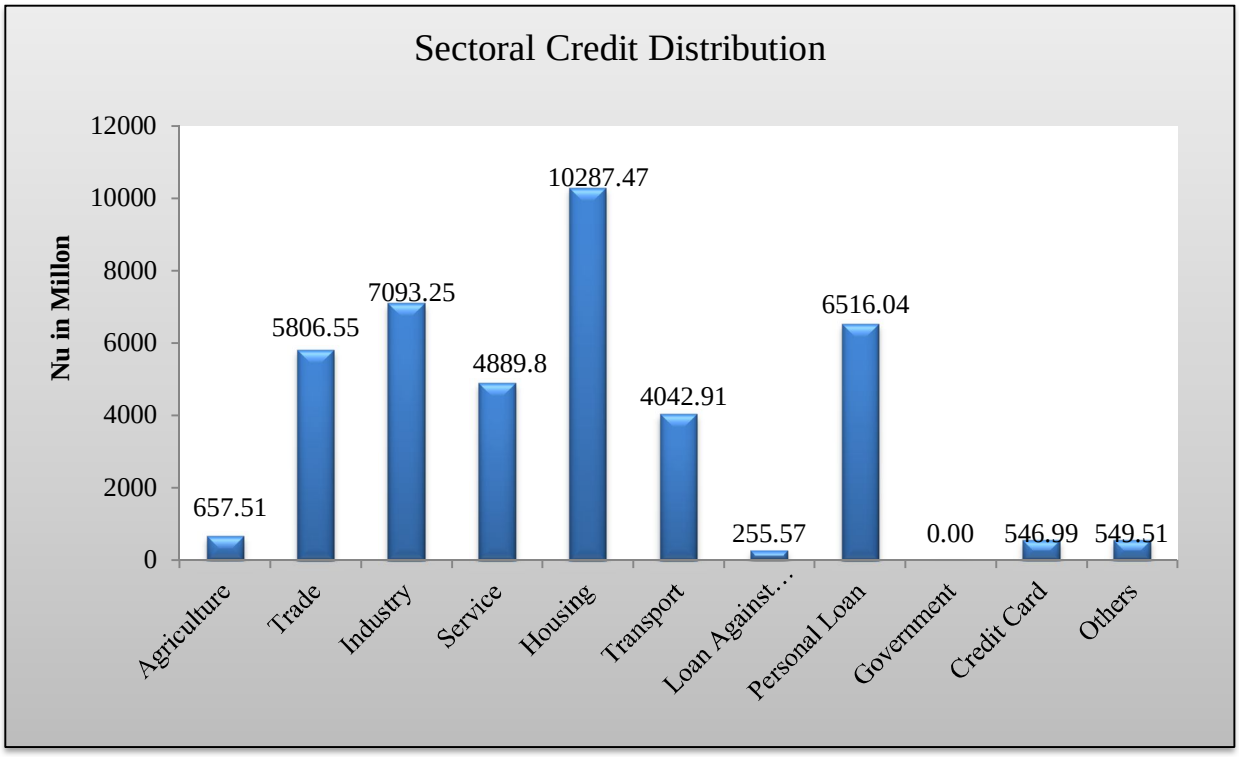

Figure 1 (Source: RMA, 2011)

The increase in credit portfolio mainly resulted from an increase in demand for housing and industrial loans followed by personal loans and trade (RMA 2011). Agriculture sector loan account only 1.62% (Nu. 657.51 million) out-of the total financial sector portfolio. Access to long-term credit for Small Scale Entrepreneur (SSE) and rural people is still limited due to high interest rates, short loan amortization period and excessive collateral requirements (ADB, 2010).

Rural credit schemes in Bhutan operated formally in the early 1980s. However, these schemes were short-lived mainly because rural credit was highly subsidised and therefore resulted in a mismatch of supply and demand. Later programs, which required rural households to make high collateral payments as required by operating financial institutions limited the popularity and therefore access to formal loans and credit. For example, loans were borrowed at commercial interest rate of 14% from the banks and were re-lend in rural areas at subsidized interest rate of 10% (Tashi and Dorji, 2002). These experiences resulted in the establishment of a national agriculture development bank, Bhutan Development Finance Corporation (BDFC) in 1988 to cater to the financial needs of Bhutan's small and marginal farmers with especial focus on the agricultural sector (BDFC, 2010). Today BDFC has wide rural financial outreach with branches all over the 20 districts. BDFC provides banking service at community level whereby an officer from BDFC meets the farmers at least once a month for loan approval, disbursement and documentation. Farmers can also register their name with the community office if they want to avail loans.

Rural credit under the scheme of BDFCL can be categorised under three tiers depending on the amount of loan and collateral/guarantee requirements: (1) Group Guarantee Lending & Saving Scheme (GGLS), Small Individual Loan Scheme (SILS) and Commercial Agriculture & Industrial Loan Scheme (CAILS). GGLS loans are basically designed for small and marginal farmers. GGLS loan does not require any form of collateral or securities but group members need to co-guarantee each other. GGLS is similar to microfinance. The maximum loan size under GGLS is Nu. 100,000 (1667 Euros). Mobile Banking Services (MBS) is another scheme provided by BDFC. MBS aims to provide loans and other banking related services at grass root level.

1.3 Problem Statement and Justification

The difficulties with the extension of rural credit in Bhutan as pointed by Tashi and Dorji (2002) are high cost of administration, low rate of recovery, low population density, lack of adequate infrastructure, lack of financial market and low literacy rate. Given Bhutan's topography and scattered settlement, transaction costs are often high, which is then compensated by charging high rate of interest on the loans. Rural credit programs in the past have failed to bring substantial impact. Hussein (2009) cites two examples of such failure: (1) Bank of Bhutan Limited (BOBL) which was mandated to give 20% of its loan portfolio as rural credit did not even disperse 1%. (2) Food Corporation of Bhutan (FCB) which assumed the responsibility of disbursing rural credit had to short lift its scheme after only two years of implementation. Given the topography of the country and inefficient transport infrastructure, it is extremely difficult and costly for the financial sectors to set up their branches. The use of credit facilities is not popular among Bhutanese farmers resulting in low returns and profitability of the financial institutions. Further, credit system in Bhutan is characterised by heavy use of cash and paper base instruments for most financial transaction due to lack of proper credit facilities, thereby adding to the cost of financial institutions. Currently, under the scheme of BDFCL, credit distribution is biased. Despite the fact that poverty rates are much higher in central and eastern part of the country, poor regions of the eastern and central region received only 25-35 percent of loan disbursement, while the well-off western region receives 42 percent (Gyeltshen, 2011).

Borrowing from formal credit in rural Bhutan is not substantial due to inadequate market facilities. Planning Commission report (2007) revealed that more than 80% of population have access[3] to rural credit, but only 15% avail loans from formal financial institutions. Total loans and advances of the financial sectors have increased by 25% in 2009 to 2010. However, agricultural sector witnessed a minimal increase with only 1.57% (RMA, 2010). There are various credit transactions carried out among friends, family, shopkeepers, landlords in rural areas of Bhutan and people still continue the old system of trading in kind or borrowing within community and friends (Hussein, 2009). Similar studies done by Gupta and Chaudhuri (1997) reveals that borrowing from friends and relatives is common especially in the developing countries because of the uncertainty and fluctuations in agricultural output.

In the informal credit market, private moneylender charge 25% interest per annum financing mostly short-term and consumption loans Tobgay (2003). According to Siewertsen, (2002) monastic bodies which have substantial revenue also practice the role of informal money lending to farmers in rural areas of Bhutan. BDFC (2010) revealed that, with rapid extension of rural credit, reliance on private moneylenders has declined over the years. However, lack of

[3] Access is defined as the availability of formal financial institutions within the community

evidence in absence of proper survey and panel data point remains a major limitation. This research is to study factors determining household's participation in credit market and their choice/preferences of source between formal and informal financial institutions.

1.4 Objectives

The research was aimed at studying factors determining household's participation in credit market and their choice/preferences of source of credit. In the process of studying household's preferences for credit market, we also looked at factor determining demand for credit and loan rationing by credit sectors. Therefore, our main research question (MRQ) consists of three parts. For each MRQ, subsequent research questions (SRQ) were formulated.

1.5 Research questions

MRQ.1 Do the farmers want credit? (Demand for credit)

SRQ 1.1 What is the purposes of availing loans?

SRQ 1.2 What are the socio-economic characteristics that determines demand for credit?

MRQ.2 what are determinants of being credit constrained? (Loan rationing)

SRQ 2.1 Can households get the amount of loan requested?

SRQ 2.2 Did any of the sectors refused to lend loans?

SRQ 2.3 What are the socio-economic characteristics that determines loan rationing?

MRQ.3 which source do farmers prefer to borrow from and why?

SRQ 3.1 What are different sources of credit available for the farmers?

SRQ 3.2 What is the past borrowing experiences from these sectors?

SRQ 3.3 What are different characteristic of loan? (Interest rate, collateral requirements, loan size and application fee)

SRQ 3.4 What are costs involved in borrowing loans? (Expenses incurred, number of visits and distance to credit source)

SRQ 3.5 What are the socio-economic characters that determines participation in credit market?

1.6 Outline of the thesis

This thesis is divided into six chapters. Following this introduction in chapter 1, subsequent chapters presents the theoretical framework, research methodology, descriptive statistics, results & discussion and conclusion & recommendations. Figure below (figure 2) shows the outline of thesis.

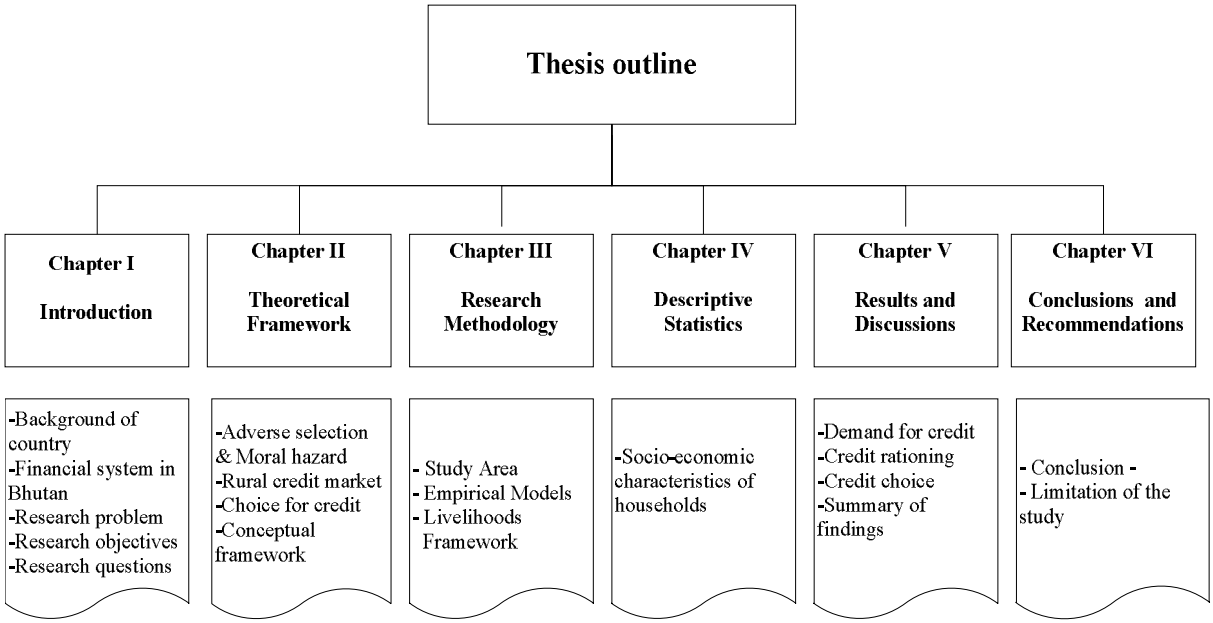

Figure 2

2. THEORETICAL FRAMEWORK

The definition of credit has been given by number of economists, professionals and accountants. Credit is defined as "a legal contract between the lender and the borrower, where the latter receives resources or wealth with a promise to repay in future". Credit refers to terms and conditions associated with deferred payment arrangement. According to Schumpeter (1934) "credit is essentially the creation of purchasing power for the purpose of transferring it to the entrepreneurs". Access to credit narrows down the gap between production and consumption (Schumpeter and Backhaus, 2003).

Promoting rural credit by providing access to financial services was primarily seen as a tool to increase agricultural output and productivity, adoption of new technologies, stabilizing household's income, improving farm's inputs such as fertilizer, increasing rural employment and reducing poverty. According to Braverman and Guasch (n.d) , rural credit aims at reaching many objectives which are sometimes conflicting. Rural credit institutions can be broadly categorized into formal or institutional and informal or non-institutional. Formal sector is regulated either by central bank or the government. This sector includes commercial banks, credit cooperatives, agriculture banks and insurance companies. Informal sector is not regulated and the lending conditions are often flexible. This sector includes local moneylenders, landlords, traders, friends and relatives. Other type of rural credit includes, semi-formal institutions consisting of non-governmental and international organisations. According to Ghate (1992), the scale of operation is much larger for the formal sector and they are often subject to variety of regulations relating to capital, reserves, liquidity and interest rate.

The problem with the formal sector is lack of personal knowledge about their borrowers. This leads formal lenders to frequently insist on collateral and interest rate in-order to reduce the risk of default. Such assets (collateral) are often absent or insufficient for poor borrowers in rural areas of developing countries partly because of poorly developed property rights (Besley, 1994). For the informal sector, collateral requirement is not a problem. Informal sectors will be willing to accept collateral in the form of standing crops or small quantity of land or in form of labour. This kind of flexibility in the informal sectors can solve the problem of information constraint and informal lenders are often considered in "doing much better job" Ray (1998).

According to Besley (1994) credit like any other good have a demand and supply. Like the price of goods, rate of interest charged becomes its price. In idealised market, equilibrium interest rate is determined through demand and supply and the market gets cleared, both the borrower and lender are equally betteroff. But credit market diverge from idealized market due to lack of information about borrowers. Banks may therefore use interest rate as screening device to offset losses of default, but simply raising interest rate may attract the risky borrowers. Often, interest rates charged is seen to have dual role in sorting potential borrowers (adverse selection) and

affecting the quality of borrowers (moral hazard) (Stiglitz and Weiss, 1981). The problem of moral hazard and adverse selection are usually common in credit market. Interest rate do not necessarily clear the market, but may affect the nature of transaction. The problem becomes more severe when credit is subsidised or regulated. When interest rate is not determined via market forces, tendency to generate excessive demand is higher. This can lead to financial downturn or financial misallocation in an economy. A brief discussion on adverse selection and moral hazard in relation to credit market is present in the subsequent section.

2.1 Adverse selection & Moral hazard

Adverse selection arises when buyers and sellers have asymmetric information. As pointed by Besley(1994), adverse selection results when lenders are uncertain about their borrowers. In the presence of imperfect information, interest rate and collateral requirements serves as an instrument to screen bad borrowers. But, if interest rate is adjusted to off-set the losses of default, it will attract the risky borrowers. Asymmetric information about the borrowers therefore, punishes good borrowers and subsidizes bad borrowers. This results in misallocation of capital and resources in the economy (Murgai et al., 2002). Lack of information about the lenders can result in too little investment in an economy, when lender decides to lend small amount of loans to identify bad borrowers. Therefore, in the absence of information, lenders may not choose to serve some individuals.

The problem of adverse selection is more common in the formal credit market because banks will not have so much information about their borrowers. Sorting out risky borrowers is not only difficult, but also impossible (Besley, 1994). Informal lenders can to some extent solve the problem of asymmetric information because of their personal relationship, social ties and often being in the same community (Bose, 1998). In this case, informal lender are said to have more information about their borrowers.

Moral hazard arises when individual do not take full responsibility of his/her action. In credit market, simply increasing rate of interest would change the behavior of borrowers inducing them to undertake risky business (Stiglitz and Weiss, 1981). Higher interest rate will negatively affect the behavior of borrowers because risky projects become more attractive at higher interest. Typically, lender would expect the borrower to choose the action/projects where marginal cost equals marginal benefit. But this will not necessarily be the case when borrowers and lenders share the same risk. As a result, the tendency for borrowers to take risky business increases consequently reducing the probability of repaying the loans.

According to Besley (1994), moral hazard can lead to externalities. For example, if an individual is insured, default is transferred from insurer to the lender and there will be no incentive for borrowers to repay the loan. Besley also mentioned that moral hazard in itself may not be

argued for government intervention in credit market, but their combinations with other factors are likely to be inefficient. Program such as credit delivery system can solve the problem of moral hazard by tying credit and saving together (Mohiuddin, 1993). This type of build-in mechanism can also help to overcome unforeseen circumstances.

2.2 Rural credit market (intervention, problems and issues)

Besley (1994), has shown the reasons of intervention in rural credit market in developing countries in the presence of market failure. He described credit market as diverging from idealized market due to the problem of enforcement and presence of imperfect information. Markets in developing countries are characterized by low collateral (lack for secure payments for loans), missing complementary markets (commonly communication and insurance markets), covariant or common shocks, segmentation of market (market imperfection) and imperfect information about borrowers. These problems provided a new theoretical foundation for policy intervention in rural credit markets. Other reasons justifying government intervention are to: control monopoly power (through direct regulation on interest rates) and protecting depositors (insure that depositors do not withdraw at once).

Empirical evidence shows that interest rates in the informal sector are very high. For example interest rates charged by the informal money lenders were 5-10 percent per month in Thailand (Siamwalla et al., 1990). Similarly, Aryeetey et al. (1997) in their studies found that moneylenders in African countries charge interest rates ranging from 10% in Tanzania to 48% per year in Malawi. Therefore, it was hoped by the government that intervening in rural credit market by providing cheap/subsidized credit will lower the reliance of farmers on the moneylenders and provide beneficial financial services (Bose, 1998). Hence, promoting rural credit by providing access to financial services was primarily seen as one of the measures to stabilize income and consumption or to alleviate chronic and transitory food security (Zeller, 1997). Rural credit as a tool to improve livelihoods of the poor in developing countries has gained momentous attention of many multilateral and bilateral aid agencies (Thomas, 1995). Since then policy intervention in rural credit of many developing countries was to provide cheap and subsidized credit in-order to increase agriculture productivity and improving rural income (Hoff and Stiglitz, 1990). According to Besley (1994), government of India and Mexico nationalized their major banks in-order to set up branches to facilitate lending. Similarly, in Philippines banks are mandated to disperse 25% of their portfolio to the agriculture sectors. So it seemed that credit markets in rural areas of developing countries are subject to many regulations and interventions.

However, government interventions in rural credit markets failed to increase agricultural output or stabilize rural income or reduce dependence on informal lenders. For example, between

1951-1971, the supply-lead approach adopted by government of India to increase agriculture credit resulted in concentration of credit in the hands of large farmers with majority of small farmers having little or no access (Binswanger et al., 1992). Many studies carried out across the world revealed that policy decision to provide cheap/subsidized credit facilities was inefficient and did not bring much improvement. Siamwalla et al. (1990) has found that during late 1960s and beginning of 1970s intervention by government of Thailand in agriculture credit did not achieve its objective of providing low-cost funds. Similarly, direct lending approach by the government of Ghana, Malawi, Nigeria and Tanzania resulted in financial mismanagement and poor loan portfolio performance (Aryeetey et al., 1997). Government policies/ interventions in rural credit by subsidizing rural credit in many developing countries failed to achieve their objectives. In Bangladesh, subsidized rural credit was favoring the richer society with lower loan repayment rates and loans were often used for political power (Ray, 1998).

Many authors have tried to explain the cause of failure of government interventions in rural credit market. For instance, Gupta and Chaudhuri (1997) pointed out that when formal and informal credit is complementary, subsidized credit will not result in reducing interest rates of the informal sectors. Luis (1986) argued that providing credit facilities at low interest rate distorts the real price ratio of investment opportunities by undervaluing the real cost of capital.

On the other hand, the concept of informal credit is broad. Aryeetey et al. (1997) defines informal finance as any or all non-market institutions such as credit cooperatives, moneylenders, friends, relatives etc. that do not rely on formal contractual obligations enforced through a codified legal system. Turvey et al. (2010), in his study 'borrowing among friends in rural China' found that borrowing and lending between friends and relatives occur at zero or even negative interest rate. They have shown that strong relationship between friends and relatives can even wipe off formal credit institutions. Udry (1990) in his study among 198 households in Northern Nigeria also found that most informal loans are transacted within village or kinship groups which makes information asymmetries less important. So, he argued that informal credit market plays greater role in the reaching the small and marginal farmers where the formal sector fails to do so. Similarly, Barslund and Tarp (2008) in their study among 932 households in four provinces of rural Vietnam found that informal lender especially the transaction between private lenders and friends account for 36% of all loans. He also found that collateral is used for 70% of all formal loans whereas collateral is rarely needed in the informal sectors. Ernest and William (1997 and others) in their study of informal credit market in developing countries came with the conclusion that a government policy to promote cheap credit is a necessity but not a sufficient condition for rural development. They also concluded that financial development strategies should recognize the importance of both informal and semi-informal financial institutions in reaching diverse segment of the population.

Armendáriz (2010), SimilarlyEllis (1992), Siamwalla et al. (1990) and Ernest and William (1997) attributed the failure of formal credit market to compete with informal market on the following reasons:

- Imperfect information- Lack of proper information about the lender increase the cost for formal sector, while on the other hand informal lenders can easily obtain information via personal and social relationship. Sometimes information is not even required when loan transactions is between friend and families.
- Collateral/securities- Informal moneylenders are more flexible in terms of securities than formal sectors. An informal sector accepts labor, standing corps, livestock's, and jewelries, as collateral/securities which formal lender cannot. Therefore, Households in developing countries are not considered credit-worthy due to lack of collateral by the formal sector. On the other hand collateral in the form of labor, livestock have less risk for the borrower. Hence, households may prefer informal credit than formal credit.
- Low interest rate- Subsidized interest rate will cause excess demand for credit resulting in credit rationing and favoring only the big and rich borrowers. Further, savings is discouraged when interest rate is low.
- Transaction cost- includes the cost of screening, monitoring and contract enforcement. Due to large number of small borrowers transaction cost are usually high for the formal banking sectors. On the other hand transactions cost in the informal sector can be reduced by linking credit through the overlapping personae of moneylender, product dealer, landlord or employer.

Given these factors, developing country's credit system can therefore be seen by large reliance on informal credit market. So simply assuming that subsidized credit can reduce reliance on informal sector is an idealistic notion of policy makers.

2.3 Choice for credit (Informal & Formal)

Rational theory assumes that "individuals make choice that provides them with the greatest benefit or satisfaction and that are in their highest self-interest". However, this assumption is often not realistic. In an economy of imperfect information and incomplete market household's choice to participate in credit market depends on various socio-economic factors. These factors including lending terms and conditions, education level, size of family, labor, assets, etc. Various studies have been put forward to analyze these factors in determining household's participation in credit market.

Pal (2002), studied household's sectorial choice for rural credit in India using a multinomial probit model. He categorized household sectorial choice into four groups depending on their effective demand for loan (no loans, only informal loans, only formal loans, both formal and informal loans). He found that having higher value of land and frequency of loan overdue increases the likelihood of borrowing only from the formal sector but value of land was not found to have significant effect for households borrowing informal loan. While, requiring consumption loan, and possibility of loan at zero interest increase the likelihood of borrowing from the informal sector. Having wage employment reduce the probability of borrowing both from formal and informal sector. Similar, Zeller (1994) studies factors determining participation in credit market in Madagascar separately for formal and informal sector. He analyzed household's choices for credit using demand and supply function. He found that on the demand side household probability to participate in credit market depends positively on age, education, sick days, education level, bad harvest, marriage and circumcision. Boucher and Guirkinger (2007) used data from farm-household surveys in Latin America to develop a model on the role of informal credit market. 60-90 percent formal sector loans required collateral as a screening device to ration loans. Their result suggests that comparison of collateral requirement between formal and informal sector is a major reason for households choosing informal sector. They suggested, credit supply to overcome constraints have limited impact on household's participation in the formal sector.

Household's decision to participate in credit market also depends positively on complementary markets such as insurance market. When insurance market are underdeveloped, household's smooth their income shocks through informal credit arrangements (Udry, 1994). Rural credit markets in developing countries lack many feature/complementary market. Underdeveloped communication facilities, inefficient transportation system, lack of insurance scheme are few examples of missing markets in developing countries. Therefore, choice for credit also depends on absence or presence of such complementary markets.

The informal credit sector is highly heterogeneous with respect to type of relationship between the borrower and lender, primarily because of lender type, regionality and diverse lending

activities. Farmers may choose informal sectors for reasons other than credit rationing and collateral requirement in order to avoid harassment and burdensome procedures (Ayyagari et al., 2008). They test the hypothesis that entrepreneurs will opt-out formal finance if it operates in a predatory regulatory environment. Their result suggested that entrepreneurs are most likely to rely on informal credit sources when formal credit operates under regulatory environment.

Household's income in rural area is subject to wide fluctuations such as environmental shock, business shocks, disease and death of people and livestock, weather shocks and policy shocks. Under such circumstances, formal credit may not be available or it is easier to borrow from informal sectors. So choice for credit not only depends on availability of formal credit, but other social factors such as conveniences and flexibility. The aspect of social capital, reciprocity, goodwill and understanding can therefore be considered economically significant in households' decision to borrow from informal credit. On the other hand, the informal sectors operate locally, using local information and enforcement mechanism. They are considered in having potential to serve diverse segmented groups.

2.4 Conceptual framework

In this section the main concepts are elaborated which are used in the study to understand the interaction between formal and informal credit markets in rural Bhutan. The following methodology chart (figure 3) gives an overview of studying household credit choice:

- Firstly, individual demand for credit is analyzed. Since choice for credit sources is primarily a function of demand for credit, we will therefore empirically examine factors determining demand for credit.

- Secondly, availability of credit sources will determine credit preferences of borrowers. Different type of credit sources available for households needs to be identified. Broadly, sources of credit will be categorized into formal and informal credit institutions.

- Thirdly, from the available credit sources, whether an individual household can get loans (loan rationing) will be studied. Availability of credit source may not be a sufficient condition to determine household's preference for credit. But, given the demand and available credit source, whether households could get loans will jointly determine households' preferences for credit.

- Finally, the choice for credit is analyzed taking into account the demand for credit, loan rationing, lending criteria, cost of borrowing, use of credit sources and socio-economic characteristics of households.

Conceptual Framework

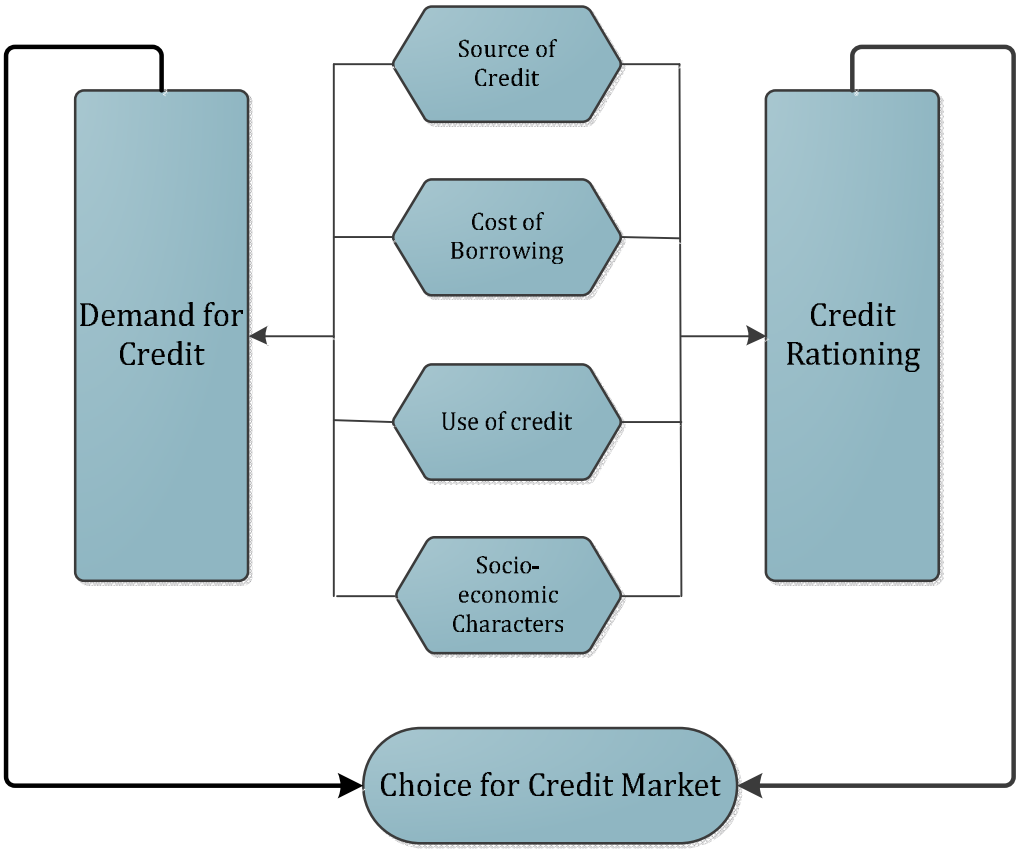

Figure 3

3. RESEARCH METHODOLOGY

This research was based on the primary data collected from individual farmers receiving credit both from formal and informal institutions as well as those who do not. Formal sectors considered in this study are commercial banks, non-bank financial institutions, Non-Government Organisations (NGOs) and development financial institutions, in particular Bhutan Development Finance Corporation (BDFC). Similarly, informal sectors included are local moneylenders, friends & relatives, landlords, traders, shopkeeper and government employees.

The survey was carried out on 20th July to 31st September 2011 in two district of Bhutan: Wangdue Phodrang Dzongkhag[4] and Samtse Dzongkhag respectively. As part of research ethics, proper approval from the concerned district head was availed to conduct household interviews (See appendix II). The research design also included interviews with expert consultancies of financial institutions on rural loan portfolios and difficulties faced with extension of rural credit in Bhutan. Secondary data from government agencies and non-government organisations were also obtained through accessing their archives. Household, a platform where social and economic interdependencies largely occur is taken as the research unit (Ellis, 2000). A total of 120 households were successfully interviewed with 60 households from Gangtay & Phobji Gewog[5] under Wangdue Phodrang Dzongkhag and another 60 households from Sipsu Gewog under Samtse Dzongkhag. The selection of sample is based on Stratified Random Sampling (SRS).

Since there was no proper record maintained with the Gewog office on number of households, listing of individual households was not possible. The records were either not updated or missing for some households. Often, two to three households were registered under one family head and for some households the head was either a deceased or living away from the village. Further in some cases, randomly selected farmers refused to participate in the survey. This may cause sample selection problem if willingness to participate in the survey is correlated with likelihood of participation in credit markets. However, measures have been taken by selecting every third household in case of missing observations or non participatory households along the same direction (settlement pattern) to avoid sample selection bias. Another problem encountered with this survey was villagers coming to see while respondents were being interviewed. This is seen to influence respondents view especially on questions such as; reason for not getting loan or use of loan facilities and type of collateral requirement. It was impolite to ask viewers to leave when the interview was conducted. Such problems were encountered in five households. To this end regression result was established to check their influence using dummy variables. Such variable are however not seen to have significant influence on our model

[4] Dzongkhag: District
[5] Gewog: Sub District

estimations (see appendix I). Since the research coincided with busy potato harvesting season especially in Phobji and Gangtay Gewogs, it was quite challenging to gather all required information in the limited given time.

Both open-ended and closed-ended questionnaires were used to collect the data. The selected sample composed of villagers, local moneylenders, shopkeepers and landlords. The rationale behind selecting rural households was because of their low borrowing behaviour from the financial institutions (RGoB, 2007). Respondents were also asked to identify informal credit source and rate of interest charged. This is to help distinguish between commercial and non-commercial lenders. Local moneylenders were interviewed with open-ended questionnaires to see how they cope up with the problem of information asymmetric and enforcements mechanism. Though, moneylenders were bit sceptical about the questionnaires, but it seemed that they have strong ability and commitment towards their regular borrowers.

The construction of questionnaires was based on "Living Standards Measurement Studies" volume II & III designed by the World Bank with slight changes to meet our objectives.

3.1 Study Area

Figure below is the map of Bhutan and its region where the samples were selected. Wangdue and Samtse Dzongkhags differ in terms of climatic conditions, landscape, religion and culture to some extent. In following section, a brief discussion of the each study areas is presented.

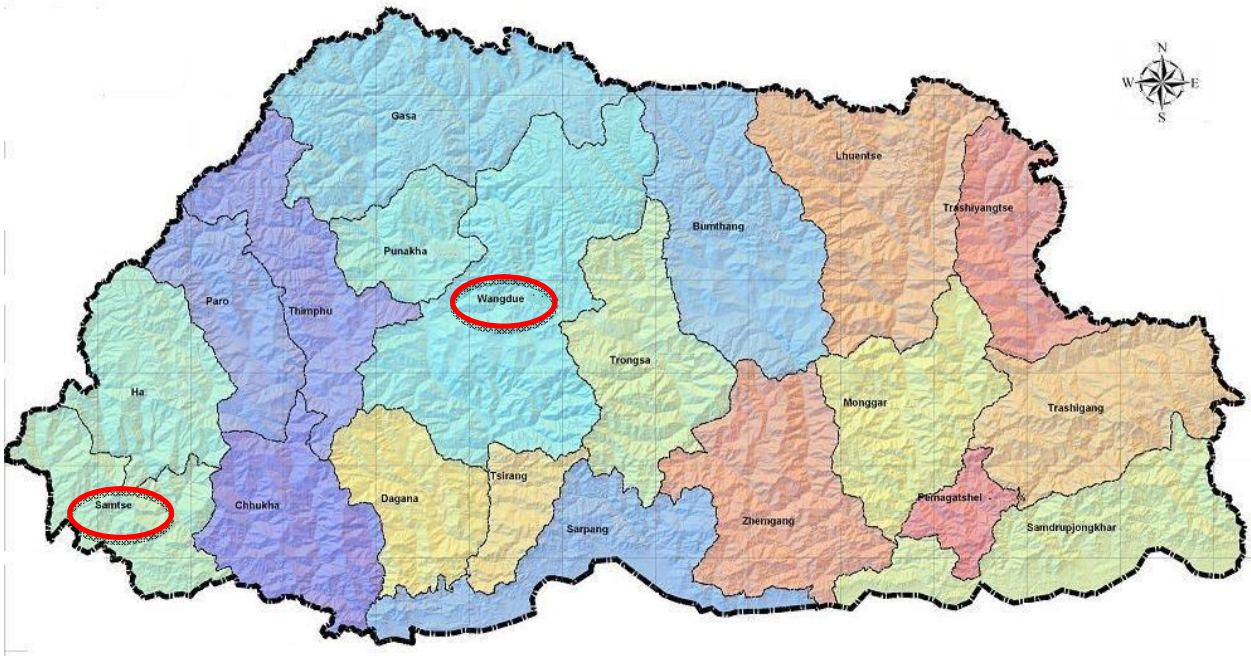

Figure 4. Map of Bhutan

Wangdue Phoderang Dzongkhag

Wangduephodrang Dzongkhag is located in west-central part of the country. It is the second largest Dzongkhag in Bhutan consisting of 15 Gewogs. 70.28% of total land in the Dzongkhag is covered under forest and has the largest flora and fauna in the country. The Dzongkhag has an area of 4029.3 Sq. km with an elevation ranging from 800 to 5800 meters above sea level. Being centrally located, it has relatively easy access to major markets. The Dzongkhag has over 60% of its registered private land suitable for cultivation of crops with rich pasture land, adequate water, and favourable climatic conditions. Most of the Gewogs are well connected by farm roads, feeder roads and power tiller tracks, making the Dzongkhag conducive to farm mechanization.

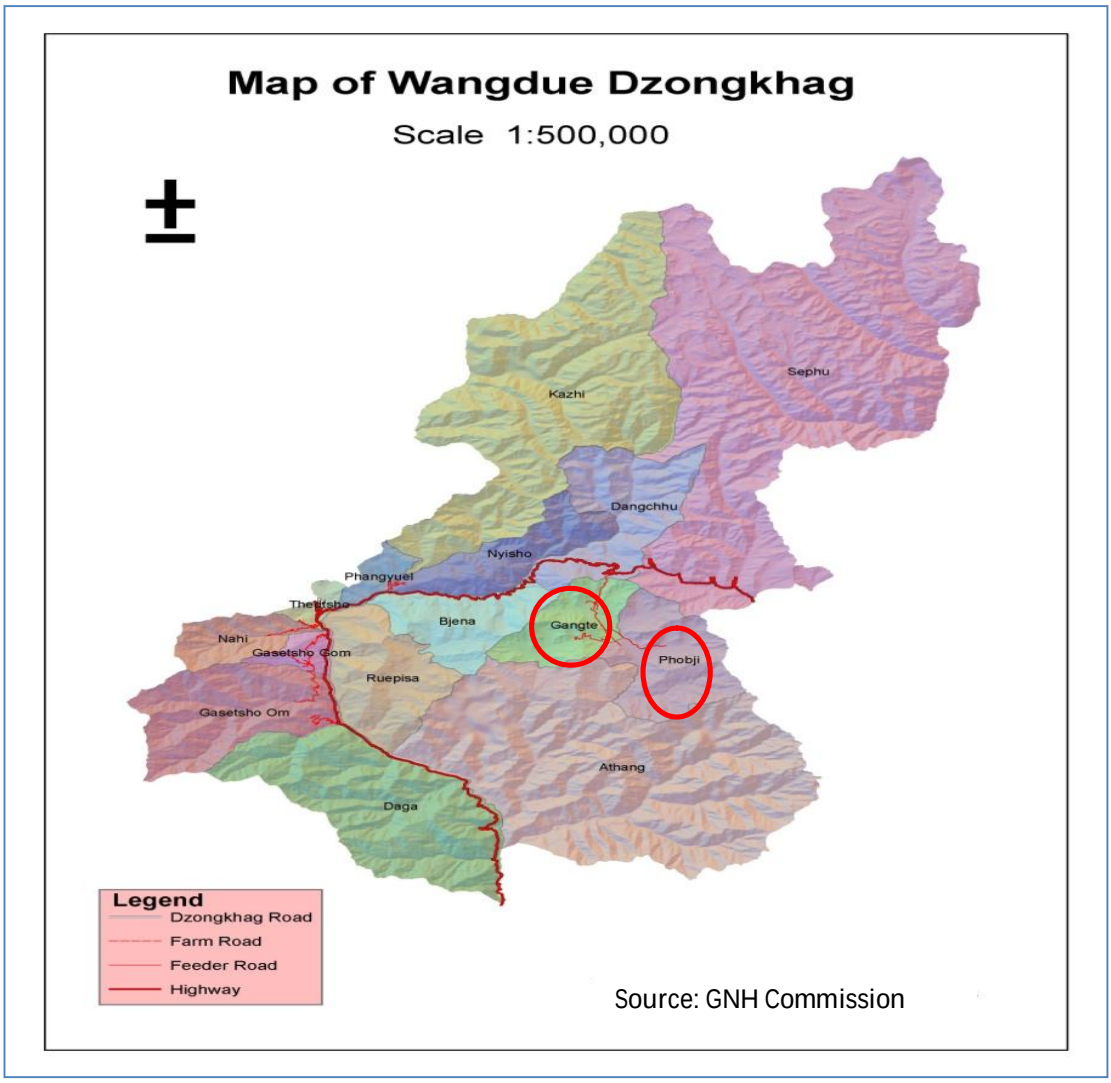

Figure 5. Map of Wangdue Dzongkhag

The main crops found in Gangtay and Phobji Gewogs are wheat, buckwheat, barley and potatoes. Potato is the main cash crop and a source of income generating activity in this region. Livestock products such as butter and cheese are also produced on a semi commercial scale. Although, the Dzongkhag has abundant opportunities and strengths for socio-economic development, the low

literacy rates and the lack of capital for rural enterprises have inhibited the development of the Dzongkhag. The extensive destruction of crops by wild animals and small landholdings which are widely fragmented discourages farmers from initiating large -scale farming (GNH, 2008b).

Phobji Gewog has the most significant and biggest wetland of Bhutan (Phuentsho, 2010). Phobji Gewog is particularly known for most endangered bird called Black-necked Crane which migrates from Tibetan Plateaus in the winter. Therefore, it is also considered a popular tourist spot in the winter.

In the formal credit, BDFC, BOB, BNBL, PNB are well established in Wangdue Phodrang Dzongkhag. Banking service of BDFC is provided at community level whereby an officer from BDFC meets the farmers at least once a month for loan approval, disbursement and documentation. Group Guarantee Lending & Saving Scheme (GGLS) is also popular among households in Wangdue Phodrang region. According to Tobgay (2003), 27.8% of the people in Phobji Gewog borrowed exclusively from local moneylenders at 20-25% rate of interest per annum with only 2.6% of population borrowing from formal financial institutions. In the context of mutual insurance, we also find evidence from Zizi villages on how informal credit plays role in pooling risk among village community. Every year, each household contributes Nu. 100 to the local monastery, which is indeed managed by the villagers. The accumulated fund is then disbursed at 10% interest per annum within villager's who are in need of money.

Samtse Dzongkhag

Samtse Dzongkhag is situated in the south-western part of the country. The Dzongkhag has total geographical area of approximately 1309.1 sq. km with elevations ranging from 600 to 3600 meters above sea-level. About 64% of the total land area is under forest cover with only 8% for farm cultivation (GNH, 2008a). Samtse lies in the sub-tropical climatic zone and experiences warm and humid winter and hot and rainy summer with an average annual rainfall of 1500 to 4000 ml. Samtse Dzongkhag is bordered by states of India namely West Bengal and Sikkim in the south and west respectively. According to (GNH, 2008a), Samtse Dzongkhag has the potential to serve as an economic growth centre by serving as the hub for business entities both from within and outside the country. The close proximity to Indian markets also provides opportunities for exporting agricultural products easily.

Majority of its population depend on agriculture and livestock rearing. Given its landscape, Sipsu Gewog has abundant opportunities for commercial farming, but extensive destruction of crops by wild animals (especially wild elephant) is withdrawing farmers from initiating commercial farming. The main crops grown in Sipsu Gewog are wheat, paddy, maize and betel-nut. With

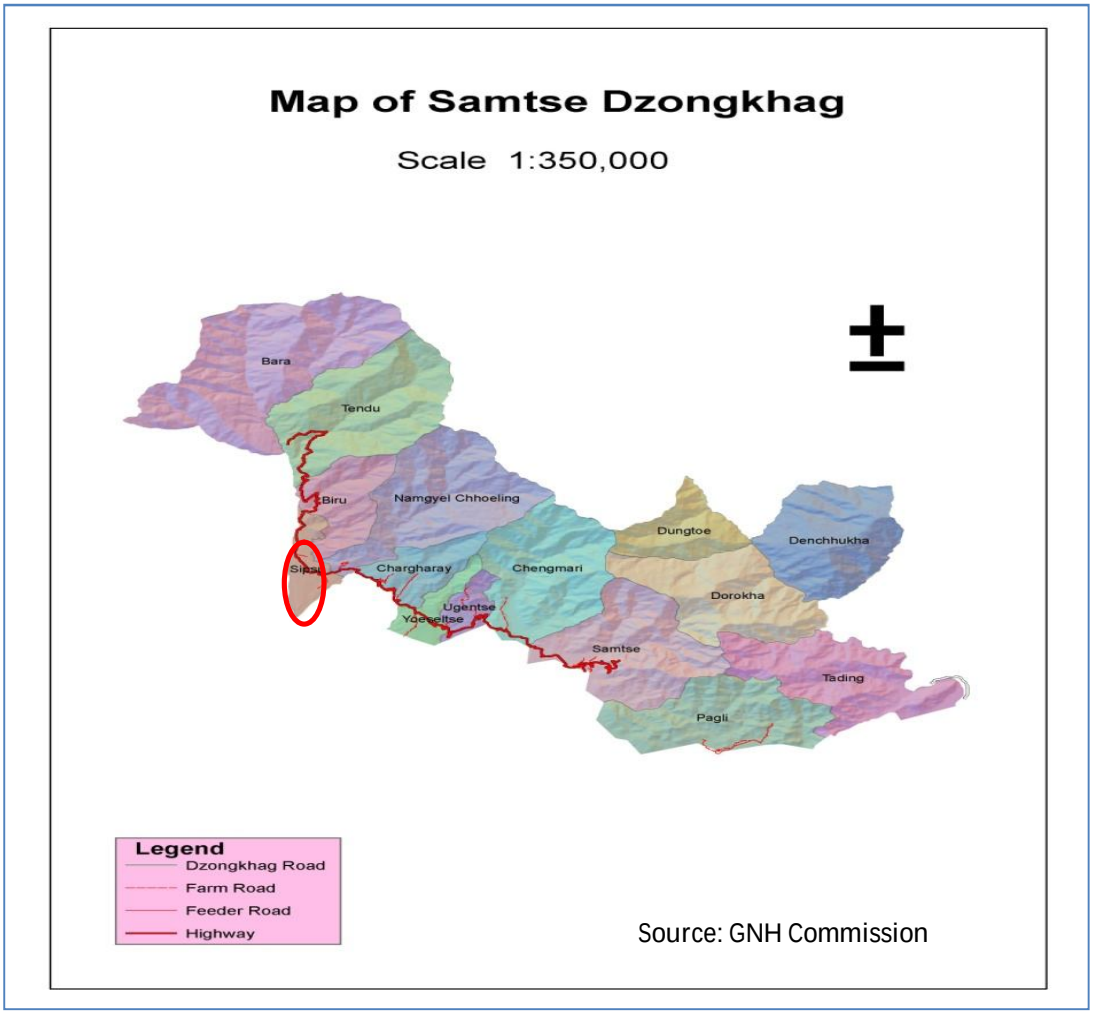

Figure 6. Map of Samtse Dzongkhag

growing demand of betel-nut within the country, farmers in Sipsu Gewog consider betel-nut as the main source of income generating activity. In the formal credit sector, BDFC, BOB, BNBL, PNB are well established in Samtse Dzongkhag. Similarly banking service of BDFC is provided at community level whereby an officer from BDFC meets the farmers at least once a month for loan approval, disbursement and documentation. In the informal sectors, common interest rates are 5% per month but, with variances between borrowers and circumstances. Zero interest loans are mostly between friends and relatives.

Subsequent section discusses the empirical model that is applied in our research. In order to study households' participation in credit market, it is important to study the sequential decision of households. Therefore, the analysis consists of three sections; (1) demand for credit (2) loan rationing in formal/informal sectors and (3) choice for credit sectors/market.

3.2 Empirical Model

Preliminary analysis of data was carried out using descriptive statistics to choose appropriate analytical tools. Different statistical test were performed to check for data normality and multi-collinearity. Finally, a Bivariate PROBIT Model was used to analyse household demand, degree of credit rationing and preferences for credit markets in formal and informal credit sector with the help of STATA software. The rationale behind choosing Bivariate PROBIT Model is because the model is handy in modelling two dependent variables. Further, Bivariate PROBIT Model is appropriate when the two decisions are inter-related. According to Poirier (1980), Bivariate PROBIT Model is a reduced form of two decision taken together or simply join choices of two decision-makers. Further, as noted by (Greene, 2008), Bivariate PROBIT Model generates consistent estimates using standard maximum likelihood estimation. Green (2008) has shown that a joint estimation approach for such a set of equations yields estimators which are asymptotically more efficient than the single equation estimator.

The Bivariate PROBIT Model is frequently used for estimating the effect of an endogenous binary regression on a binary outcome variable (Winkelmann, 2011). The model assumes that the error terms have a bivariate standard normal joint distribution with correlation ρ. Both equations are generated by PROBIT equation and thus the equations are assumed to be correlated. If $\rho = 0$, separate estimations of the equations yields similar results. If $\rho \neq 0$, estimating two separate result will result in bias estimation and therefore, a joint estimation is required. The specification of the model is analysed as follows:

$$Y^*_{1i} = \beta_{1i}X_{1i} + \varepsilon_{1i} \quad \text{——————————} \quad 1$$

$$Y^*_{2i} = \beta_{2i}X_{2i} + \varepsilon_{2i} \quad \text{——————————} \quad 2$$

$$Y_{1i} = 1, \text{if } Y_{1i} > 0, otherwise\ 0$$

$$Y_{2i} = 1, if\ Y_{2i} > 0, otherwise\ 0$$

Where β_{1i} and β_{2i} are parameters to be estimated; X_{1i} *and* X_{2i} are vectors of explanatory variables; and ε_{1i} and ε_{2i} are normally distributed random errors. The error terms are assumed to be independently and identically distributed as bivariate normal with correlation ρ. Rho (ρ) measures the correlation between the outcomes.

$$\text{Cov}(\varepsilon_{1i}, \varepsilon_{2i}) \neq 0$$

1. Firstly, household's decision to participate in credit market is primarily a function of individual demand for credit and degree of loan rationing in credit sectors. At any point of time, household may or may not have demand for credit. In our study, demand for credit is assumed to be existing for those households; (1) having outstanding loans either from formal or informal sectors. (2) Those households who want loan, but their applications are either constraints or simply did not apply as they perceive no chance of getting a loan anyway and (3) households who did not borrow due to fear of rejection of their application/ demand. The dependent variables in the first stage bivariate PROBIT model are demand for formal credit and demand for informal credit. It takes a value of 1 if farmer has a demand for formal and informal credit or 0 otherwise. In our model estimations we assume that the decision of having a formal credit demand and informal credit demand are correlated.
2. Secondly as hypothesised by Zeller, (1994), households demand for credit is at the discretion of lenders to fully or partly, grant or reject their application (demand) for loan. A great deal of emphasis has been put forward in earlier studies on degree of rural loan rationing in credit markets. The paper by Stiglitz and Weiss (1981) is the first theoretical paper explaining true character of credit rationing in presence of imperfect information. Earlier literatures on credit rationing often assumes that households are rationed irrespective of their demand for credit. However, as noted by Kochar (1997), credit rationing is considerably less when taking into account, the level of effective demand and availability of credit source. Considering this framework, we analysed loan rationing by credit sectors to include; (a) if individual want a loan at on-going interest rate (cost) but did not apply due to fear of rejection of their application and (b) if individual applied for loan, but their application were either turned down or households did not get the amount requested. The dependent variable is binary variable and takes value 1 if respondent is credit constrained in the formal (informal) credit and zero otherwise. Similar to credit demand, we assume that being credit constrained in the formal and informal sectors are correlated.
3. The last part of model discusses household's choice for credit markets. According to Sarmistha Pal (2002), households are seen to self-select themselves depending on having or not having a loan either form formal or informal sectors at any particular point of time. Credit choice in our study takes into account only households having outstanding loans during the time of survey. Here again, the dependent variable is binary variables modelling two outcomes. It takes value 1, if households borrowed formal and informal loans, or else 0. In our model estimations, we assume that the decision to borrow formal and informal credit is correlated.

3.3 Livelihoods framework analysing explanatory variables

The selection for explanatory variables (socio-economic characteristics of households) is based on the livelihoods framework adapted by the Department for International Development's Livelihood guidance sheets (DFID nd). We use the framework in identifying and explaining key elements (variables) that are likely to determine household credit choices and degree of loan rationing.

The livelihoods framework (see below, figure 7) is a popularly used concept for analysing and understanding the poverty or wellbeing of particular households, by understanding the basket of assets that make up for a household's total capital. For this study, this framework allows us to classify the variables selected for our analysis into types of assets/ capital as well as to identify their relevance in determining household credit decisions. In our study, we classified the explanatory variables as determined in our model estimates, as particular assets under the following livelihoods determining categories: i.e. Human; Natural; Financial; Physical and; Social. However, it was not possible or feasible to apply other elements of the livelihoods approach, such as vulnerability context and policies and institutions as transforming structures and processes, because, these concepts were too broad and beyond the scope of our study.

In this section, I briefly outline the five different capitals that constitute the livelihood asset pentagon, as relevant to my study. Human capital includes assets relating to individual competencies based on their knowledge, skills, health, nutrition, education and capacity to work. Such assets enhance the ability and capacity of individuals themselves [and therefore of that household] to access basic services (in our study rural credit). In our model, we analysed human assets as relating to gender, age and education of the respondents, as well as the number of school going children, family size and health of all members in the household. The logic behind including these variables under human assets is mainly driven by the idea that these variables represent individual abilities that are likely to affect credit choice and lenders decision to ration their demand. Specifically, we expect that gender of respondents (being male), older people, educated respondents have better access to formal credit markets and therefore to be less constrained. On the other hand variables such as households having higher number of school going children, more number of people in the house (family size) and households where some members are sick and need to visit hospital tend to be liabilities. These variables are expected to influence borrowing from any [less favourable] source such as informal lenders loans, as these variables call for most of immediate and short-term financial requirement.

Natural assets include all assets that are related or relating to the natural environment such as land, water, forests, livestock etc. In our classification, we only included land and livestock under the natural assets category. Although, other natural assets (food, water, forest, etc.) are important variables that may affect households credit decision, we did not consider these

variables to be as crucial in determining borrowing and lending practices. Hence, these other natural assets were not included in our study. As our main focus was to study households credit choice, we expected that households having land [land of higher market value] will have much better access and therefore higher borrowing form formal lenders and at the same we expect that these households are less credit constrained. While, on the other hand we expected that having more livestock may be of advantageous in borrowing informal loans as these assets are considered not as stable as land and therefore not of equal value as land. On the other hand, livestock may be of higher values for the informal lenders as they are less risky.

Financial assets are an important component of livelihoods framework. Financial assets are defined as the financial resources that are available to people, which provide them with different livelihood options. They include savings, credit, insurance, pensions, remittance/s, welfare payments, grants and subsidies. In our classification of variables, we included households' land and off-farm activity under financial assets. Land can be both financial (measured in terms of monetary value) and natural assets (gift of nature). Off-farm activity may provide additional sources of income for farmers during households' income shocks. Off-farm activity especially in the form of remittance can be important determinant of households' credit choice. Therefore, we expect households having an off-farm activity may reduce reliance on both formal and informal loans as households could rely on their family members to smoothen consumption.

Physical assets basically consist of infrastructures and production equipment which enable households to pursue their living. We included owning a vehicle, owning machinery and/or building as financial assets. The reasons behind including these variables under financial assets is because; vehicle, machineries and buildings are assets of households that have tangible or material value. We expect that households owning a vehicle are not only likely to be able to earn more, but they are also more likely to have access to formal loans as a vehicle translates to credit-worthiness in terms of collateral requirements. Similarly, we expect that building values gives a proof of ownership and property rights in borrowing formal loans. On the other hand, households owning machines are more likely to access informal loans because the value of machines we considered in our study is small and may be insufficient in monetary values to serve as collateral requirements in borrowing formal loans.

The concept of social capital/ assets has drawn much research attention. Social capital translates to human relations or interactions with the expectations and demand of mutual reciprocity, support and trust. Social capital therefore forms an integral part of the household's capital that yields mutually beneficial [including financial] responses within a society. The aspect of social capital that resides on individual relations is also widely recognised as an important dimension in studying rural credit. Social assets encompasses of reciprocity, obligation, mutual understanding and shared values. Although, the multiple aspects of social capital are an

important dimension to look into, but they are extremely difficult to measure quantitatively. Further, including such variables may cause endogeneity problems in our model estimates. Therefore in our study, the only variable included under social capital is 'households' event'. This includes mandatory ceremonies and rituals expected of all households as culture and tradition demands. These 'households events' strengthen relationship within the households and between the household and the community. However, ceremonies and rituals require quite significant financial and other expenses. Hypothetically, we assumed that many households would be borrowing from informal sources in order to meet the demand of celebrating these household events, making these events an important part of short-term credit requirements.

The credit situation and behaviour of households in many developing countries are usually impacted by external environmental shocks. As a result households are vulnerable to risks such as disasters, conflicts, droughts, and crop and livestock diseases: seasonality change such as change in price and employment opportunities and: policy changes such as currency exchange rate fluctuations, structural unemployment and poor governance (ADB nd). In the absence of cushioning policy measures and complementary markets, households in rural areas of developing countries often lack the ability and means to cope with damaging losses. Households may therefore use informal credit transaction as an alternative measures to respond to such shocks. However, our econometric model does not take into account the vulnerability context as outlined in the Livelihoods framework.

It is argued in the livelihoods framework approach, that policies and institutions are an essential part of livelihoods analysis. Policies and institutions usually consist of laws, agreements, societal norms that in turn determine the way in which the livelihoods structure operates. Although, policies and institutions (transforming structures and process) are necessary elements that determine households' credit choice, it was difficult to identify all elements governing institutions to incorporate in our study. Further, policies and institutions may be endogenous by its nature and including such variables in our model estimate will result in bias estimation. However, we have outlined some important regulations and policies governing financial institutions (such as interest rate and collateral requirements) that are likely to determine households credit choices as explained in chapter 4 with the help of descriptive statistics.

So, focusing on the asset pentagon, a total of 13 explanatory variables were included in our models. The independent variables included are same in all the three models to capture the similarities and differences of variables in predicting each model. All explanatory variables were assumed to be exogenous or predetermined at the time of loan application. In this research, the focus was to assess how different forms of household assets and characteristics, determine the household's credit choices. The following framework (figure 7) gives an overview of the variables included in our model estimates.

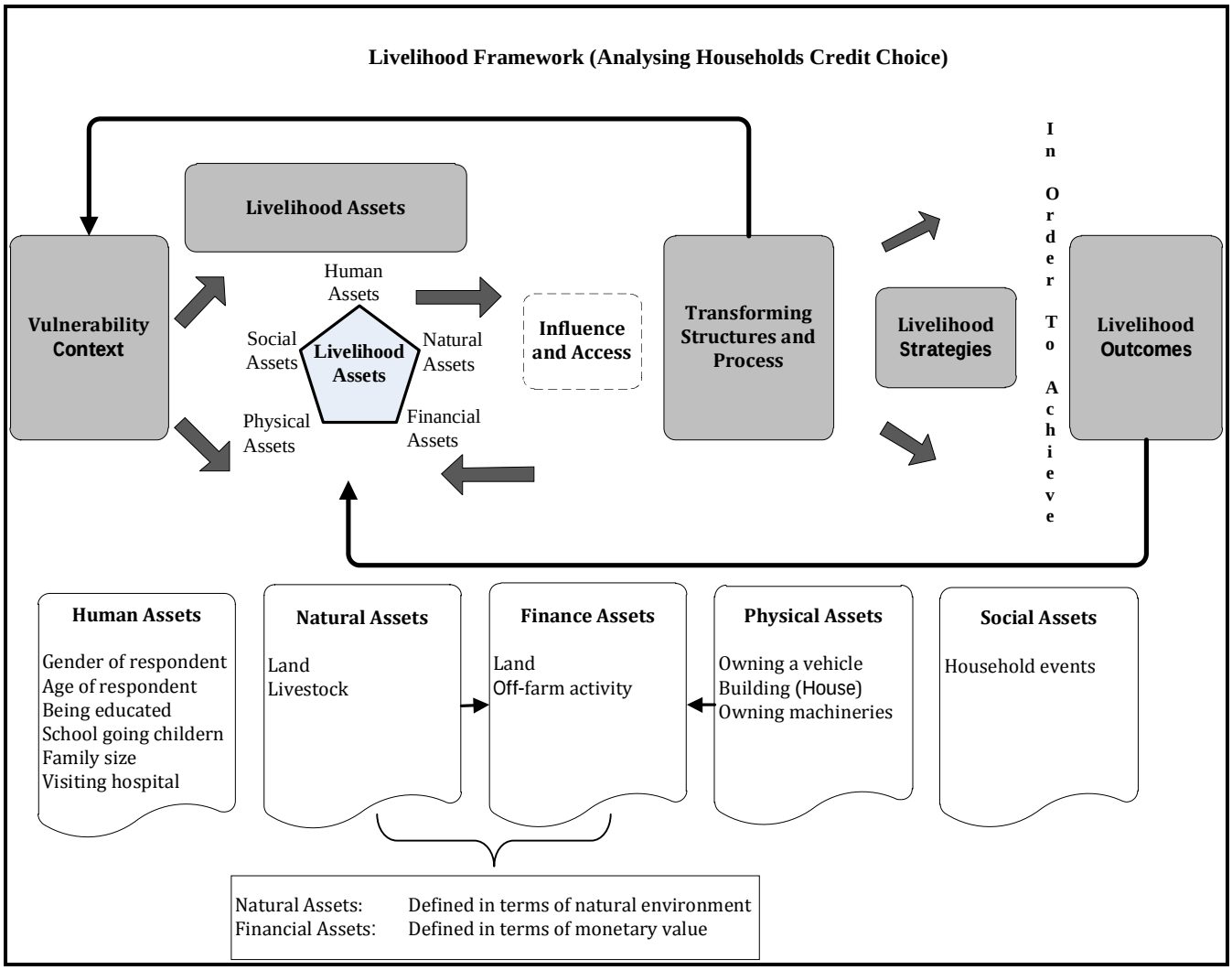

Figure 7(Livelihoods framework)

In summary, explanatory variables included are set of individual and household characteristics.

Human Assets: Gender, age, education, number of school going children, family size and if a household member is sick and need to visit hospital.

Natural Assets: Land and Livestock

Financial Assets: Land value in Euros and an off-farm activity

Physical Assets: House value in Euros; if household owns a vehicle; if household own machinery

Social Assets: Households events

A regional dummy was included to control variation between two districts (1, if respondent is from Gangtay-Phobji Gewogs and 0, if respondent is from Sipsu Gewog).

4. DESCRIPTIVE STATISTICS

This section consists of two parts. First section of this chapter presents an outline of sample distribution of households. Second section presents major characteristics of households that are likely to determine household's participation in credit markets. Specifically, this section provides a concise idea on the sampled data with respect to cost of borrowing and lending characteristics of sectors before we process to analyse econometric models using household's characteristics. Descriptive statistics such as mean, standard deviation, maximum and minimum value were used to compare household participating to that of non-participants in credit markets. In addition t-test and chi-square test were used to explain their significance.

A total of 120 households were successfully interviewed with 60 households from Gangtay & Phobji Gewog under Wangdue Dzongkhag and another 60 households from Sipsu Gewog under Samtse Dzongkhag. The distribution of sampled households and number of borrowers from the respective villages is depicted in table 1.

Table 1. Distribution of sampled households and choice for credit

Dzongkhags	Villages	No of households	Number of borrowers			
			Formal	*Informal*	*Both*	*No borrowing*
Samtse	Singay Gang	13	0	6	1	6
	Peljoring	17	0	7	1	9
	Balbotay	18	2	9	0	7
	Shiwala	12	0	4	0	8
	Sub total	**60**	**2**	**26**	**2**	**30**
Wangdue Phodrang	Moel	10	6	1	1	2
	Yeusa	10	2	1	6	1
	Kilkhorthang	10	8	0	2	0
	Radhay	10	2	0	8	0
	Ghangphay	10	3	1	5	1
	Tangchay	10	4	0	6	0
	Sub total	**60**	**25**	**3**	**28**	**4**
	Total	**120**	**27**	**29**	**30**	**34**

Source: Computed form field data

From a total of 120 respondents, 23% of the households borrow only formal bank loans, 24% borrow only informal loans, 25% borrow from both formal and informal sources and a significant 28% of households do not borrow at all (Table 1). In the formal credit sector, Bhutan Development Finance Corporation was the soul financial institutions from which household borrowed formal credit. The number of household borrowing from formal financial sector is much higher in Wangdue Phodrang Dzongkhag. This may be because; households in Gangtay

and Phobji Gewogs have good internal road network with most of its villages connected by farm and feeder road. The two Gewogs have relatively easy access to major markets thereby providing opportunities to sell their cash crop (especially potatoes) at relatively lower cost. BDFC is well established in these two Gewogs and many developmental activities are taking place. Given its strategic location, tourism activity has increased over the years providing opportunities to diversifying income source other than just agriculture activity.

Formal credit is not popular among households in Sipsu Gewog. Only four households were availing formal loans out of 60 households interviewed. When asked the reasons for not borrowing, 31 households responded that they do not need formal loans, while the remaining households were bit sceptical about their repayment ability. Informal credit transactions are popular among households in Sipsu Gewog. Twenty-six households from a total of 60 households borrowed only informal loans. Informal credit, especially lending activities of commercial moneylenders are mostly between individuals who share a long history of credit transactions.

Respondents were also asked if their applications for loans were rejected. In our study, 25 applicants in the formal credit sector and 31 applicants in the informal credit sectors among the bowers were either turned-down or did not get the amount of loan requested. Similarly, among non-borrowers, 6 applicants in the formal credit sector and 2 applicants in the informal credit sectors were either rejected or did not apply due to fear of rejection of their loan demand (*see Table 2).* In summary, a total of 31 respondents in the formal and 33 respondents in the informal sectors were credit constrained or being rationed in credit markets. Those households whose applications were rejected were asked for reasons why they think their applications were rejected. In the informal sector most of the respondents whose application were rejected are of the view that lenders may have limited money themselves or that they had some important circumstances of their own. Often, many borrowers know for which sector they need to approach, so complete rejection of loan application by the informal lenders are seen to be very rare.

Table 2. Distribution of household being credit constrained

Sectors	Applicants		Non-applicants	
	constrained	***Non constrained***	***constrained***	***Non constrained***
Formal Loan	25	32	6	53
Informal Loan	31	28	2	57

Source computed from field data

Table 3 presents characteristics of loans with respect to repayment periods, loan amount, rate of interest, distance to credit source and expenses incurred in getting the loan. Further, to see the differences and similarities between different segments of credit market, characteristics of loans were compared in the formal and informal sectors with the help of t-test.

The average loan size borrowed from formal sector is much larger (€ 1373) in comparison to informal sectors (€ 354). The differences in means of loan amount from formal and informal credit is highly significant at 1%. This may be due to reasons that informal lenders have limited resources base compared to formal lenders. With respect to expenses incurred while availing loans, the mean differences between the formal and informal sectors is significant at 1%. Borrowing form informal sectors are not necessarily subject to cost (indicated by minimum of zero expenses under informal loans). However, borrowing from formal sector requires at-least some expenses in the form of application fees and legal stamp.

Table 3. Characteristics of loans: Difference in mean between formal and informal credit sectors

Characteristics of loan	Mean Value		T-Statistics	Maximum		Minimum	
	Formal (N=57)	*Informal (N=59)*		*Formal (N=57)*	*Informal (N=59)*	*Formal (N=57)*	*Informal (N=59)*
Loan amount (€)	1373	354	5.29***	6500	6667	167	3
Number of visits (times)	2	1	4.76***	7	3	1	1
Repayment period (days)	424	388	0.62	1440	1800	30	7
Expenses incurred (€)	33	0.82	6.09***	167	8.3	2	0
Distance (KM)	14	11.22	0.28	25	500	1	0.5
Interest Rate/year (%)	13	19	-2.22	15	60	10	0

Source: computed from field data

An average distance households need to travel to the nearest formal credit source is 14 Kilometres with maximum of 250 and minimum of 1 kilometres and households in both Phobji-Gangtay and Sipsu Gewogs are well connected by farms roads. Households requiring higher amount of loans in the formal sectors need to visit the district credit office for additional loan procedures and formalities. In the informal sectors, the average distance households need to travel is 11.22 kilometres, with maximum and minimum of 500 KMs and 0.5 KMs respectively. It is seen that, households even travel longer distances in the informal sectors to avail loans. This is usually the cases when households borrow from relatives who are staying outside villages.

Other characteristics distinguishing formal sector and informal sectors are with respect to the interest rate. The average interest rate in the informal sector is 19% per annum with maximum interest of 60% per annum and minimum of 0% per annum. Zero interest informal loans are commonly provided by friends and relatives in rural areas of Bhutan. Informal loans transaction between friends and relatives are mostly disbursed on basis of trust and relationship between village members. Therefore, it can be seen that formal and informal sectors coexists in-spite of large interest rate differential in rural Bhutan.

Physical collateral is rarely required for availing loan from informal sectors. Most of the transactions are carried on mutual understanding, social capital and reciprocity. In extreme cases, households have to make an agreement on repayment period and instalment frequency, but often such agreements are very rare. However, collateral requirement in the formal sector is necessary. For example, 88% of formal borrowers provided collateral in the form of agriculture land or building, while the remaining 12 % availed group loans, whereby group members were co-guaranteed each other.

Table 4 shows distribution of loans by source and its use both in formal and informal credit sectors. 66.67% of the formal loans were reported used for production only, 5.26% for consumption only, 7.02% for both consumption & production and 21.05% for other use[6]. The use of informal loan is however different from formal loan. 64.41% of the informal sectors reported used for consumption purposes, (mainly celebrating events, visiting hospital or relatives), 13.56% for production, 3.39% for both production & consumption and 18.64% for other use. To summarise, most of the consumption loans were obtained from informal sectors, while production loans were mostly obtained from formal sectors.

Table 4. Use of credit

Sectors	Consumption	production	Production & cons	Other use	Total
Formal	3 (5.26%)	38 (66.67%)	4 (7.02%)	12 (21.05%)	57 (100%)
Informal	38 (64.40%)	8 (13.56%)	2 (3.39%)	11 (18.64%)	59 (100%)

Source: computed from field data

Unlike formal banks, informal lenders were flexible with regard to their lending conditions. In case of loan default, borrowers only pay the accumulated interest and principal amount could be carried forward, although interest is applicable for subsequent years. In certain cases, interests are also paid in secondary form such as labour and output. For some loans, borrowers can even

[6] Other use: building house and buying vehicle

repay as per their conveniences, these loans are usually among friends and relatives without profit motives.

4.1 Socio-economic characteristic of households

The choice of credit market to be used can be determined by number of socio-economic characteristics. Table 5 represents differences in mean between participants and non-participants for continuous variables.

Table 5. Socio-economic characteristic of households for continuous variables

		Borrowers		Non-borrowers		T-Value	Total	
	Characteristics	*Mean*	*Std. deviation*	*Mean*	*Std. deviation*		*Mean*	*Std. deviation*
		(N=57)		**(N=63)**			**(N=120)**	
Borrowing from formal financial sectors	Age of respondents	43	15	52	15	-3.53***	48	16
	Family size	7	3	5	2	2.84***	6	3
	No of school going child	1	1	1	1	0	1	1
	Land value (euro)	45897	43428	47545	49967	0	46762	46787
	Building value (euro)	2804	1319	185	1981	3.08***	2301	1759
	Livestock value (euro)	1513	855	1227	896	1.78*	1363	888
		(N=59)		**(N=61)**			**(N=60)**	
Borrowing from informal financial sectors	Age of respondents	48	14	48	17	-0.14	48	16
	Family size	6	2	6	3	-0.35	6	3
	No of school going child	1	1	1	1	-0.76	1	1
	Land value (euro)	39955	35244	53346	55238	-1.57	46762	46787
	Building value (euro)	2145	1082	2452	2227	-0.96	2301	1759
	livestock value	1368	903	1357	874	0.07	1363	888

Source: computed from field data

*** Significant at 1%, ** significant at 5% and * significant at 10% critical level

Table 5 shows that the difference between means for variable age, family size, building value and livestock value is statistically significant. In general it is observed in table 5 that, formal borrowers are younger with lager family size and higher property value in the form of building, and livestock. Other social factors such as: family size, number of school going children's and value of land, value of livestock's were compared between borrowers and non-borrowers in both formal and informal sectors.

Table 6 shows difference in mean between participants and non-participants for discrete variables. In general, being male, celebrating households' events, an off-farm activity, owning a vehicle and owning machinery are found to be significant for formal borrowing. While, an off-

farm activity, owning a vehicle and owning machinery are found to be significant in informal borrowing (Table 6). Other variables such as: being household's head; visiting hospital; and being educated are compared between borrowers and non-borrowers (*see table 6*).

Table 6. Socio-economic characteristic of discrete variables

Characteristic	Borrowing from formal financial sectors			Borrowing from informal financial sectors		
	Borrowers (N=57) (%)	Non-borrowers (N= 63) (%)	$\chi 2$	Borrowers (N=59) (%)	Non-borrowers (N= 61) (%)	$\chi 2$
Gender (Female)	47	27	5.35**	37	36	0.019
Household head	79	84	0.54	76	87	2.26
Literacy (Literate)	32	41	1.21	41	33	0.8
HH events (celebrated)	91	51	23.29***	74.6	66	1.16
Visited hospital	30	33	0.17	32	31	0.015
With an Off-farm activities	25	67	21.31***	37	56	4.1**
Owning Vehicle	19	7	3.34*	7	20	4.3**
Owning Machinery	67	11	39.40***	46	30	3.4*

Source: computed from field data
*** Significant at 1%, ** significant at 5% and * significant at 10% critical level

5. RESULTS AND DISCUSSION

This chapter is discussed in three stages; first section examines factors determining households demand for credit followed by lenders decision to fully or partly grant or reject households demand for loan (second section). Third section discusses factors determining household choice for credit markets (formal or informal credit sectors). A Bivariate PROBIT Model was used to estimate all the three models.

Prior to running the model, the explanatory variables were checked for multicollinearity. As noted by Verbeek (2008), multicollinearity is a problem when at-least one of the independent variables is linear combination of the others. Two popular methods to test the presence of multicollinearity are Variance Inflation Factor (VIF) and Tolerance (TOL).

$$VIF_i = \frac{1}{1 - R_i^2}$$

Common rule of thumb is that VIFs of 10 or higher value and tolerance of 0.10 or less may indicate problem of multicollinearity. There is no multicollinearity between the explanatory variables in our model as indicated by the mean VIF value of 1.49.

5.1 Demand for credit

Out of 120 households interviewed, 106 respondents were aware of formal credit (bank loan). However, demand for credit exists only for 63 households in the formal sectors and 61 households in the informal sectors due to the mere fact that respondents want loan. The remaining households did not apply for loans simply because they did not want loan or felt that they cannot repay. Determinants of demand for credit are shown in table 7.

The dependent variable is binary and takes value 1, if households has a demand for credit (demand=1), else 0 in the opposite case (demand=0). Wald test is statistically significant indicating the joint probability of the model estimate is non-zero. Rho (ρ) =0 is not rejected at 5%, and therefore it is possible to estimate two equations of the model separately. In other words, estimating individual equation by PROBIT model yields similar results. But as noted by Greene (2008) Bivariate PROBIT Model generates consistent estimates using standard maximum likelihood estimation.

Empirical results from our study shows that households in Phobji-Gangtay are more likely to demand formal loans compared to households in Sipsu Gewogs, (indicated by significance of regional dummy). With access to Indian markets, growing of potato has become the most important cash crop and income generating activity in Phobji-Gangtay Gewogs. Most of the respondents in Phobji-Gangtay are of the view that they need loan especially during potato sowing seasons to buy farm input such as fertilizer and pesticides. Further, households in

Phobji-Gangtay have been depending on formal loans with most of the household availing bank loans. Regional dummy is not significant for households demanding informal loans, indicating that households in Phobji-Gangtay and Sipsu Gewogs are not different in demanding informal loans.

Table 7. Determinants of having a demand for formal and informal loans, robust estimation (Bivariate PROBIT Model)

Explanatory Variables	Formal Loan		Informal Loan	
	Parameters	*Z-statistic*	*Parameters*	*Z-statistics*
Gender	0.361248	0.95	-0.013925	-0.05
Age	-0.0447261	-3.67***	0.0025435	0.32
Education	-0.0209185	-0.06	0.2722946	0.98
Family size	-0.1063681	-1.19	-0.0292043	-0.47
No of school going children	0.074615	0.71	0.0426925	0.38
Household event	0.2291712	0.57	0.3026492	0.97
Health visit	0.0396159	0.12	0.2245369	0.76
Off-farm activity	-0.2639733	-0.69	-0.4339641	-1.48
Land value (€)	-0.000014	-3.02***	-3.07E-06	-0.87
Building value (€)	0.0002549	2.27**	-8.72E-06	-0.06
Vehicle	0.7807118	1.39	-0.8786281	-2.01**
Machineries	0.5518545	1.23	0.7818146	2.18**
Livestock (€)	0.00025	1.13	-0.0001725	-0.96
Regional dummy	1.971698	3.93***	-0.4642395	-1.20
N=120	*** Significant at 1% level, ** Significant at 5% level & * Significant at 10% level			
VIF=1.49				
Wald test of rho=0 Prob. > Chi2 0.1246				
Wald Chi2 (28) 67.61 Prob.>Chi2 0.000				

* Land (in Euro): Present value of land
* Building (in Euro): Present value of building
* Livestock (in Euro) includes present value of livestock's
Gender: Dummy, if respondent is male=1, else 0
Education: Dummy, if the respondent has formal education=1, else 0
Household Event: Dummy, if event is being celebrated=1, else 0
Health visit: Dummy: if respondent visited hospital=1, else 0
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0
Vehicle: Dummy: if respondent owns a vehicle=1, else 0
Machinery: Is respondent owns a machinery=1, else 0
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0

Source: Computed from field data

Age has significant and negative effect for households demanding formal credit, but age does not really matter for households demanding informal loans. Older respondents are less likely to have a demand for formal credit as they perceive not being able to repay the loan. Most of the respondents in their late 50s indicated that they were afraid of defaulting loans. They often consider it unworthy to transfer debt to their younger generations/ children. Additionally, guided by the Bhutanese philosophy, older respondents prefer to stay home practicing Buddhism, which they believes will help them in their next lives (Leaming, 2011). Therefore, it seems that traditional beliefs can be considered as a factor in influencing demand for formal credit.

Value of land is negative and significant for households demanding formal credit. Though land has become a popular perception for reducing credit constraint and increasing disbursement of formal credit, it does not necessarily lead to increasing households demand for formal credit. Higher value of land on the other hand means more income generating capacity and more savings and therefore less demand for formal credit. Contradictorily, with recent increase in demand and price of land due to increasing development activities in rural areas, it has been observed that households were selling their lands. For example, some respondent said that price of land has increased over the years due to increasing economic opportunities and people are more tempted to sell their land. This may be a factor for explaining lower demand for formal loans as households could easily sell their land instead of indemnifying land as collateral for obtaining formal loans. Similar studies done by Barslund and Trap (2008) found land holdings has virtually no impact on probability of demanding formal credit in Long An Province of Vietnam.

On other hand, value of building (house) increases likelihood of demanding formal loans. Rural houses in Bhutan are mostly built with mud, stone and wood. Modern materials such as cement and iron are rarely used in constructing house. This kind of structure and pattern of houses are vulnerable to natural calamities and often requires renovation and improvements instantly. For example, an earthquake that struck in eastern region of Bhutan in 2009 damage a total of 4615 rural households raising concerns particularly of its traditional structure (Langenbach, 2010). Further, such repairs may require huge investment capital which may be difficult to finance by the informal sectors, given their limited lending capacity. Hence, households may still require relying on formal loans in such circumstances, consequently raising the demand for formal loans.

Though, we expected variable education to be significant in demanding formal loan, as we expected educated households to have better understanding and chances of getting a bank loan as hypothesized in section 3.3. But, no such impact was found in our studies. Rather, the relation between educated respondent and formal demand was found to not significant.

In the informal credit sectors, owning a vehicle significantly reduces the likelihood of demanding informal loans. Not many households in rural Bhutan own a vehicle. For example, only 16 out of 120 households own a vehicle. Households owning a vehicle are either too rich or have alternative income sources, resulting in lower demand for informal loans. Additionally, owning a vehicle can lead to diversifying income sources other than just agricultural activities (such as income from transportation of goods). This can be seen as the casual relationship between households owning a vehicle combined with their lower demand for informal loans.

As expected (section 3.3), having agriculture machineries on the other hand increases the likelihood of demanding informal loans. Agriculture machineries considered in this study includes, power tiller, power chain and grinding mills. Value of such machineries is either too small or insufficient in monetary terms to serves as collateral for formal loans (for example the maximum value of power-tiller is €500 and power-chain is €200[7]). This may still require households to rely on informal loans.

Although, we hypothesized that households celebrating events to have significant effect in demanding informal credit, as household's events accounts for most short term loans in rural Bhutan (see section 3.3). But, no such impact was found for in our studies.

5.2 Credit rationing by sectors

Following sequential decision in section 5.1, this section discusses determinants of credit constrain in formal and informal sectors. A total of 31 respondents in the formal and 33 respondents in the informal sectors are credit constrained in our sample. Determinants of loan rationing in the credit market was analysed using Bivariate PROBIT Model (Table 8.) Wald test of the model is significant indicating joint probabilities of the model are not zero. Rho $(\rho) = 0$ is rejected at 5%, and therefore estimating two equations of the model separately will result in bias estimates of parameters. Similar to credit demand in section 5.1, the dependent variables in first and second models are credit constrained in formal and informal sector respectively (if households credit constraint=1, else=0 in the opposite case).

Regional dummy is not significant in both formal and informal sectors indicating no significant differences in loan rationing between Phobji-Gantay and Sipsu Gewog. In the formal sector, regression results considering decision to be rationed significantly decreases with age, being educated and having higher value of land, but increases significantly with value of building/house and households celebrating events.

[7] Values given by respondents (1€=60 Nu)

Table 8. Determinants of being credit constrained in formal and informal sectors, robust estimation (Bivariate PROBIT Model)

Explanatory Variables	Formal Loan		Informal Loan	
	Parameters	*Z-statistics*	*Parameters*	*Z-statistics*
Gender	0.0380004	0.12	-0.0374114	-0.14
Age	-0.0260495	-2.58**	-0.0000818	-0.01
Education	-1.133466	-3.64***	0.6230693	2.16**
Family size	-0.0119383	-0.16	0.0143853	0.23
No of school going children	0.095238	0.7	0.2966373	2.48**
Household event	0.6584539	1.70*	0.5265204	1.42
Health visit	-0.4244389	-1.24	-0.1646726	-0.53
Off-farm activity	0.147901	0.39	0.0215917	0.07
Land value (€)	-0.000013	-2.63***	-0.0000136	-2.64***
Building value (€)	0.0002764	2.43**	-4.24E-06	-0.03
Vehicle	0.4915468	1.07	-0.4690156	-0.94
Machineries	0.3391301	0.84	0.7046742	1.85
Livestock (€)	-0.0000468	-0.25	-0.0004134	-1.93**
Regional dummy	-0.0642643	-0.13	0.0116854	0.03
N=120	*** Significant at 1% level, **Significant at 5% level & *Significant at 10% level			
VIF=1.49				
Wald test of rho=0 Prob. > Chi2 0.0203				
Wald Chi2 (28) 69.57 Prob. >Chi2 0.000				
* Land (in Euro): Present value of land				
* Building (in Euro): Present value of building				
* Livestock (in Euro) includes present value of livestock's				
Gender: Dummy, if respondent is male=1, else 0				
Education: Dummy, if the respondent has formal education=1, else 0				
Household Event: Dummy, if event is being celebrated=1, else 0				
Health visit: Dummy: if respondent visited hospital=1, else 0				
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0				
Vehicle: Dummy: if respondent owns a vehicle=1, else 0				
Machinery: Is respondent owns a machinery=1, else 0				
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0				

Source: Computed from field data

Obtaining formal loan requires collateral and household properties in rural Bhutan are mostly registered upon the head of households which is often headed by older generations. In our

survey, out of 98 household heads, 73 households (i.e. 75%) were non-credit constrained. Average age of respondents being credit constrained is 42 years while that of non-credit constrained is 50 years. Similarly, National Statistical Bureau (2007) has shown that households in rural Bhutan are mostly headed by older people. For example, the average head of household in their study was found to be 59 years. Further, the eligibility for applying formal loan in rural Bhutan is 18 years or above (BDFC, nd). Given these circumstances, it is seen that older people are less rationed by the formal credit sectors. The significance of this variable is in accordance to our hypothesis in section 3.3.

As hypothesized, educated respondents significantly reduce the likelihood of being credit constraint in formal sectors *ceteris paribus*. Formal financial institutions are guided by variety of regulation with regard to loan application in order to reduce the rate of default. Given the cumbersome procedures for applying a loan in a developing country like Bhutan, it is relatively easier for educated household to borrow from formal loans. In our sample only four respondents out of 44 educated respondents are rationed by formal credit sectors. Therefore, educated households are seen to have additional advantage in obtaining formal loans, indicated by their lower probability of being credit constrained.

Value of land which serves as collateral reduces the likelihood of being credit constrained in the formal sectors. Collateral requirement has gained attention in many literatures of loan rationing as a means in solving the problem of asymmetric information (*see Stiglitz and Weiss, 1981, Besley, 1994)*. Not surprisingly, our results shows that bank's perceptions in sorting out risky borrowers and reducing risk of default through use of land as screening devices holds true in our study.

Value of house *ceteris paribus* increases the probability of loan rationing in the formal credit. Unlike in urban areas where housings are used for commercial purposes, rural housing in Bhutan is usually meant for self-occupancy. Banks may therefore foresee rural houses as non-productive investments. In such circumstances, formal sector seem to be more sceptical in disbursing loan on the basis of housing value. This result shows that value of house which can serves as collateral requirement in the formal sector is necessary, but not sufficient conditions for formal sectors.

Surprisingly, celebrating household events increases the likelihood being credit constrained in formal sectors (significant at 10%). Formal credit institutions usually do not observe such celebration while disbursing loans. But, with most of households that celebrated events borrowed formal loans, it may be the result of causal relationship between households celebrating events and formal borrowing. Characterised by religious (Buddhist) landmark, the influence of religion is highly visible in everyday life of lay person. Household events in the form of ritual ceremonies are performed on regularly basis (especially once in year). For example 84

out of 120 households (i.e. 70%) celebrated ritual ceremony. Hence, celebrating events is seen to have an impact on households borrowing formal loans.

In the informal sectors, the likelihood of being credit constrained *ceteris paribus* decreases with value of land and value of livestock, but increases for educated households and number of school going children.

Here again value of land is seen to have affect in sorting out potential borrowers and in-turn effecting lenders decision to be rationed. Similar study done in Madagascar by Zeller (1994) also shows that having higher value of land reduces the probability of being credit constrained in informal sectors.

Secondly, value of livestock which can be sold in case of default reduces the probability of being credit constraint in informal sectors. Livestock rearing forms an integral part of Bhutanese farming system in integration with crop production. Cattle is by far the most import livestock with over 90% of the households owning them for producing milk and ploughing their fields (Ministry of Agriculture, 2012). Informal lenders are more willing to lend if borrowers have livestock which can be either sold or hired for ploughing lenders fields in case of loan default. An alternative explanation could be that higher value of livestock implies higher probability of repayment ability through sales of milk, meat and fibre production. Further, informal lenders may also accept livestock in case of loan default, which is seen as a symbol of wealth and pride in rural Bhutan. On the other hand, households having improved livestock breeds such as Jersey and Brown Swiss may be of higher interest for informal lenders (Samdup, Udo et al 2010). This result also shows that informal sectors are more informed about their borrowers and are willing to accept collateral in the form of livestock which formal sectors cannot due to their lending regulations. This is in accordance to our hypothesis in section 3.3.

Educated respondents are more likely to be credit constrained in informal sectors. Education must be interpreted with caution, since we do not have individual level information on education. However, the significance of education does not correspond with any economic interpretation in our analyses. There is no obvious explanation for this scenario.

Finally, number of school going children increases the probability of being credit constrained in informal sectors. Generally, education in Bhutan is free of charge and rural children receive free stationary and textbooks, but education can still be costly for parents because of the opportunity costs and lack of cash income. Higher number of school going children also means less labour force and lower repayment ability among borrowers. The efficient rationing in the informal sectors therefore depends on ability of lenders to obtain information about creditworthiness of their borrowers.

5.3 Households credit choice

The final section of the model discusses determinants of household choice for credit market. From a total of 120 respondents, 57 households borrowed form formal lenders while 59 households borrowed from informal lenders. The dependent variables in the first and second model take value 1 if households borrowed loans from formal and informal sector respectively or zero otherwise. Determinants of household choice for credit are represented in table 9.

It has been repeatedly argued in recent theoretical and empirical studies by Pal (2002), Barslund and Tarp (2008) that households decision to participate in credit markets depends on various socio-economic characteristics, instead of just rationing, collateral requirements and access to formal credit. We empirically examine their arguments in this section.

Likelihood ratio chi-square is highly significant; reflecting the joint significant of the parameters estimate of the model is not zero. Rho (ρ) =0, Prob. Chi^2>0.47 showing that the null hypothesis of independence cannot be rejected and therefore it is possible to estimate two equations separately. It follows from our estimates that households' choice for formal credit market depends positively on being educated and having higher value of building. But, likelihood of borrowing formal loans decreases with age and value of land.

Similar to the results obtained in section 5.1, regional dummy is statically significant indicating differences in borrowing patterns between households in Phobji-Gangtay and Sipsu Gewogs. This is analogous to the explanation given in section 5.1. In addition, households in Phobji and Gangtay Gewogs have relatively easy access to major markets thereby providing opportunities to sell their cash crop (especially potatoes) at relatively lower cost which requires investment during initial stage of cropping seasons. The use of formal credit is not popular among households in Sipsu Gewog. Only four households were availing formal loans out of 60 households interviewed. When asked the reasons for not borrowing, 31 households responded that they do not need formal loans, while the remaining households were bit sceptical about their repayment ability.

Table 9. Determinants of borrowing from formal and informal loans, robust estimation (Bivariate PROBIT Model)

Explanatory Variables	Formal Loan		Informal Loan	
	Parameters	*Z-statistics*	*Parameters*	*Z-statistics*
Gender	-0.4104896	-0.93	-0.0921847	-0.34
Age	-0.0477045	-3.61***	0.0038477	0.48
Education	0.9871225	1.83*	0.3664376	1.32
Family size	-0.0667979	-0.66	-0.0256761	-0.41
No of school going children	-0.1553381	-1.31	0.0129817	0.12
Household event	-0.378442	-0.68	0.2526137	0.8
Health visit	0.6242301	1.65	0.2960922	1
Off-farm activity	-0.4994027	-1.11	-0.4177696	-1.43
Land value (€)	-0.0000125	-2.56**	-2.99E-06	-0.83
Building value (€)	0.0002438	2.38**	1.35E-06	0.01
Vehicle	0.9586028	1.63	-0.8741737	-1.99**
Machineries	0.8738334	1.6	0.7950779	2.23**
Livestock (€)	0.000374	1.54	-0.0001407	0.414
Regional dummy	3.207521	4.63***	-0.3462314	-0.88
N=120	*** Significant at 1% level, ** Significant at 5% level & * Significant at 10% level			
VIF=1.49				
Wald test of rho=0 Prob. > Chi2	0.4787			
Wald Chi2 (28) 88.46 Prob.>Chi2	0.000			

* Land (in Euro): Present value of land
* Building (in Euro): Present value of building
* Livestock (in Euro) includes present value of livestock's
Gender: Dummy, if respondent is male=1, else 0
Education: Dummy, if the respondent has formal education=1, else 0
Household Event: Dummy, if event is being celebrated=1, else 0
Health visit: Dummy: if respondent visited hospital=1, else 0
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0
Vehicle: Dummy: if respondent owns a vehicle=1, else 0
Machinery: Is respondent owns a machinery=1, else 0
Off-farm activity: Dummy, if member of household work outside farm or agriculture activities=1, else 0

Source: Computed from field data

Although, it was seen in section 5.1 under credit demand model that educated households do not have demand for formal credit. But, it seemed that having lower demand does not necessarily lead to lower formal borrowing. Educated households could easily get loan from formal sectors

as indicated by lower rationing of educated households in section 5.2. Therefore, it can be argued that educated respondents have better access and advantage in borrowing bank loans. Further, it can be argued that educated households can use credit facilities into productive and long-term investments, thereby increasing the likelihood of borrowing. Formal institutions are guided by rules and regulation in disbursing loan and it is therefore relatively easier for educated household to borrow from formal loans. In our study, there are at-least 44 households who can read and write. The reason being that government has initiated the idea of Non-Formal Education (NFE) to provide basic education for those who did not have opportunity for schooling. This is in line with our expectation in section 3.3.

Value of building increases the likelihood of borrowing formal loans. It follows from our estimate in section 5.1 that households with higher value of house have higher formal demand. In addition to explanation in section 5.1, household's having higher building values may require higher capital for renovating and maintaining their houses. Such capital may be difficult to obtain from informal lenders given their limited lending capacity and thereby requiring households to still rely on formal loans. Moreover, with most of households availing loans either to repair or rebuild their houses in rural Bhutan Chhetri (2011), it may be the result of higher demand as indicated in section 5.1.

Age as a determinant of borrowing formal loans is negative and significant. Although, older people are seen to be less rationed by formal credit institutions but, older people have less demand (*section 5.*1) and consequently lower borrowing. Traditional values based on Buddhist culture have a profound influence on the lives of the majority of Bhutanese people. Often it is believed that individual's decision and behaviour in today's life transmit to next life. Many people in their early sixty considered themselves old and they mentioned that they prefer staying home practicing Buddhism. Older people encountered during the interview were afraid of borrowing bank loans as they believe that in case of default, either their property will be seized or put them behind the bars for their inability to pay the loan on time.

Value of land, which is an indicator of repayment ability, is seen to reduce likelihood of borrowing formal loans. Even though, land is seen to have potential affect in sorting out risky borrowers as indicated by lower probability of loan rationing in section 5.2, it is far from being a sufficient condition for increasing households demand and borrowing behaviours. Moreover, as explained in section 5.1, having higher value of land also mean higher income and lower needs for formal loans. Similar studies by Petrick (2004) and Barslund and Tarp (2008) found that value of land is not significant in affecting households' decision to borrow formal loans.

Although, we expected that households owning a vehicle to significant affect in borrowing formal loans. As hypothesized in section 3.3, that households owning a vehicle have better

access to formal loans as a vehicle translates to credit-worthiness in terms of collateral requirements. But, no such impact is found in our result.

The available evidence from our results also suggest that likelihood of borrowing informal loan decreases for households having vehicle, but increases for households having machineries. Here, again regional dummy is not significant indicating no significant differences between borrowers in Gangtay-Phobji and Sipsu Gewogs.

It is observed from our regression result in section 5.1 that households having vehicle reduces the likelihood of demanding informal credit. This is supported at this point by lower borrowing behaviours of informal loans. Moreover, having vehicle leads to diversifying income sources other than just agricultural activities. Additionally, in most villages in rural Bhutan, owning a vehicle is a symbol of wealth and status. Many times households owning vehicles are found to be lenders rather than borrowers.

In contrast, owning machinery increases likelihood of borrowing informal loans. The significant of the variable is supported by higher demand for informal loans in section 5.1. In addition to explanation in section 5.1 under credit demand model, employment of machineries such as power-tiller and power-chain in the lenders fields may be a convenient form of repayment method. This was especially common in our survey area that household employ their power-tillers and power chain in case the borrower for-sees non-repayment of the loan or for repaying their loan. Alternatively, possessing such machineries may not serve the purpose of smoothing households consumption, requiring households to still relying on informal loans. However, owning machinery is found to have no impact in loan rationing (*see section 5.2*).

Although, we hypothesized in section 3.3 that households with an off-farm activities to have significant effect in borrowing both formal and informal loans as they could rely on their families if need arises. But, no such impact was found in our studies. Similarly, we expected households visiting hospital to have significant effect in demanding informal loans as most of medical expenses accounts for immediate and short term requirements. But no such impact was found in our studies.

5.4 Summary of findings

In summary, the following conclusions can be made from our studies:

1. Older people are less likely to borrow formal loans as they perceive not being able to repay loans. However, this is not the case for households borrowing informal loans.

2. Property rights in agricultural land has gain many attentions in theoretical and empirical literatures as a key notion for reducing credit constraint and increasing disbursement of rural credit. Value of land is considered as an indicator of loan repayment ability and therefore it is generally assumed to promote access to rural credit among small and marginal farmers. Although, our results supports the theoretical argument that value of land reduces likelihood of being credit constrained in both formal and informal sectors. But, values of land do not necessarily serve as determinants in borrowing formal credit. Rather, the relation between formal borrowing and value of land was found to be negative and significant.

3. Our result also suggested that value of livestock reduces likelihood of being credit constrained in the informal sectors. This finding confirms that informal lenders are more flexible in terms of collateral requirements and have an information advantage over the formal bank. On the other hand collateral in the form of livestock are less risky for the borrowers. This may be a factor explaining households' choices for informal credit.

4. Most of the short-term loans are borrowed from informal sectors while, formal loans are mostly obtained for production and long-term investments. Short-term loans are usually for duration of one year or less and are mostly used for consumption smoothing or for financing additional expenses such as: celebrating ritual ceremonies, sending children to school and medical expenses.

5. Finally, it is interesting to note here that rationing in the formal credit markets is not the only constraining factor that is limiting households from borrowing formal loans. Rather, informal borrower-lender relationships are acquired on the basis of long-term relationship and social ties within the communities or villages. For example, in our study 42 out of 120 households participated in both informal lending and borrowing activities. The aspect of reciprocity, trust and goodwill can therefore be considered as significant factor in determining household credit choices.

6. CONCLUSION AND RECOMMENDATIONS

This paper presented an empirical analysis of the sequential process in determining households demand for credit; loan rationing in credit markets and; households credit choices in rural Bhutan. A field survey was conducted in which primary data were collected using structured questionnaires. A total of 120 households were interviewed and the study used both descriptive statistics and econometric analysis in drawing statistical inferences. Despite Royal Government of Bhutan's continued emphasis for extension of rural credit since 1975, the use of formal credit is still not popular among households in rural Bhutan in view of the fact that significant households do not have any demand for formal credit. Such reasons may be due to the availability of low-cost substitute of formal loans especially among friends and relatives or the unavailability of formal credit in times of needs. Alternatively, many other socio-economic factors determine household choice for credit market, of which key the notion or perception of social is capital, reciprocity and goodwill that are portrayed by the informal credit lenders. A household's decision to take formal credit market also depends on complementary markets available to productively use the credit. In Bhutan, such markets are usually absent in remote, rural settings and are further disadvantaged by lack of appropriate communication facilities, inefficient transportation systems and lack of enterprise networking.

The main research questions to be answered in this study are:

MRQ.1 Do the farmers want credit? (Demand for credit)

In section 2.4 we hypothesised that demand for credit depends on; source of credit, cost of borrowing, use of credit and socio-economic characteristics. In our study, demand for credit existed for 63 households in the formal sector and 61 households in the informal sector. In the formal sector, BDFC is the sole banking sector mentioned by respondents from which households borrowed. While, in the informal sectors the main source of credit are found to be local moneylenders, friends, relatives, shopkeepers and government employees. In terms of credit cost measured as expenses incurred while availing loans and distance to nearest credit source (KMs), we also found evidence that informal credit hardly incur any expenses. Sometimes households do not even have to visit lenders to obtain the loan. They could simply make an arrangement over the phone. These are loans especially obtained from friends and relatives. In terms of credit use, 5.6% of the formal loans were reported used only for consumption, while 67% were reported used for production only. On the other hand, 38% of the informal credit were reported used for consumption, while 8% were reported used for production purposes (see table 4).

Demand for credit was further analysed in section 5.1 using Bivariate PROBIT Model. We found that older people and households having higher value of land have lower demand for formal loans, while households having higher building value have higher demand for formal loans. Similarly, in the informal sectors households owning a vehicle have lower demand while, households having machineries have higher demand.

MRQ.2 what are determinants of credit rationing? (Loan rationing)

Loan rationing is primarily a function of demand for credit. Descriptive statistics was used in explaining; use of credit; collateral requirements and credit history (*see chapter 4*). In our study 25 applicants in the formal and 31 applicants in the informal sector were credit rationed. Collateral was rarely required in the informal sectors to avail the loan. However, collateral requirement was is essential for borrowing formal loans. In terms of credit history, most of the households had not even borrowed once and for those that borrowed, they started very recently. In the informal sectors borrowers relying on informal sectors are seen to have long credit history.

Similar to demand for credit, socio-economic characteristics was modelled with econometric analysis (Bivariate PROBIT Model). In the formal sector, our regression result concerning decision to be rationed decreases with value of land, age and educated households, but increases with value of building and households celebrating social events. In the informal sectors, loan rationing decreases with value of land and livestock's but, increases with number of school going children and educated households (*see section 5.2*). It seems that loan rationing in the formal sectors are due to lending conditions and the problem of imperfect information, while for the informal sector is due to limited resources based (*see table 3*).

MRQ.3. which source do farmers prefer to borrow and why? (Choice for credit market)

We hypothesised in section 1.5 that choice of credit depends on; cost of borrowing (such as number of visits, expenses incurred, distance to credit sources); lending characteristic of credit market (such as assistance wile availing loans, rate of interest, loan size, repayment period, collateral requirements) and household characteristics (such as age, education, family size, school going children's household events, type of assets).

From a total of 120 respondents, 57 households borrowed from formal lenders, while 59 households borrowed from informal lenders. Descriptive statistics was employed in explaining lending characteristics and cost of borrowing (*see chapter 4*). Interest rate may not be a factor limiting households from borrowing informal credit. As noted in chapter 4, interest rates in the informal sectors are sky high with an average 19% per annum compared to 14% per annum in the formal sectors. Moreover, factors such as collateral requirements, possibility of getting zero

interest loan and unavailability of formal loans in times of needs may persuade households' to borrow informal loans.

With respect to household's characteristics, the likelihood of borrowing formal loan increases with building value and educated households. But, decreases with value of land and age. Similarly, in the informal sector the likelihood of borrowing increases for households owning machinery but decreases for households owning vehicles (*see section 5.3*)

Based on our research, some policy implication can be drawn:

- We argued that a crucial dimension of credit–namely rural insurance has been neglected. When insurance markets are underdeveloped, households use informal credit in order to cope with external environmental shocks. Future research should focus on how informal credit transaction serves as measures in coping with risks in absence of proper insurance markets (the vulnerability context in section 3.3)

- Employment of time-series data to further study (prove) the dependency of households on informal lenders over the years would be useful for leading rural credit scheme in Bhutan. This will also help policy makers to design proper credit scheme as well as to predict future scenario of rural credit scheme.

- Finally, it is often forgotten that, rural credit needs to be accomplished by complementary markets such as enterprise network and agriculture marketing. Therefore, a study to look into possible complementary markets to allow farmers using loan facilities for productive investment should be considered important factor for household's credit choice.

6.1 Limitation of the study

The findings of this study should be evaluated in light of the following limitations:-

Although, our sample was enough to evaluate and test the hypothesis, but it contained only cross-section data that can provide the situation of Bhutanese farmers between the month of August and September 2011. In order to study dynamic relationship and go beyond statistical inferences, a longitudinal study involving time-series data is needed. Such longitudinal studies can provide solution to policy makers in designing proper investigation on rural credit and its limitations. A shortcoming of this study is that it relies only on individual's subjective assessment of their situation. As much as honest responses was desired, respondents being aware of the fact they were being interviewed made them respond more positively rather than being less judgemental and providing the fact. Sensitive questions concerning the respondent's wealth, amount of loan, repayment scheme, and other related questions in the sampled households did not fully consent to participate and those that did were very sceptical in providing relevant information.

This research only focuses on rural credit market and ignores the role of rural credit in absence of proper insurance scheme. Therefore, it would be interesting to see the role of credit in absence of insurance scheme and how insurance and credit system can be correlated or linked. Generally it is assumed that households in rural areas of developing countries are risk adverse and agricultural income is inherently uncertain (the vulnerability context as outline in section 3.3). Poor harvest and low price can thus result in unfortunate turn of event in those circumstances. In such situations, it would be interesting to see how households depend on informal arrangements (credit) to cope up with the risk.

As stated in section 3.3, the multiple aspects of social capital are an important dimension to look into functioning of rural credit. But we did not include all components of social capital in our study because social capitals are extremely difficult to measure quantitatively.

Given the limited sample size, our empirical analyses have focused only on formal and informal segment of credit markets. No distinction between commercial and non-commercial lenders in the informal sectors could be made. A larger sample representative would give more insight in distinguishing potential differences between various segments of rural credit system.

Finally, due to lack of historical background or pre-recorded data on this kind of research in Bhutan, it was quite challenging to provide a comparative analysis on rural credit scheme in Bhutan. Further, given the settlement pattern and the difficult geographical terrain of the chosen Gewogs, only a limited sample of 120 households could be interviewed within the limited timeframe.

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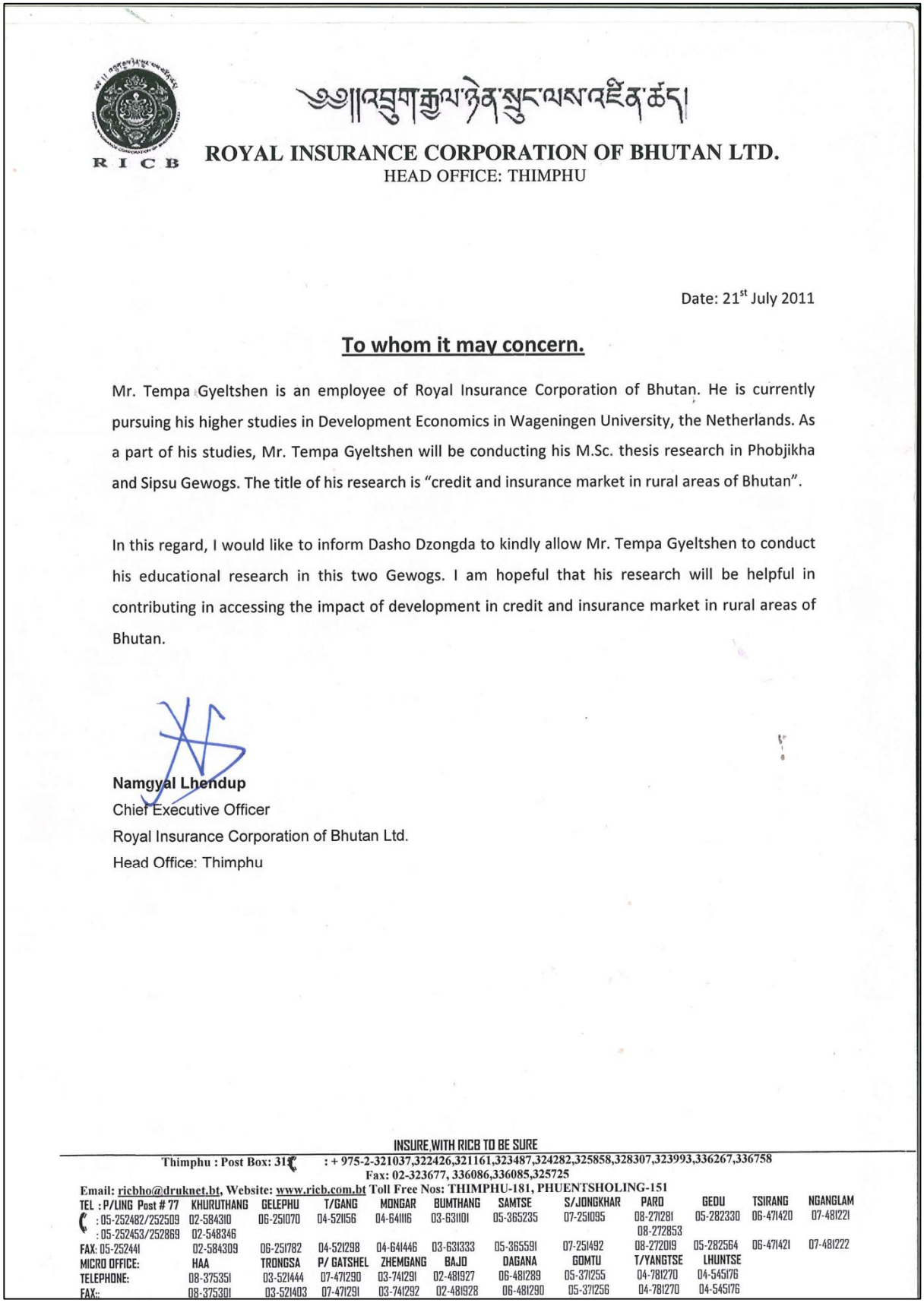
8. APPENDIX I (Bivariate PROBIT Model)

Explanatory variable	Demand (Formal loan)			Constrained (Formal)			Borrowing (formal)		
	Coefficient	*Z*	*P-value*	*Coefficient*	*Z*	*P-value*	*Coefficient*	*Z*	*P-value*
Gender	0.07252	0.21	0.831	0.0011866	0	0.997	-0.6061973	-1.55	0.121
Age	-0.0381297	-3.78	0.00	-0.0268691	-2.73	0.006	-0.0365829	-3.18	0.001
Education	-0.2391165	-0.74	0.457	-1.159934	-3.57	0	0.1852967	0.51	0.607
Family size	-0.0549571	-0.71	0.478	-0.0146127	-0.2	0.845	-0.0084122	-0.1	0.923
No school child	-0.0007266	-0.01	0.995	0.0814642	0.6	0.547	-0.1458159	-1.21	0.227
Household event	0.819743	2.34	0.020	0.6576613	1.73	0.084	0.9015144	2.24	0.025
Health visit	-0.2398021	-0.8	0.422	-0.4041831	-1.19	0.232	-0.0676184	-0.2	0.839
Off-farm activity	-0.7250098	-2.22	0.027	0.1652477	0.48	0.628	-0.9911564	-2.77	0.006
Land value	-0.0000112	-2.92	0.003	-0.0000129	-2.66	0.008	-9.92E-06	-2.53	0.011
Building value	0.0003411	2.79	0.005	0.0002684	2.42	0.016	0.0003724	2.86	0.004
Vehicle	0.5618257	1.01	0.315	0.5508799	1.18	0.237	0.5751022	1.11	0.267
Machineries	1.220353	3.22	0.001	0.3353545	0.93	0.354	1.576169	3.94	0.000
Livestock	0.0002156	1.17	0.241	-0.0000484	-0.26	0.794	0.0002811	1.49	0.135
INF	-0.17474	-0.3	**0.763**	-0.643423	-0.75	**0.453**	0.0974537	0.2	**0.84**
	Demand (Informal Loans)			**Constrained (Informal)**			**Borrowing (Informal)**		
Gender	0.0280518	0.1	0.917	-0.0379305	-0.14	0.888	-0.051031	-0.19	0.85
Age	0.0035574	0.43	0.664	-0.0000284	0	0.997	0.0050241	0.61	0.541
Education	0.346769	1.26	0.208	0.6223889	2.2	0.028	0.4287788	1.54	0.123
Family size	-0.0410975	-0.67	0.505	0.0141079	0.23	0.82	-0.0350619	-0.56	0.574
No school child	0.0607892	0.54	0.586	0.299789	2.51	0.012	0.0260312	0.24	0.81
Household event	0.1704812	0.57	0.567	0.5290594	1.52	0.129	0.1446556	0.48	0.63
Health visit	0.2747654	0.95	0.343	-0.1642998	-0.53	0.593	0.3328317	1.15	0.249
Off-farm activity	-0.2995406	-1.05	0.295	0.0172745	0.06	0.955	-0.327098	-1.13	0.256
Land value	-2.49E-06	-0.72	0.475	-0.0000138	-2.62	0.009	-2.58E-06	-0.72	0.474
Building value	-0.0000479	-0.37	0.711	-3.68E-06	-0.03	0.979	-0.0000129	-0.12	0.907
Vehicle	-0.9307997	-2.15	0.032	-0.4615581	-0.92	0.355	-0.9048019	-2.08	0.037
Machineries	0.6767202	2.14	0.032	0.7094444	2.02	0.043	0.7029436	2.27	0.023
Livestock	-0.0001895	-1.06	0.287	-0.0004145	-1.92	0.055	-0.0001549	-0.92	0.36
INF	-0.7134973	-1.36	**0.173**	0.1423374	0.28	**0.779**	-0.6655621	-1.31	**0.189**

9. APPENDIX II (Approval letter)



ROYAL INSURANCE CORPORATION OF BHUTAN LTD.
HEAD OFFICE: THIMPHU

Date: 21st July 2011

To whom it may concern.

Mr. Tempa Gyeltshen is an employee of Royal Insurance Corporation of Bhutan. He is currently pursuing his higher studies in Development Economics in Wageningen University, the Netherlands. As a part of his studies, Mr. Tempa Gyeltshen will be conducting his M.Sc. thesis research in Phobjikha and Sipsu Gewogs. The title of his research is "credit and insurance market in rural areas of Bhutan".

In this regard, I would like to inform Dasho Dzongda to kindly allow Mr. Tempa Gyeltshen to conduct his educational research in this two Gewogs. I am hopeful that his research will be helpful in contributing in accessing the impact of development in credit and insurance market in rural areas of Bhutan.

Namgyal Lhendup
Chief Executive Officer
Royal Insurance Corporation of Bhutan Ltd.
Head Office: Thimphu

INSURE WITH RICB TO BE SURE

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TEL : P/LING Post # 77	KHURUTHANG	GELEPHU	T/GANG	MONGAR	BUMTHANG	SAMTSE	S/JONGKHAR	PARO	GEDU	TSIRANG	NGANGLAM
: 05-252482/252509	02-584310	06-251070	04-521156	04-641116	03-631101	05-365235	07-251095	08-271281	05-282330	06-471420	07-481221
: 05-252453/252869	02-548346							08-272853			
FAX: 05-252441	02-584309	06-251782	04-521298	04-641446	03-631333	05-365591	07-251492	08-272019	05-282564	06-471421	07-481222
MICRO OFFICE:	HAA	TRONGSA	P/ GATSHEL	ZHEMGANG	BAJO	DAGANA	GOMTU	T/YANGTSE	LHUNTSE		
TELEPHONE:	08-375351	03-521444	07-471290	03-741291	02-481927	06-481289	05-371255	04-781270	04-545176		
FAX::	08-375301	03-521403	07-471291	03-741292	02-481928	06-481290	05-371256	04-781270	04-545176		

དཔལ་ལྡན་འབྲུག་གཞུང་།
རྫོང་ཁག་བདག་སྐྱོང་། བསམ་རྩེ།
Dzongkhag Administration
Samtse

SD/ADM-48/2011-2012/ 854 17.8.2011

Offtg. Dungpa
Dungkhag Administration
Sipsu.

Dear Sir,

This is to inform you that Mr. Tempa Gyeltshen, an employee of Royal Insurance Corporation of Bhutan, Thimphu currently pursuing his higher studies in Development Economics in Wageningen University, Netherlands. He is requesting to conduct households interview with the farmers of Sipsu Geog for thesis research.

In this regard, you are directed to render necessary support to Mr. Tempa Gyeltshen during his stay at Sipsu Geog.

Yours sincerely,

Kamala Gurung
Adm. Officer

Copy to :-

1. Gup, Geog Administration, Sipsu for necessary action.

Dzongkhag Administration, Post Box No. 301, Dasho Dzongdag: 05-365308, Telefax:-05-365347, Dasho Dzongrab: 05-365304, Telefax:-05-365305, Sr. Accounts Officer: 05-365377, Administrative Officer 05 365540

10. APPENDIX III (Questionnaires)

Questionnaire

Name of the student : Tempa Gyeltshen
Name of the university: Waginengen University, the Netherlands.

Respondent Number :_____Mobile Number:_____
Sex : Male/Female
Name (optional) :_____ Age :_____

If respondent is not the head of household
Name of household's head :_____ Sex: Male/Female
Village :_____ Gewog :_____
Dzongkhag :_____

In this section, I would like to know something about your family and your livelihoods

1. What is your level of education? *(if the respondent is the head of household go to question 3)*

   1. Primary 2. Secondary 3. Higher 4. No education 5. Others

2. What is the level of education of the household head?

   1. Primary 2. Secondary 3. Higher 4. No education 5. Others

3. What is the size of your family? Please exclude those members who stayed with you for less than 9 of 12 months?

Adult	Children	Elderly	Total

4. Are there any school going children? *(if no go to question 6)*
   - ☐ Yes ☐ No

5. What is the numbers of school going children's? Please include all children's who are financially depended even if they are not staying with you currently.

Primary	Secondary	Higher	University

6. Did you celebrate any household event? (In last 12 months)
   - ☐ Yes
   - ☐ No *(if no go to question 8)*

7. What kinds of event you celebrated? *(allowed for multiple answers)*

   1. Wedding 2. Puja 3. Others

8. Have you or any member of your family visited a health centre for treatment in the last 12 months *(Only if it has direct implication on your household expenditure*)
   - ☐ Yes
   - ☐ No

9. What are different types of crop grown in your community? What was the average production quantity of each per year? If you sell how much money do you earn from selling them?

Name of crops	Average yield/year (in unit)	Amount earned /year (Approx)	Remarks
1.			
2.			
3.			
4.			

Mention the unit given by farmers. Convert to standard unit (kg) later

10. Do any of your family member works outside your farm?
    - ☐ Yes
    - ☐ No (if no go to question 12)

11. What are different kind of off-farm activities/employment and their contribution to your household?

Category	Amount/year	Remarks
1.		
2.		
3.		
4.		

Remarks_____

12. What are different types of assets you own and its present value? *(allowed for multiple answers)*

Category	Number	Present value	Remarks
1. Livestock Goat Sheep Cattle Horse Pig			
2. House/building			
3. Land in Acre			
4. Vehicles			
5. Power tiller			
6. Power chain			
7. Others *(please specify)*			

In this section, I would like to know about the loans you borrowed from the formal financial institutions including the NGOs. Please include all the loans borrowed even if it's repaid.

1. If need for loan arises in your community or sub-district, which formal financial sectors do you know that you could go for? *(answer in column I)*	2. From the above formal financial sectors that you have mentioned, which ones do you go for? *(answer in column II)*	3. In the last 12 months, did you borrow loans from the formal financial sectors? Include all loans availed, even if its repaid (allowed for multiple answers) *(if no borrowing is made, write 0 and go to question 5)* *(answer in column III)*	4. In the last 12 months how many times did you borrow loans from formal financial sectors? *(answer in column IV)*	5. When was the last time you borrowed from any formal financial sectors? *(if no borrowing is made, write 0 and go to question 6)* *(answers in column V)*	6. What are the reasons for not borrowing? 1. No collateral 2. Not aware of loans 3. No need of loans 4. Fear of rejecting 5. Others *(answers in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
BDFCL					
NGOs					
Others *(Please specify)*					
No borrowings					

7. Do you receive any services/assistance while availing these loans? Yes -----✓ No------✗ *(answer in column I)*	8. How far is the office of the lender? (Approx distance in kilometres) *(answer in column II)*	9. Did you have to visit the lender at the office to obtain loans? *(answer in column III)*	10. How many visits did you have to make to obtain the loan? *(answer in column IV)*	11. What is the total amount you borrowed from each formal financial sectors in the last 12 months (Maximum amount for each borrowing. Figure in Ngultrum) *(answer in column V)*	12. Do you have to pay interest on this loans; what is the rate of interest? *(answer in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
BDFCL					
NGOs					
Others *(Please specify)*					
No borrowings					

13. What is the frequency of instalments? 1. Daily 2. Weekly 3. Monthly 4. Half yearly 5. Yearly 6. No Schedule *(answer in column I)*	14. What is the amount you need to pay at each instalment? *(answer in column II)*	15. What is the repayment period for the loan you have availed? 1. One year 2. Two years 3. Three years 4. Four years 5. Five years or more 5. No Schedule *(answer in column III)*	16. What are the main reasons for borrowing or obtaining these loans? *(allowed for multiple answers)* 1. Buying farm input 2. Buying heavy equipment's 3. Buy animals 4. Buy agricultural land 5. Others *(answer in column IV)*	17. What kind of collateral did you provide to obtain this loan? *(allowed for multiple answers)* 1. Agricultural land 2. Buildings 3. Guarantee 5. Vehicles 6. Labour 7. Saving 8. Others *(answer in column V)*	18. In order to get this loan how much did you have to spend on? 1. Payment in kind 2. Promissory note 3. Application fee 4. Closing cost 5. Others *(answer in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
BDFCL					
NGOs					
Others *(Please specify)*					
No borrowings					

19. Do you get the amount of loan you requested? Or what is the amount you applied? Yes---✓ No----✗ *(answer in column I)*	20. Overall how do you rate the lending terms and conditions of these institutions? 1.Excellent 2. Good 3. Satisfactory 4. Bad *(answer in column II)*	21 Did any of the above sectors refused/turndown to lend you loans? Yes---✓ No----✗ *(answer in column III)*	22. Why you were turned down/why they refused to lend loans to you 1. Investment not accepted 2. Not enough income 3. Bad credit history 4. No collateral 5. Others *(answer in column V)*

Column I	***Column II***	***Column III***	***Column IV***
BDFCL			
NGOs			
Others *(Please specify)*			
No borrowings			

In this section, I would like to know on the loans you borrowed from local money lenders, friends and relatives. Please include all the loans borrowed even if it's repaid.

1. Do you borrow loans from the informal financial sectors? Yes -----✓ No------× *(answer in column I)*	**2.** In the last 12 months, did you borrow loans from the informal financial sectors? Include all loans availed, even if its repaid *(allowed for multiple answers)* *(if no borrowing is made, write 0 and go to question 4)* *(answer in column II)*	**3.** In the last 12 months how many times did you borrow loans from the informal financial sectors? *(answer in column III)*	**4.** When was the last time you borrowed from the informal financial sectors? *(if no borrowing is made, write 0 and go to question 5)* *(answer in column IV)*	**5.** What are the reasons for not borrowing? *(allowed for multiple answers)* 1. No collateral 2. No need of loans 3. Fear of rejecting 4. Others	**6.** Do you receive any services/assistance while availing these loans? Yes -----✓ No------× *(answer in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
Local moneylenders					
Monastic bodies					
Friends					
Relatives					
Others *(Please specify)*					

7. How far is the office of the lender? (Approx distance in kilometres) (answer in column I)	**8.** How many visits did you have to make to obtain the loan? (answer in column II)	**9.** Did you have to visit the lender at the office to obtain loans? Yes---✓ No----× (answer in column III)	**10.** What is the total amount you borrowed from each informal financial sectors in the last 12 months (Maximum amount for each borrowing. Figure in Ngultrum) (answer in column IV)	**11.** Do you have to pay interest on this loans; what is the rate of interest? Yes No (answer in column IV)

Column I	***Column II***	***Column III***	***Column IV***	***Column VI***
Local moneylenders				
Monastic bodies				
Friends				
Relatives				
Others *(Please specify)*				

12. What is the frequency of instalments? 1. Daily 2. Weekly 3. Monthly 4. Half yearly 5. Yearly 6. No Schedule *(answer in column I)*	**13.** What is the amount that you need to pay at each instalment? *(answer in column II)*	**14.** What is the repayment period for the loan you have availed? 1. One year 2. Two years 3. Three years 4. Four years 5. Five years or more 5. No Schedule *(answer in column III)*	**15.** What are the main reasons for borrowing or obtaining these loans? *(allowed for multiple answers)* 1. Buying farm input 2. Buying heavy equipment's 3. Buy animals 4. Buy agricultural land 5. Others *(tick answers in column IV)*	**16.** What kind of collateral did you provide to obtain this loan? *(allowed for multiple answers)* 1. Agricultural land 2. Buildings 3. Guarantee 4. Machineries 5. Vehicles 6. Labour 7. Saving 8. Others *(answer in column V)*	**17.** In order to get this loan how much did you have to spend on? 1. Payment in kind 2. Promissory note 3. Application fee 4. Closing cost 5. Others *(answer in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
Local moneylenders					
Monastic bodies					
Friends					
Relatives					
Others *(Please specify)*					

18. Do you get the amount of loan you requested? Or what is the amount you applied? Yes---✓ No----✗ *(answers in column I)*	**19.** Overall how do you rate the lending terms and conditions of these institutions? 1.Excellent 2. Good 3. Satisfactory 4. Bad *(answers in column II)*	**20.** Did any of the above sectors refused/turndown to lend you loans? Yes---✓ No----✗ *(answers in column III)*	**21.** Why you were turned down/why they refused to lend loans to you? 1. Investment not accepted 2. Not enough income 3. Bad credit history 4. No collateral 5. Others *(answers in column IV)*	**22.** In what form do you pay back the money? 1. Cash 2. Standing crops 3. Labours 5. Others *(answers in column V)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***
Local moneylenders				
Monastic bodies				
Friends				
Others *(Please specify)*				

In this section, I would like to know if you have lent any loans to your relatives, friends and villagers within the last 12 months. Please include all the loans you have lend even if it's repaid.

1. Does anyone owe you money at present? Yes---✓ No----× *(answer in column I)*	**2.** Who is the person borrowed from you? 1. Relatives 2. Friends 3. Tenants 4. Others *(answer in column II)*	**3.** What are the main reasons this person borrowed from you? *(allowed for multiple answers)* 1. Buying farm input 2. Buying heavy equipment's 3. Buy animals 4. Buy agricultural land 5. Personal use 5. Others *(answer in column III)*	**4.** What collateral did this person provided you? *(allowed for multiple answers)* 1. Agricultural land 2. Buildings 3. Guarantee 4. Machineries 5. Vehicles 6. Labour 7. Saving 8. Standing crops 9. Others *(tick answers in column IV)*	**5.** In what form the person repay the loan? *(allowed for multiple answers)* 1. Cash 2. Standing crops 3. Labours 5. Others *(answer in column V)*	**6.** What amount did the person borrow? *(answer in column VI)*

Column I	***Column II***	***Column III***	***Column IV***	***Column V***	***Column VI***
Relatives					
Friends					
Tenants					
Others *(please specify)*					

7. When did the above mentioned person borrowed from you?

_____

11. APPINDIX IV (Field pictures)