

**DEVELOPING AN INDICATOR OF POVERTY LIABLENESS
THROUGH AN ANALYSIS OF HOUSEHOLD RISK
MANAGEMENT STRATEGIES: A CASE TOWARDS THE
DEVELOPMENT OF A FORMAL SOCIAL PROTECTION
SCHEME IN MALAYSIA**

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June 2013

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ACKNOWLEDGEMENT PENGHARGAAN

Kami ingin merakamkan penghargaan kami kepada Kementerian Pengajian Tinggi Malaysia (MOHE) kerana memperuntukan sejumlah dana di bawah Fundamental Research Grant Scheme (FRGS) untuk kami menjalankan penyelidikan ini. Terima kasih kepada Pusat Pengurusan Penyelidikan dan Inovasi (RIMC) UUM kerana membantu kami dalam urusan pentadbiran sepanjang penyelidikan ini dijalankan. Kami juga ingin merakamkan setinggi penghargaan kepada individu-individu yang terlibat secara langsung atau tidak langsung dalam penyelidikan ini terutamanya mereka yang sudi ditemubual semasa proses kajiselidik ini dijalankan.

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Abstract

Malaysia has been recognized as one of the countries that has successfully reduced the problem of poverty among its population. In 1970, the poverty level stood at 49.3 percent of the total population. The rate was later reduced to 8.1 percent in 1999 before reaching 3.7 percent in 2011 (Department of Statistics Malaysia, 2011). However, the recent trend in the literature that moved towards the re-conceptualisation of poverty in terms of insecurity or vulnerability, have brought out another issue of how poverty should be tackled in Malaysia. In this study, we examined how rural households in Malaysia behaved when faced with a risk and how this would affect their livelihood and therefore the level of vulnerability to poverty. For this purpose, we have conducted a survey on 499 rural households across all the states in Peninsular Malaysia. Our findings show that rural households in Malaysia faced a variety of risks and they have employed several strategies in order to cope with the risks. However, not all these strategies are effective in dealing with the risk and this has resulted in a negative impact on the livelihood of the households. Our study also found that income and savings level are the main factors that will determine the odds for a household to recover from a crisis. The findings of this study imply that there is room for the government or any other relevant authorities to intervene to improve the availability and effectiveness of risk coping strategies of rural households in Malaysia.

Abstrak

Malaysia merupakan salah sebuah negara yang telah berjaya mengurangkan insiden kemiskinan di kalangan penduduknya. Menurut Statistik yang dikeluarkan oleh Jabatan Statistik Negara, kadar kemiskinan pada tahun 1970 adalah 49.3 peratus. Kadar ini telah berjaya dikurangkan untuk mencecah 3.7 peratus pada tahun 2011. Namun, kajian terbaru menunjukkan bahawa isu kemiskinan perlu juga dilihat dari aspek ketidakselamatan dan kelemahan. Kajian ini melihat kepada isu risiko yang dihadapi oleh isirumah luar bandar dan bagaimana risiko tersebut memberi kesan kepada kehidupan mereka dan seterusnya tahap kelemahan kepada kemiskinan. Untuk itu satu kajiselidik telah dijalankan ke atas 499 isirumah luar bandar di Semenanjung Malaysia. Dapatan kajian menunjukkan bahawa isirumah luar bandar terdedah kepada beberapa jenis risiko dan mereka telah menggunakan beberapa mekanisme untuk menangani risiko tersebut. Namun, tidak semua strategi berjaya kerana masih lagi terdapat isirumah yang masih lagi belum keluar sepenuhnya dari krisis yang berlaku. Kajian ini juga menunjukkan bahawa pendapatan dan simpanan

adalah dua faktor utama yang mempengaruhi kemampuan isirumah untuk keluar dari krisis. Dapatan kajian ini menunjukkan bahawa terdapat lagi ruang untuk pihak yang bertanggungjawab untuk memperbaiki kewujudan dan keberkesanan strategi menangani risiko isirumah luar bandar.

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CHAPTER ONE

INTRODUCTION

During the last few decades, Asian economies have experienced tremendous economic growth. According to Balisacan and Fuwa (2007), Asia's gross domestic product (GDP) growth has consistently outpaced those of other regions of the world in the past thirty years. The region's economic growth rate averaged about 4.0 per cent per year, while the corresponding figures for developed countries and the world were about 2.6 per cent and 2.7 per cent, respectively. In these emerging market economies including Malaysia, the relatively strong economic growth experienced during the last few decades have led to a considerable decrease in actual poverty rates.

Nonetheless, despite the tremendous economic growth, the region still accounts for about 60 per cent of the world's 1.1 billion poor. In most of these countries, poverty incidence remains relatively high even in period of high economic growth. It seems that to a certain extent, poverty problem is impervious to economic growth. Therefore, in analysing poverty, it is important to look at other factors than economic growth.

One of the most important factors that may explain why poverty remains an issue in developing countries especially among the rural households is risk and its prevalence especially among the poor. The majority of the poor in developing countries live in rural areas and many of them are dependent on agriculture for their livelihood. However, agricultural activities are subject to various types of risk that may adversely impact the income of rural households. Weather

variations and other environmental factors such as limited and uncertain rainfall, floods or pest infestation will make agricultural income fluctuate greatly from one season to another. And these risks are compounded by other risks such as lack of financial intermediation and formal insurance, credit market imperfections, and weak infrastructure (e.g. physical isolation because of limited transportation facilities). In addition, there has been a concern that the recent successes of market-oriented policy reforms in countries such as India and China or the advance of globalization may have further increased the degree of potential income fluctuations (Dercon 2005; Kurosaki 2006).

The profitability and seasonality of agricultural production affect not just the lives of farmers but also the lives of other people in their communities. This is due notably to the fact that a large proportion of the workers in the rural areas also depend on the agricultural sector. Furthermore, it can be argued that although most of the households in the rural areas are agricultural producers, they also take part in other activities such as salaried employment in agriculture, trade, and other services as well as self-employment in small industries and commercial activities. Other activities, such as commerce or services, are also correlated to the main income generating activity of most of the households. The fluctuations of labour incomes for casual labourers in agricultural sector have been well documented (Lipton and Ravallion 1995). To illustrate, the coefficient of variation in income for farm households found in southern India was 137, while that for white males in late twenties in the US was 39 (Rosenzweig and Binswanger 1993). Thus, the rural areas are particularly vulnerable to systemic shocks (Carlos Andres Alpizar, 2007).

With a relatively small margin for survival among these rural households, the consequences of those risky events can be extremely severe. Those who are not poor may become poor because of a sudden drop in their income. On the other hand, those who are already poor will be in a worse situation and may have to face severe problems such as malnutrition, disease, starvation or even worse, death. Therefore, it is this risk associated with agricultural activities that explain why despite the economic growth experienced by the developing countries, poverty incidences especially among the rural and agricultural dependent households remain relatively high.

In discussing the issue of risk and its relationship with poverty, another notion that arises is vulnerability. As can be seen from the discussion above, the analysis of poverty issue should include not only those who are already defined as poor, but also those who are yet to be considered as poor but are vulnerable to become one because of the risks that they are exposed to.

Vulnerability therefore is a *dynamic* concept associated with the change of welfare or poverty status over time, taking account of not just fluctuating levels of living but also the resilience of subsets of households (e.g. landless, smallholders) against aggregate and idiosyncratic shocks (Gaiha et al., 2007). In the literature, there has been a surge of interest in measuring vulnerability in developing countries (e.g. Chaudhuri et al., 2002; Dercon, 2005; Gaiha and Imai, 2004; Gaiha and Imai, 2006, Hoddinott and Quisumbing, 2003; Ligon, 2005; Ligon and Schechter, 2003). And these studies point to the need for designing anti-poverty policies specifically to address vulnerability.

However, exposure to risk will not necessarily result in poverty. Not all households who are faced with a shock are vulnerable to fall into the poverty trap as some of them may be well prepared to face the shocks. In other words, there are some households who can cope better with a risk than others thus preventing their livelihood from becoming affected by the occurrence of the risks. Therefore, risk management (or risk coping) strategies and their effectiveness are another factor that need to be considered in discussing the issue of poverty and vulnerability.

Furthermore, it is also important to distinguish between *ex-ante* and *ex-post* risk management strategies. Coping with risks can occur in two stages. First, households can smooth income (*ex-ante* risk management strategies). For example, rural households can achieved this by choosing safer but also less profitable production choices and diversifying income-generating activities, for example, crop diversification, plot diversification and income diversification. In this way, households take steps to protect themselves from adverse income shocks before they occur. Second, households can smooth consumption (*ex-post* risk management strategies), which can be achieved by borrowing and saving, selling and accumulating assets, adjusting labour supply, and employing formal and informal insurance arrangements. These mechanisms, which usually take force after shocks occur, help insulate consumption from income fluctuation.

In the literature, studies have shown that rural households in developing countries have created a number of formal and informal instruments to manage risk. However, the capacity of households to cope with a shock depends on a number of factors such as the source of risks, their correlation, frequency as well as intensity. Risks can be natural (e.g., natural disasters) or human-induced (e.g., economic shocks). Risks can be correlated among individuals from the same locality (i.e.,

covariate risk), as in the case of floods or droughts, or be uncorrelated and affect only individual households (i.e., *idiosyncratic risk*), as with illness or accident. Further, risks can be low frequency but with high economic impact (known as catastrophic risk), or high frequency with low economic impact (*non-catastrophic*) (Maleika and Kuriakose, 2008).

The choice of risk management strategies depend on household characteristics, most importantly the diversity and stability of household income sources, household assets and education of the household head (Rashid et al., 2006). For example, households compensate agricultural income loss through off-farm or non-farm employment, asset sales and borrowing (Kochar, 1999; Newhouse, 2005; Kijima et al., 2006). A study on flood and health shocks of Amazonian peasant households in Peru found that coping responses are influenced by local environmental endowments and household asset holdings (Takasaki et al., 2006). Specifically to cope with crop losses from flood, fishing effort intensification by household labour adjustment was found to be a dominant coping activity (Takasaki et al., 2010). While households with high asset levels are more likely to sell accumulated assets and use savings to cope with income loss, poor households are refrained from using savings and borrowing against assets but more likely to find work off-farm to compensate for income loss (Berloff and Modena, 2009; Hoddinott, 2006). Heltberg and Lund (2009); Dercon (2007) also found that disposition of savings and assets, income diversification especially from off-farm employment and informal credit help households to cope with income shortfalls as a consequence of shocks.

It can be concluded from the above discussion because of economic and financial crises, large fluctuations in food and energy prices, and increasing ecological hazards to health, crops, and

livelihoods, the risk of falling into poverty still looms large over households, exposing their living conditions to insecurity and instability. According to Hardeweg et al., (2009), the vulnerable population is generally much larger than the fraction of the actually poor at a given point in time. To capture these negative welfare effects of exposures to downside risks, the concept of “vulnerability to poverty” has emerged over the past two decades as an important social indicator and/or measure of individual well being. It extends the classic concepts of (aggregate or individual) income or consumption poverty into two directions: first, by adopting a more holistic view that captures many aspects of overall well-being and, second, by a forward-looking approach, capturing the risks, shocks and dynamics of moving into and out of poverty.

1.1. PROBLEM STATEMENT

Malaysia has been recognized as one of the countries that have successfully reduced the problem of poverty among its population. In 1970, the poverty level stood at 49.3 percent of the total population. The rate was later reduced to 8.1 percent in 1999 before reaching 3.7 percent in 2011 (Department of Statistics Malaysia, 2011). Another measure of poverty, the hardcore poverty rate has also declined significantly from 1.2 percent in 2004 to 0.7 percent in 2009 (Department of Statistics Malaysia, 2011). The substantial decline in poverty incidence in Malaysia is primarily due to consistent and continuous efforts undertaken by the government in combating the problem through the implementation of various programs and measures.

However, the recent trend in the literature that moved towards the re-conceptualisation of poverty in terms of insecurity or vulnerability, have brought out another issue of how poverty should be tackled in Malaysia. Most of the poverty eradications programmes developed in this

country were based on the premises that these measures would help the poor to get out of the poverty trap. However, there are yet any measures that have been introduced in order to prevent those who are vulnerable to become poor from falling into poverty trap. Furthermore, the social security system in this country is far from adequate and does not cover all the risks that households may face. According to Ragayah et al (2002), the Malaysian social security system only covers those who are employed in the formal sector. This implies that those who are not working or those who are self-employed are not covered by any of the schemes and will have to rely on other sources when face with a shock. And even for those who are covered by the system, they are not protected against all types of risk or shocks, as the coverage of the system is very limited.

Table below list down all the different schemes of social protection in Malaysia. As can be seen, the types of protection provided by most of the schemes are related to employment, which explains why only those who are employed in the formal sector benefit from the system. And even though the government does have social assistance programs administered by the Social Welfare Department, the quantum of assistance provided is very marginal and they serve only as a partial or temporary relief for the beneficiaries. It is also argued that not all who deserve to obtain these assistances actually obtain them especially those living the remote rural areas. The latter are normally not aware of the programs and even if they are aware of the programs, they do not know how to apply for the programs. The government is aware of this problem of accessibility and has implemented several measures to tackle it such as the E-sinar program whereby it is the officers of the Welfare Department themselves who look for those who are entitled to receive assistance.

Table 1.1. Social Security System in Malaysia

No.	Schemes	Protection Provided
1	Employer's Liability Scheme	1. Employment injury (under the Workmen's Compensation Act, 1952) 2. Sickness and maternity benefits (under the Employment Act, 1955)
2	Pension scheme for civil servants	Old age, employment injury, invalidity and survivors benefits
3	Employee Provident Fund (EPF)	Old age
4	The Workers' Compensation Scheme	Employment injury
5	The Employment Injury Insurance scheme (SOCISO)	Employment injury and death
6	The Invalidity Pension scheme (SOCISO)	Invalidity and survivors benefits
7	Social Assistance (Social Welfare Department)	Old Age, Invalidity, Poverty

Source: Ragayah et al. (2002)

The lack of programs that focus on the issue of vulnerability as well as the relatively low protection provided by the social security system indicate that there is a need for a thorough study on how a better poverty eradications programs in this country should be promoted so that not only those who are poor are targeted but also those who may become poor will also benefited from them. For that purpose, we must first examine how a household may become vulnerable to poverty which in turn raises the issue of risk exposure and risk management strategies.

1.2. OBJECTIVE OF THE STUDY

- 1) To identify the main shocks/risks that are affecting the livelihood of the poor in the rural areas.
- 2) To examine the effects of these shocks/risks on the livelihood of the poor in the rural areas (on their consumption, education, health).
- 3) To identify strategies adopted by the households in coping with and in managing the shocks/risks.
- 4) To examine the effectiveness of these risk coping/management strategies.
- 5) To examine the impacts of the adoption of these strategies on their livelihood.
- 6) To identify roles that can be played by relevant authorities in complementing the strategies adopted by the households.
- 7) To develop an indicator of poverty liableness
- 8) To suggest improvements on the existing social safety nets in the country.

1.3. IMPORTANCE OF THE STUDY

Poverty is an unpleasant situation. Poverty implies having insufficient food, income and other inputs to maintain an adequate standard of living. Poverty also relates to vulnerability to shocks to the livelihood systems and inability to cope with and recover from them.

At the micro level, every household tries to escape from the poverty status. However not all household can be successful in their quest to escape from the poverty trap. At the macro level, every governments attempt to eradicate the incidence of poverty through various policies such as development projects and distributing budget and assistances to the targeted population.

However, sustainable poverty reduction programme is difficult to achieve without some kind of mechanisms that help household manage shocks. Poverty eradication programmes that do not take into account the issue of risk management will only result in temporary decrease in poverty incidence, as the root of the problem is not tackled.

In Malaysia, even though there is a relatively large body of literature on issues pertaining to poverty, the link between poverty and vulnerability as well as the issue of how exposure to risk may result in poverty have been relatively under investigated. Most if not all of the studies on poverty in Malaysia were either focused on (1) the determinants of poverty incidence, (2) the measures of poverty incidence or (3) the effectiveness (or non-effectiveness) of poverty alleviations programs. However, these studies only look at the static dimension of the issue. As discussed above, poverty is not static as households may come out and fall back into the poverty trap mainly because of their incapacity to deal with an adverse shock that affected their livelihood. Therefore, this study will bring another outlook on the issue poverty in Malaysia by looking at how households deal with adverse shock and how would this affect their livelihood.

More specifically, this study will give an idea of what types of risks faced by the rural households in Malaysia as well as the strategies that are used to cope with the risks. This

topography of risks and risk management strategies will help in the design of a social protection/insurance scheme as it provides an insight on

- i. How do Malaysian population perceive risks.
- ii. What are the risks that they are facing?
- iii. How do they react against these risks?
- iv. How effective are their strategies.

By understanding these issues, policymakers would be able to come up with measures that deals specifically with these risks and these schemes can be designed in such a way that they complement social protection mechanisms both formal and informal that are already in existence. As such policymakers could optimize the used of resources by avoiding schemes that deals with risks that are not common or risks that are already being dealt with.

In conclusion, by examining the nature of risks that are facing the poor as well as the strategies employed to manage or cope with the risks, this research will provide another dimension in understanding the problem of poverty in Malaysia. Furthermore, by understanding the ways households manage their risks and more importantly the effectiveness of such strategies, we can come up with a social insurance scheme that is designed in such a way that it can complement and enhance the effectiveness of what is already in existence.

CHAPTER TWO

LITERATURE REVIEW

Before we embarked on our analysis on the issue of risk and vulnerability within the context of rural Malaysia, it is important that we have a good understanding of what is meant by these two concepts. It is also important to understand what the meaning of risk management strategies is. Therefore, in this chapter, we will discuss in a more detail manner the concepts of risks, the vulnerabilities and risk management strategies and how the three are interrelated followed by a discussion on the empirical review of the literature on the issue.

2.1. RISK, VULNERABILITY AND RISK MANAGEMENT STRATEGIES

2.1.1. The Concept of Risk

Risk is one of the most important components in the concept of vulnerability to poverty. The term of ‘risk’ is defined as potentially dangerous event that is likely to cause a loss in individual or household welfare when it occurs and a ‘shock’ is defined as an actual occurrence of a risk. If households are defenceless, risk can easily ruin them and drive them into poverty (Chaudhuri, et al., 2002; Dercon, 2002; Harrower and Hoddinott, 2004).

Hardaker (2000) stated that, there are three common definitions of risk. First, the variability of outcomes. Second, the chance of a bad outcome and third, uncertainty of outcomes.

Holton (2004) stated that risk is exposure to a proposition of which one is uncertain. It is a condition of individuals, humans and animals that are self-aware. Organization, companies and governments are not self-aware, so they are incapable of being at risk. However, Siegel and Alwang (1999) stated that the term of “risk” refers to uncertain (i.e., stochastic) events and outcomes with known or unknown probability distributions.

Risk is characterized by some probability distribution of uncertain events. It can be featured by their correlation, frequency and timing, and severity, all of which affect the vulnerability of households. It is important to emphasize that those risks are likely to cause significant negative impacts or damage well being. Table 2.1 list the main categories of risks faced by household namely natural risks, health risks, economic risks, life-cycle risks, social risks, political risks, and environmental risks.

One way of characterizing risk is by looking at its degree of its correlation among individuals, households, communities and regions. Certain types of risks are uncorrelated among individuals and regions, and only affect specific individuals or households (e.g. family break-up, death of the household breadwinner or business failure). This type of risks is referred to as *idiosyncratic* risks.

Table 2.1. Example of Risk by Categories

Categories of risks	Examples of risk
Natural risks	e.g., heavy rainfall, landslides, volcanic eruptions, earthquakes, floods, hurricanes, droughts, strong winds, crop damage, etc.
Health risks	e.g., illness, injury, accidents, disability, epidemics (e.g., malaria), famines, etc.
Life cycle	risks e.g., birth, maternity, old-age, family break-up, death, etc.
Social risks	e.g., crime, domestic, violence, terrorism, gangs, war, social upheaval, etc.
Economic risks	e.g., unemployment, harvest failure, business failure, resettlement, output collapse, balance of payment shock, financial crisis, currency crisis, technological or trade induced terms of trade shock, etc.
Political risks	e.g., discrimination, riots, etc.
Environmental risks	e.g., pollution, deforestation, land degradation, nuclear disaster, etc.

Source: Holzmann and Jorgensen (2000)

On the other hand, there are shocks or risks that affect a group of households, an entire community (e.g., earthquakes, floods), the whole nation (e.g., economic crisis) or even several nations (e.g., a nuclear disaster, epidemic diseases) at the same time. This type of risks is termed *covariate* risks, because they are correlated among individuals and regions (that is, they affect many people simultaneously). Depending on their degree of correlation, it is possible to distinguish between regional covariate, national covariate and international covariate shocks. For example, job loss can be an idiosyncratic event affecting an individual. However, if the job loss is the result of a major macroeconomic crisis, it can be common to most workers in a specific

region, and thereby be a covariate risk. Thus, whether a shock is idiosyncratic or covariate may not be as obvious as it depends on its underlying sources and impacts (World Bank, 2000).

The severity of a shock denotes the impact it is likely to have with regard to the expected welfare loss of a household. The expected severity of a shock depends on whether a shock will lead to a catastrophic or a non-catastrophic outcome. A catastrophic outcome would be one that pushes a household below (or deeper below) the poverty line; a non-catastrophic shock would not have such consequences (Heitzmann et al., 2002).

However, the severity of a shock will depend on various factors other than the shock itself. Among others it will be function of the asset base of a household and the instruments taken or available in order for the household to respond to a risk. For example, the death of a breadwinner in one household with a high level of assets, and relevant life insurance will have different relative welfare effects as compared to another household with a low asset base, in which the dead breadwinner was the only person generating household income and had no life insurance. While one household will be experiencing a catastrophic shock, the same event will not necessarily be considered as catastrophic for the other household.

Another notion closely related to risk is vulnerability. As stated above, not all individuals will suffer from being exposed to risks. But there are also those who are more vulnerable to risks and who will have their welfare diminished because of risks. We will now discuss the concept of vulnerability

2.1.2. The Concept of Vulnerability

Vulnerability can be defined in various ways. Chaudhuri et al. (2002) define vulnerability as the probability that a household's consumption will cross the poverty line in the near future and measure vulnerability by predicting the mean and the variance of future consumption. This vulnerability may be due to lack of precautionary assets.

Holzmann (2003) stated two definitions of vulnerability. First, in the broad sense, vulnerability is considered as *the condition of being at risk of any potentially harmful event*, as such it is something that should be avoided. Second, in a narrower sense to mean *vulnerability to poverty*, i.e. the possibility of becoming or remaining materially poor in the future.

Chambers (1989) stated that vulnerability thus has two sides: an external side of risks, shocks and stress to which an individual or household is subject to; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss. Loss can take many forms - becoming or being physically weaker, economically impoverished, socially dependent, humiliated or psychological harmed.

Watts and Bohle (1993) definition of the "space of vulnerability" shows exposure (risk of exposure to hazards) as the external side of vulnerability, whilst capacity (risk of inadequate capacity to mobilize resources to deal with hazards) and potentiality (the risk of severe consequences) form a more complex understanding of the internal side of vulnerability.

Clark et al. (2000) define vulnerability “*as the risk of adverse outcomes to receptors or exposure units (human groups, ecosystems and communities) in the face of relevant changes in climate, other environmental variables and social conditions*”.

UNDP (2004) has also defined vulnerability as “*a human condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard*”.

The concept of vulnerability has been applied to a variety of levels and systems. Nations, cities, agricultural systems and organizations have been viewed through the vulnerability lens. The key point to note here is that within these systems or spaces it is individuals and households that are differentially vulnerable to hazards (Wisner, 1993). Some general principles related to vulnerability as a concept include: first, it is forward-looking and defined as the probability of experiencing a loss in the future relative to some benchmark of welfare. Second, a household can be said to be vulnerable to future loss of welfare and this vulnerability is caused by uncertain events. Third, the degree of vulnerability depends on the characteristics of the risk and the household’s ability to respond to the risk through a diversity of “consumption smoothing strategies”. Fourth, vulnerability depends on the time horizon, in that a household may be vulnerable to risks over the next month, year, etc. and responses to risk take place over time. Finally, the poor and near-poor tend to be vulnerable because of their exposure to risks and limited access to assets (broadly defined) and limited abilities to respond to risk (Alwang et al., 2001). A common thread emerges to be that vulnerability relates to a sense of insecurity, of potential harm people must feel careful of something bad may happen and spell ruin.

Dercon (2006) mentioned vulnerability as the existence and the extent of a threat of poverty and destitution; the danger that a socially unacceptable level of well being may materialize.

2.1.3. Measuring Vulnerability

Vulnerability is difficult to measure: anticipated income or consumption changes are important to individuals and households before they occur and even regardless of whether they occur at all as well as after they have occurred. The probability of falling into poverty tomorrow is impossible to measure, but one can analyse income and consumption dynamics and variability as proxies for vulnerability (World Bank, 2000).

In the area of vulnerability, Hoddinott and Quisumbing (2003) stated that individual measures of vulnerability could be classified as: first, indexes of expected poverty (VEP), i.e., the probability that the individual household will fall below the poverty line. Second, indexes of expected utility (VEU), i.e. the distance between the utility that would be achieved by receiving an appropriately chosen level of consumption with certainty and the expected utility of the household given its uncertain prospects: and third, measures of the cost, in terms of consumption, of the exposure to (uninsured) risk (VER), as inferred by the proportion of observed change in consumption attributable to past shocks.

Empirical studies have so far focused on the measurement of households' vulnerability rather than the causes of the vulnerability. Usually the factors influencing vulnerability are some set of households' characteristics, but in most studies no conceptual model of vulnerability has been proposed. However, Foster et. al (1984) stated that no consensus has yet emerged about the

appropriate way to measure vulnerability. In general there are two approaches that have been tried to assess and estimate vulnerability. The first associates vulnerability with high expected poverty, as the probability of consumption falling below a poverty threshold (Christiaensen and Boisvert, 2000; Chaudhuri, et. al. 2002), while the second with low expected utility, so called VEU (Ligon and Schechter, 2003). In addition, both of the approaches of vulnerability indicated the household consumption, which determined by individual characteristic and is expose to covariate or idiosyncratic risk factors. The idea is to construct an appropriate probability distribution of consumption (Sarris and Karfakis, 2010). Moreover, Calvo and Dercon (2005) interpreted vulnerability as *expected deprivation*, so called The Calvo-Dercon measures, depending both on the probabilities of negative future event and their severity.

Jha et al. (2012) defined vulnerability as a household's low expected utility, so called VEU, proposed by Ligon and Schechter, 2003. The VEU measure has the advantage that it enables the decomposition of estimated vulnerability into four distinct components, there are underlying poverty, aggregate shocks, idiosyncratic shocks and unexplained risk. Moreover, Vulnerability in the VEU measure is defined as the difference between the utility derived from some level of certainty-equivalent consumption and the expected utility derived from consumption. In addition, a household with very low expected consumption expenditures but with no chance of starving may will be poor, but they still might not wish to trade places with a household having a higher expected consumption but greater consumption risk. It seems desirable to have a measure of household welfare, which takes into, account both average expenditures as well as the risk households bear.

Gaiha et al., (2007) measured vulnerability of households in Vietnam and assess how it affects their poverty status over time. Using panel data based on the Vietnam Household Living Standards Survey (VHLSS) that cover the whole of Vietnam in 2002 and 2004. They used the measure of “Vulnerability as Expected Poverty” (VEP), an *ex ante* measure proposed by Chaudhuri, Jalan and Suryahadi (2002) who applied it to a large cross-section of households in Indonesia. They found that, first, in general, higher vulnerability translates into poverty over time (vulnerability in 2002 translates into poverty in 2004); second, vulnerability of the poor tends to perpetuate their poverty; third, while some manage to overcome their poverty despite being vulnerable, their prospects of doing so are less likely than of remaining in poverty; and fourth, vulnerability of the non-poor propels them into poverty.

2.1.4. Risk, Vulnerability and Poverty.

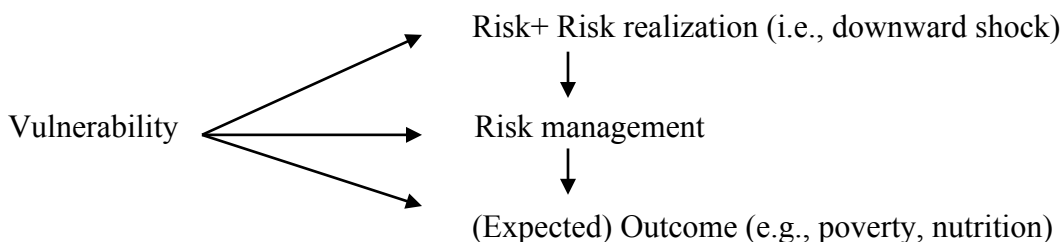
As can be seen from our discussion above, there is a close relationship between these three variables. To a certain extent, risk will lead to vulnerability, which will then result in poverty. However, whether a risk will result in more vulnerability or not will depend on the assets of households, on the risks they face, the characteristics of the risks, once they are realized, and the households’ responses to these challenges. Vulnerability also depends on the existence (or absence) of markets for assets, since they are of limited use if they cannot be efficiently mobilized to manage risks.

It is important to note that vulnerability is derived from (i) exposure to risks and shocks and (ii) an inability to manage these risks and shocks due to inadequate assets and social protection mechanisms (such as social insurance and assistance). Vulnerability reduction thus requires a

better understanding of risks and risk exposure, the outcomes that are likely to be generated by shocks, and the most efficient means and trade-offs of managing risks, which are not least contingent on a household's assets (Alwang et al., 2001).

Vulnerability of households can be decomposed into three components of a “*risk chain*”: first, the *risk*, or uncertain events, second, the options for managing risk, or the *risk responses*, and third, the *outcome* in terms of welfare loss. Figures 2.1 illustrate the risk chain.

Figure 2.1. The “Risk Chain”, The Relationship between Risk and Vulnerability



Source: Heitzmann et al. (2002)

According to the risk chain, vulnerability begins with a notion of *risk*. However, when faced with a risk, households can *respond to*, or manage, risks in several ways. Households use formal and informal risk management instruments depending on their access to these instruments. Risk management involves *ex ante and ex post* actions. *Ex ante* actions are taken before a risky event takes place, and *ex post* management takes place after its realization. *Ex ante* risk reduction can reduce risk (e.g., eradication of malaria-bearing mosquitos) or lower exposure to risks (e.g.,

malaria pills, mosquito nets). It is also possible for a household to take ex ante risk mitigation actions that provide for compensation in the case of loss such as purchase of insurance. Risk mitigation includes formal and informal responses to expected losses such as self- insurance (e.g., precautionary savings), building social networks, and formal insurance based on expansion of the risk pool. Ex post risk coping activities are responses that take place after a risky event is realized and involve activities to deal with realized losses such as selling assets, removing children from school, migration of selected family members, seeking temporary employment. Some governments provide formal safety nets; such as public works programs and food aid that help households cope with risk.

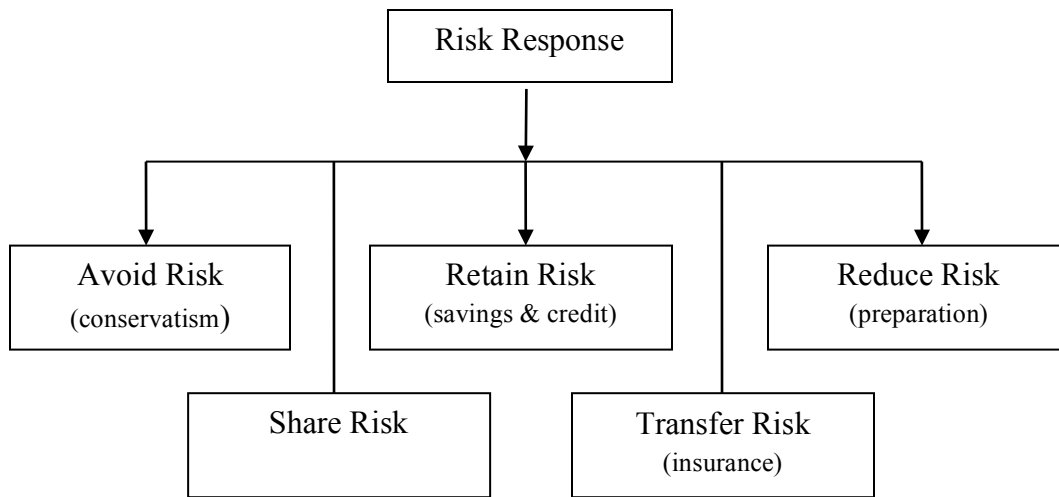
Finally, risk when combined with the household responses will lead to the *outcome* of this exposure to risk. A household is said to be *vulnerable from* the risk or *vulnerable to* an outcome. The outcome is the change in welfare that results from the realization of risk, the shock and from the success or failure of the risk management instruments applied. A household might be able to mitigate or cope with a risk or set of risks in a given period (e.g., a seasonal decline in income), but the process can result in limited ability to manage risk in subsequent periods, especially when assets are degraded. However, vulnerability is the continuous forward-looking state of expected outcomes, which are in themselves determined by the correlation, frequency and timing of realized risks and the risk responses. Households are *vulnerable* if a shock is likely to push them below (or deeper below) a predefined welfare threshold (e.g., poverty). Thus, both poor and non-poor households might be vulnerable at a given point in time.

Our discussion above has shown that risk management is an important determinant in the relationship among risk, vulnerability and poverty. We will now examine the concepts of risk management.

2.1.5. Risk Management Strategies

Risk management, or risk response, comprises all actions taken to respond to risks, shocks and adverse outcomes generated. Siegel and Alwang (1999) stated that household risk management refers to the set of mechanisms used by households to deal with anticipated or actual losses associated with uncertain events and outcomes. These mechanisms are employed depending on beliefs about the probability of events' occurrence and anticipated impacts on household welfare. Risk management can affect households through changes in income and consumption, in investment patterns, and in livelihood. All of these are influenced by, and influence, the asset base. Dynamic impacts of risk are reflected through investment patterns and impacts on the asset base. McCord (2001) categorizes risk management or risk response into five main categories as shown in Figure 2.2.

Figure 2.2. Risk Response Options



Source: McCord (2001)

The three boxes on the upper row of the risk responses, avoid risk, retain risk and reduce risk all represent strategies that provide the poor with something to fall back on when faced with a risk event. In the context of *risk reduction*, the range of actions that the poor take is varied. It may include, for example, diversifying income sources; building up assets by saving, stocking food, and investing housing and health care. It might also include strengthening social networks and participating in reciprocal borrowing and lending systems. Another *risk reduction* strategy is to manage money well by controlling consumption, budgeting income and expenditures, and maintaining access to multiple sources of credit. Participation in funeral societies and other informal insurance systems are forms of *risk sharing* while formal insurance programmes, pension schemes, or other formal social security systems involve *risk transfer*.

After a shock or economic stress event hits, individuals and households use various strategies for coping with the loss. They include *sharing risk* (receive support from informal groups or

informal insurance systems), *transferring risk* (receive support from formal insurance systems) or *risk retention* which includes a range of individual mechanisms such as modifying consumption, raising income by mobilising labour, selling assets, using savings; borrowing; receiving help from individuals.

Another way of categorizing risk management is by looking at its temporal dimension. Risk management can be applied before a risk materializes (*ex ante* risk management), or after it has been materialized (*ex post* risk management). Table 2.2 shows the risk management into *ex-ante* and *ex-post* strategies. Both *ex ante* strategies (precautionary) and *ex post* strategies (managing a loss) for dealing with risk involves a mix of intra-household measures (self-insurance) and inter-household, group-based measures (informal and formal insurance). The types and mix of *ex ante* and *ex post* strategies that an individual or household use at a given time reflects its level of vulnerability or economic status (Cohen and Sebstad, 2003).

Table 2.2. Risk management strategies: targets and important points

Ex ante risk management, i.e., actions taken before the risk is realized.	
i.	Risk prevention or reduction - Prevents or reduces risk
ii.	Lowering risk exposure - Lowers exposure to risk
iii.	Risk mitigation - Provides compensation against the expected loss
Ex post risk management, i.e., actions taken after the risk is realized.	
i.	Risk coping - Copes with the realized losses caused by shocks

Source: Heitzmann et al. (2002)

i. Ex-ante Risk Management Strategies (Income smoothing Strategies)

The goal of *ex-ante* measures is to prevent the risk from occurring, or, if this cannot be done, to mitigate the effects of the risk. Individual efforts such as migration can prevent risks, but in many cases, this requires support from the government (for example, disaster prevention). Mitigating the effects of risk through risk pooling by definition requires people to interact with other individuals and poor people are typically less able to participate in formal and also informal arrangements. This leaves most poor households with the residual option of coping with the risk once it has occurred. They are normally poorly prepared to do this and therefore, often experience irreversible negative effects (Holzmann et al., 2003).

Ex ante risk management consists of three types of strategies:

- a. Risk Prevention or Reduction. These are actions taken to eliminate or reduce risky events from occurring;
- b. Prevention or Reduction of Exposure to Risk. Given the existence of risks, these are actions taken to prevent or reduce exposure to such risks and
- c. Risk Mitigation. These are actions that can be taken *ex ante* to provide compensation in the case of a risk-generated loss (e.g., social contracts, holding of savings, purchase of insurance). In addition, risk mitigation strategies help individuals to reduce the impact of a future risk event through pooling over assets, individuals and over time (e.g., health insurance) could provide compensation for the expected welfare losses, For example, a household could purchase health insurance that would cover various health-related costs such as medicines.

Morduch (2005) emphasized that, in addition to *ex-post* coping strategies, the rural poor may make considerable efforts to smooth income *ex ante* by opting for economic activities (mainly production and employment) with possibly lower but safer returns, thereby forgoing economic activities with potentially higher but possibly more volatile expected returns. Bliss and Stern (1982) found that in northern Indian farmers were similarly found to underuse fertilizer in order to cut investment losses in the event of bad weather. However, poor households are often faced with significant entry barriers to income diversification involving relatively more profitable non-farm activities since these often require substantial amount of initial capital or education. Such entry barriers for activities with higher expected returns might be one reason for the possible unwillingness or inability of the poor to accept lower average incomes in exchange for smoother income flows.

ii. Ex-post Risk Management Strategies (Risk coping / How the Poor Smooth Consumption)

Ex post risk coping are actions or responses that are taken *after* a risk has been realized. Risk coping involves activities to deal with realized (or actual) losses, such as the selling of assets, seeking “emergency” loans (from relatives, friends, banks), removing children from school, migration, seeking temporary employment. To help some individuals and households cope, governments sometimes provide formal safety nets such as public works programs, food aid and other types of transfers.

In addition, *Ex-post* coping strategies can be further categorized into savings or asset holdings, reallocation of household resources (most notably, household labour force including children), and informal risk-sharing institutions (Balisacan and Fuwa, 2007):

- a. *Savings/Asset Holdings*: One way of smoothing consumption, in the face of fluctuating incomes, is to hold assets (as precautionary savings), to liquidate/deplete them when hit by a negative income shock, and to accumulate in the face of a positive shock. Given the general absence of financial assets (e.g., bank deposit), asset items for consumption smoothing can take a wide variety of forms including jewellery, animals, crop inventory, or land. Using the ICRISAT-VLS data, Rosenzweig and Wolpin (1993) shown that holding of bullocks appears to serve as a consumption-smoothing measure, while Townsend (1995) found in the same data set that crop inventory, rather than bullock holding, is the main means of consumption smoothing. Fafchamps et al. (1998), based on African example, also found evidence that asset holding is not the main consumption-smoothing mechanism. On the other hand, using Thai data, Paxson (1992) found that transitory incomes due to rainfall fluctuations are mostly saved rather than consumed, consistent with consumption-smoothing behaviour based on the permanent income hypothesis (PIH). However, the effectiveness of holding assets as a consumption-smoothing strategy can be limited for various reasons, the returns on assets can fluctuate due to macroeconomic shocks (introducing its own risk element), and, in addition, when a covariate shock hits (such as drought), the terms of trade between the asset and food can collapse when everyone wants to sell assets (e.g., animals) and buy food which is in short supply. In addition, the sale of productive assets (such as land and draft animals) for consumption-smoothing purposes will reduce the asset base for future income flows (Besley, 1995; Dercon, 2005).

- b. *Reallocation of Household Resources:* Households when face of shocks, can also reallocate their resources to cope with income fluctuations by reduction of consumption (e.g., cutting down on the consumption of non-essential or luxury goods) or a reallocation of household labour force. Based on ICRISAT-VLS example, when a crop fails (and local labour markets are reasonably well-functioning), the farm households could increase labour wage incomes to compensate for the lost farm income (Kochar, 1995). Based on a Korean example, Kang and Sawada (2003) found that Korean consumers responded to the income shock (a 24 per cent reduction on the average) mainly by reducing consumption of luxury items, such as leisure activities, dining out and purchase of durable goods, while maintaining the expenditures for food, education and health. A study on Indonesia example, Thomas et al. (2004) found that in the face of the income shock (a 15 per cent decline in per capita consumption), households reduced non-food consumption while maintaining the share of food consumption; also, both school enrolment and the share of the education budget decreased among younger children (aged 10-14), while the schooling of older children was shielded from such reductions in poor households but not in better-off households.
- c. *Informal Risk-Sharing Arrangement/Institutions:* informal institutions include credit cooperatives, informal credit and insurance arrangements (including state-contingent credit), rotating savings and credit associations, interlinked agricultural contracts, and inter-household transfers through gifts, combined with strategic decisions on marriages, etc. A study of Udry (1994) found in northern Nigeria, the state-contingent credit functioning as an insurance mechanism to smooth consumption, due to a wide

variety of idiosyncratic production and consumption shocks (such as flooding, wind or rain damage, insect infestation, illness). In addition, Fafchamps and Lund (2003) found that in northern Philippines, consumption smoothing is attempted through gifts and informal loans (mostly with zero interest) among relatively small networks of friends and relatives, rather than through livestock or grain stocks, and village-level risk sharing is incomplete. In addition, such network risk sharing appears capable of insuring only against specific types of risks (i.e., major life-crisis rituals like funerals and unemployment of the household head) but not other risks. In northern Thailand, a wide range of risk-coping mechanisms has been observed, including buffer stocks, labour supply, and village-level institutions, which provide credit, rice, and health insurance funds. The pattern is not uniform and substantial variations are observed across villages (Townsend, 1995). Besides that, savings, credit and insurance arrangements help with risk management in a variety of ways. First, households can use precautionary savings or consumption credit to smooth consumption in the face of either income shocks or anticipated variation in income (e.g., due to seasonality) or in expenditures (e.g., due to dowries or costs associated with weddings or other predictable ceremonies). Second, households can use production or investment credit to build up assets and thereby increase their future capacity to self-insure (Bhattamishra and Barrett, 2009).

Another categorization of risk coping mechanisms are provided by Holzmann (2001) who stated that the main coping strategies that households use when faced with a particular shock are:

- a. *Self-help or self-insurance*: These strategies involve selling, pledging, or mortgaging their assets, using their assets to generate more income, or supplying more work or augmenting the labour supply of those already employed.
- b. *Informal insurance*: This consists of households borrowing from friends, relatives, or moneylenders, or from the workplace or receiving help from friends, relatives, or neighbours; or using other social capital networks.
- c. *Market insurance or use of credit*: This involves the household using market-based mechanisms, such as credit (borrowed from banks, sold harvest in advance) and private insurance (cashed in the insurance premium).
- d. *Government help*: Some households' main coping strategy was to rely on government help in the form of disaster relief, aid, or social assistance services.
- e. *Help from NGOs or other private or international organizations*: When faced by a shock, some households received helps in the form of cash or in kind from local or international NGOs.

2.1.6. Social Risk Management

Holzmann and Jorgensen (1999) use the term “social risk management (SRM)” to refer to the social management of risks, how society manages risks (not how to manage social risks). SRM includes the broad range of formal and informal proactive and reactive risk management strategies used by individuals, communities, nations and communities of nations, including actions by the public, private, and informal sectors. From a SRM perspective, social protection addresses the issue of how vulnerable households can be helped to better manage risks and become less susceptible to damaging welfare losses.

The social risk management arrangements have developed into three main categories: first: informal arrangements, second: market-based arrangements, and third: public arrangements. Each of them has relative strengths and limitations.

- i. Informal Arrangements:* These arrangements have existed since the dawn of mankind and still constitute the main source of risk management for the majority of the world's population. In the absence of market institutions and public provisions, the way that individual households respond to risk is to protect themselves through informal (family or community) or personal arrangements (self-protection and self-insurance). Although they sidestep most of the information and coordination problems that cause market failure, they may not be very effective in helping the household weather adverse events. Examples of this kind of arrangement include: the buying and selling of real assets (such as cattle, real estate, and gold), informal borrowing and lending, crop and field diversification, the use of safer production technologies, storing goods for future consumption, mutual community support arrangements, and kinship arrangements through marriage.
- ii. Market-based Arrangements:* Individual households will also take advantage of market-based institutions such as money, banks, and insurance companies when they are available. However, in view of these instruments' limitations due to market failure, their usage will be initially restricted but will rise with financial market development. Because formal market institutions are reluctant to lend to households

without secured earnings, microfinance is also an important instrument of social risk management.

iii. Public Arrangements: Public arrangements for dealing with risk came into being with the development of the modern welfare state but are relatively scarce and have very limited coverage in the developing world for fiscal and other reasons. When informal or market based risk management arrangements do not exist, break down, or are dysfunctional, the government can provide or mandate (social) insurance programs for risks such as unemployment, old-age, work injury, disability, widowhood, and sickness. The mandatory participation in a risk pool can circumvent issues of adverse selection, in which individuals with low risk profiles avoid participation in insurance pools due to premiums while individuals with high risk profiles join in order to gain access to pay-outs. Since these programs typically apply to those in formal employment, their coverage in developing countries is generally low. On the other hand, governments have a whole array of instruments to help households to cope after a shock hits. These include social assistance, subsidies on basic goods and services, and public works programs.

Table 2.3 illustrates strategies and arrangements of Social Risk Management.

Table 2.3. Strategies and Arrangements of Social Risk Management

Arrangements/ Strategies	Informal	Market-based	Public
Risk Reduction			
	<ul style="list-style-type: none"> • Less risky production • Migration • Proper feeding and weaning practices • Engaging in hygiene and other disease preventing activities 	<ul style="list-style-type: none"> • In-service training • Financial market literacy • Company-based and market-driven labour standards 	<ul style="list-style-type: none"> • Labour standards • Pre-service training • Labour market policies • Child labour reduction Interventions • Disability policies • Good macroeconomic policies • AIDS and other Disease prevention
Risk Mitigation			
Portfolio	<ul style="list-style-type: none"> • Multiple jobs • Investment in human, physical and real assets • Investment in social capital (rituals, reciprocal gift-giving) 	<ul style="list-style-type: none"> • Investment in multiple financial assets • Microfinance 	<ul style="list-style-type: none"> • Multi-pillar pension systems • Asset transfers • Protection of property rights (especially for women) • Support for extending financial markets to the poor
Insurance	<ul style="list-style-type: none"> • Marriage/family • Community arrangements • Share tenancy • Tied Labour 	<ul style="list-style-type: none"> • Old-age annuities • Disability, accident and other personal insurance • Crop, fire and other damage insurance 	<ul style="list-style-type: none"> • Mandated/provided insurance for unemployment, old-age, disability, survivorship sickness, etc.
Risk Coping			
	<ul style="list-style-type: none"> • Selling of real assets • Reduced savings or investment • Borrowing from neighbours • Intra-community transfers/charity • Sending children to work • Dis-saving in human capital • Migration 	<ul style="list-style-type: none"> • Selling of financial assets • Borrowing from banks 	<ul style="list-style-type: none"> • Transfers/Social assistance • Subsidies • Public works

Source: Holzmann (2001)

2.2. EMPIRICAL LITERATURES ON VULNERABILITY

Vulnerability to risk is a dominant feature of the poor's livelihood. This is particularly true for small farmers in developing countries. Shocks affect welfare through the shocks it induces on income, assets, and health. For many poor farmers in developing countries, risk remains a serious cause of poverty and ruin and in still too many instances a matter of life and death. Households' desire to protect themselves against shocks is thought to affect their production and savings decisions (Fafchamps, 2009). And some theoretical literature suggests that vulnerability of a household depends on its ability to smooth consumption in the face of various income shocks.

Makoka (2007) studied a functional risk and vulnerability assessment at household level. He employed econometric techniques and adopted by using a two-period cross sectional data associated with rainfall data. He expected that have a better understanding of the role of risk in influencing vulnerability to poverty among households in Malawi.

Sricharoen (2011) studied the risk and vulnerability to poverty of rural farm household in Northeastern of Thailand. Specific random sampling technique is used in the selection of 415 households, divided into 23 districts in Buriram province. She employed feasible generalized least squares (FGLS) method to estimate vulnerability to poverty. The results indicated that two groups of vulnerable household, which are high and low vulnerable households, and about 44.34% of households are vulnerable to poverty. The comparison of observed poverty status based on vulnerability index present that 75.2% of farm households are poor, whereas another 24.8% are non-poor. Moreover, the result headcount ratio in terms of household expected consumption less than poverty line is relatively high at 65.8%.

Sarris and Karfakis (2010) presented a method to quantitatively assess the nature and the extent of vulnerability to idiosyncratic and covariate uncertain shocks among rural, especially poor rural households and also to indicate a method that can be utilised to define observable indicators that can be utilized for targeting assistance to most vulnerable households subject to consumption shocks. The analysis based on a representative survey of 957 rural households in 45 villages in the Kilimanjaro region and a representative survey of 892 rural households in 36 villages in the Ruvuma region in rural Tanzania. They estimated vulnerability as the probability of consumption falling below a poverty line by employed Feasible Generalized Least Squares (FGLS) procedures and using Ordinary Least Squares (OLS) regression. The result found that vulnerability is quite high in the rural regions of Tanzania and considerably higher in the region which is regarded as generally poorer, namely Ruvuma and the proportion of the consumption variability that is due to covariate shocks is much smaller in the Kilimanjaro region, compared to the poorer Ruvuma region, where it includes the amount of consumption variability. Moreover, among different types of rural households those that are cashew nut producers appear to be much more vulnerable compared to coffee and tobacco producing households.

Jha et al. (2012) investigated household vulnerability, household's risk coping strategy and the effect of the strategy on household consumption in rural India. They estimated household vulnerability by using Vulnerability as Expected Utility (VEU) analysis and household response to risk (choice of coping strategy) using multivariate probit estimation. The results demonstrated that in rural India household vulnerability is mostly explained by poverty and idiosyncratic components and risk coping strategies of households rely heavily on informal instruments such as their own saving, transfers or capital depletion. They also try to cope with covariate risks by

participating in government programmes. In addition, household consumption is highly covariate with income. This implies that existing informal insurance instruments are not sufficient to protect household consumption against income shocks. However, government sponsored coping strategies reduce the idiosyncratic and risk component of vulnerability.

Balisacan and Fuwa (2007) studied the nature and causes of poverty and vulnerability, also the policy lessons emerging from the rapidly expanding literature on growth, poverty, vulnerability and inequality in rural Asia. The results suggested that the pace of poverty reduction is dependent on factors such as the level of initial income inequality; the access of the rural population to infrastructure, human capital and various markets (e.g., credit, land), the quality of institutions and government policies. Moreover, the micro-level data, the relative importance of alternative risk-coping mechanisms (e.g., income versus consumption smoothing, alternative types of asset holdings, etc.), the risk-coping mechanisms can insulate household consumption from income fluctuations incompletely and poorer households tend to be less able to insure themselves than better-off households.

Imai et al. (2010) analysed poverty dynamics and vulnerability in Vietnam. Using data from the 2002 and 2004 Vietnam Household Living Standards Survey (VHLSS) for the whole of Vietnam, they compare poverty and vulnerability measures. They employ the headcount ratio (based on the national poverty line) in a given year as an indicator for poverty and measure vulnerability by the probability of next year's consumption being below the poverty line, presupposing that consumption is log-normally distributed. They found that households in areas of high and low mountains are considerably poorer (with 2004 poverty rates being 0.27 in low

mountains and 0.45 in high mountains) than in other areas (coastal area, inland delta and hills) of Vietnam with respective poverty rates of 0.23, 0.18 and 0.19. Vulnerability is pretty low (between 0.01 and 0.04) in all regions except for the high-mountain areas (0.32).

Fisher and Buchenrieder (2010) investigated the theoretical links between poverty, vulnerability and risk, in order to better understand the highly diverse livelihood strategies of vulnerable rural farm households in Vietnam. Quantitative and qualitative studies took place in ten villages, in Ba Be and Pac Nam districts in Bac Kan province, as well as in Yen Chau district in Son La province (2004-2005). At the village level, general household interviews with a structured questionnaire were conducted among 203 households with 670 adult household members. Their result suggested that limit endowment with and access to capital assets and service institutions, as well as human and economic risks are the main components affecting rural livelihoods. Constrained access to adequate risk management strategies increase household's vulnerability, drowning them more and more in poverty.

Tesliuc and Lindert (2004) studied risk and vulnerability assessment in Guatemala. This study combines quantitative data from the Living Standards Measurement Study and qualitative information from an in-depth qualitative study of poverty and exclusion conducted in 10 villages in Guatemala. Both data sources were designed to capture issues related to vulnerability, risks, and risk management. They employ a multivariate logistic model to examine the association between a household's characteristics and location and the probability that it reports a shock or incurs wealth and income losses due to the shock and the probability that it has recovered from the negative impact of the shock by the time of the interview. Moreover, multiple regression

analysis to estimate the cost of shocks and vulnerability to consumption poverty. The result shown that: first, the poor in Guatemala are disproportionately more exposed to natural disasters and agricultural related shocks and less to economic shocks specific to formal economy (in which they do not participate) than the non-poor, second, in years with moderate shocks, most households are able to smooth their consumption, using a wide range of risk management instruments and arrangements (the poor mainly through self-help and informal means, the non-poor through self-help and market-based mechanisms). The qualitative survey revealed that catastrophic shocks (natural disasters such as Hurricane Mitch or the 1976 earthquake or armed violence before the Peace Accords) have long-lasting negative effects on the welfare of the poor and third, most households that are vulnerable to consumption poverty are “chronically” vulnerable, which means that government need to concentrate on building the assets of the poor.

However, Klasen et al. (2011) studied whether different types of female headed households in Thailand and Vietnam are worse off compared to households headed by men in terms of: first, consumption, second, the likelihood to experience a shock, third, shock severity, fourth, consumption smoothing, as well as fifth, vulnerability to poverty and sixth, perceived vulnerability to downside risk. Using a unique panel dataset of over 4000 from six rural provinces households from both countries, Thailand and Vietnam (Buriram, Ubon Rachathani and Nakhon Phanom and the Vietnamese provinces of Ha Tinh, Thua Thien-Hue and Dak Lak). They employed Ordinary Least Squares regression, the results shown that female-headed households are somewhat better off in terms of current consumption in both countries. In addition, there is very little evidence that female-headed households are more prone to shocks, less able to smooth their consumption or more vulnerable than male-headed households.

2.3. EMPIRICAL STUDIES ON RISK MANAGEMENT STRATEGIES

2.3.1 Effective Risk Management Strategies

Households do not just undergo the consequences of high risk. Livelihood systems have developed that focus on long-term survival and well-being. There are different ways to characterize these systems. Alderman and Paxson (1994) distinguish risk management from risk-coping strategies. The former attempt to affect ex-ante the riskiness of the income process ('income smoothing'). Examples are income diversification, through combining activities with low positive covariance and income-skewing, i.e. taking up low risk activities even at the cost of low return. In practice, this implies that households are usually involved in a variety of activities, including farm and off-farm activities, use seasonal migration to diversify, etc. (Morduch, 1990). They are usually household or individually based but may also involve neighbours, relatives or kingroups (Fafchamps, 1992). The experiences during the large famines in the Horn in the mid-1980s also illustrated the limitations of these coping strategies. Rahmato (1991) has documented in detail the complexity of these strategies, but the results were still dramatic. Reardon et al. (1988) reported that a transfer in the aftermath of the 1984 drought was only equivalent to 3 percent of the losses for the poorest households in the Sahel. Recent events in East Asia during the recent crisis also exposed the limitations of informal insurance and self-insurance. Large increases in consumption poverty have been reported, especially for rural households in remote areas or those dependent on transfers from urban areas, households relying on seasonal migration and those households who also experienced the El-Niño (climate pattern) related drought in the same period.

Many studies have found that poor households' ability to cope with shock or risk is determined by their assets (Alwang et al., 2001). One way of smoothing consumption in the face of fluctuating incomes is to hold assets and to liquidate them when shocks occur. Asset items for consumption smoothing can take a wide variety of forms including jewellery, animals, crop inventory, or land (Balisacan and Fuwa, 2007).

Using the ICRISAT-VLS data, Rosenzweig and Wolpin (1993) found that in rural India, due to the lack of credit and leasing markets, some rural households purchase bullocks, important tools of traction, and sell them to acquire enough cash in the dry season to smooth households' consumption. Another of the most commonly used instruments to smooth consumption upon occurrence of a shock is temporary wage income employment. Takasaki et al (2001) show that households in the Amazonian tropical forest cope with both idiosyncratic and systemic shocks through labour supply, in the form of upland cropping and resource extraction. Kochar (1995) reports increased labour supply as the key response in the ICRISAT villages. The literature on coping strategies when famine strikes also regularly report attempts to earn additional income through a reallocation of labour, including temporary migration, earning income from collecting wild foods (also for own consumption), gathering activities (such as increased firewood collection).

Seyi Olalekan et al. (2011) examined types of shocks the rural households experienced and shocks coping strategies applied by households. The study was carried out in Ogo-Oluwa Local Government Area of Oyo state, Nigeria. They employed a multistage random sampling technique in selecting the respondents for the study, two villages were chosen and ten

households' heads were purposively selected from the chosen villages to arrive at a total sample of 80 respondents. Moreover, probit regression model were used to analyse the data. The results revealed that the major shocks experienced by most rural household heads is more of ecological shocks in form of incidence of crop pests and livestock diseases, drought and degraded land which are common to agricultural production; these shocks significantly affect household heads with poor educational status and per capita income which is reflected in their capability and possibility to take a coping action. Most of the rural household heads usually cope with shocks through several coping strategies such as borrowing, distress sales of assets, remittances, adjustment in food intake, drawing on savings among others. Older people adopt coping strategies especially in the areas of remittance, borrowing and sales of valuable assets while few younger ones take to participation in off-farm and non-farm activities and migration in search of green pasture.

Lybbert and Carter (2009) studied whether consumption shocks can explain livestock sales, using data from rural Burkina Faso collected from 1981 to 1985 by the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT). The results are consistent with asset smoothing in the face of dynamic asset thresholds. They found that households below their estimated threshold choose to endure greater relative consumption volatility in order to preserve their livestock holdings, while those above the threshold actively buffer consumption shocks with livestock sales. Rosenzweig and Wolpin (1993) reported the use of bullocks in India to smooth consumption. Czukas et al. (1998), however, found little evidence of smoothing through sales of livestock.

Jalan and Ravallion (2001) studied behavioural responses to risks by rural households in China using panel data from 1985-1990. They found that Chinese rural households employ mainly precautionary savings against potential risk. Deaton (1991) has shown that precautionary savings can provide quite an effective, even though imperfect strategy for households in dealing with income risk. Tai et al. (2010) studied the effectiveness of risk management strategies of rural household in western China. They presented new model based on qualitative data analysis and test it using quantitative data. They found that the sale of physical assets couldn't become a coping strategy when risk hits and the effectiveness of holding assets as a consumption smoothing strategy can be limited for various reasons, as the returns on assets can fluctuate due to macroeconomic shocks. Moreover, they concluded that income diversification, precautionary financial saving and informal social supports are major risk management strategies that can be effective in reducing vulnerability and risk management strategies included self-insurance (such as precautionary assets and income diversification) and risk-sharing (such as informal support, market and community organization) instruments which associated household's assets and income diversification and a risk-sharing strategy.

2.3.2. Non-effective Risk Management Strategies

Many studies have reported high income variability related to risks of various forms. Income risk is caused by a variety of factors. Typically, common (aggregate, economy-wide, and covariate) risk is distinguished from individual (idiosyncratic) risk: the former affects everybody in a particular community or region; the latter only affects a particular individual in this community. In practice, even within well-defined rural communities, few risks are purely idiosyncratic or common. Townsend (1995) noted that income variability remains high in the ICRISAT data for

India: diversification and other income strategies are only used to a limited extent and in any case insufficient. Using the 10 years panel data for one of three ICRISAT villages in India, Townsend (1994) reported high yearly fluctuations yields (in monetary terms) per unit of land for the dominant crops. The coefficient of variation for castor was found to be 1.01, for paddy 0.70 and for a sorghum/millet/pea intercrop 0.51. Kinsey et al. (1998) reported a high frequency of harvest failures in a 23-year panel of rural households in a resettlement area in Zimbabwe. Bliss and Stern (1982) provided an estimate for Palanpur, India: if the onset of production is delayed by two weeks, then yields decline by 20 percent. Other characteristics of income risk include the frequency of shocks and the repeated nature. Relatively small but frequent shocks are more easily to deal with than large, infrequent negative shocks. Examples of the latter are disability or chronic illness; the former are events such as transient illness. Gertler and Gruber (1997) found that, in terms of consumption levels, households in their sample from Indonesia can only protect 30 percent of the low-frequency health shocks with serious long term effects, but about 70 percent of the high-frequency smaller health shocks.

If shocks come together, then coping is more difficult. Theoretically, the effects of autocorrelation on buffer stock behaviour are explored by Deaton (1991). Using panel data from Pakistan, Alderman (1998) found that with successive shocks, consumption smoothing is more difficult than with a single shock. The nature of the shock is important to understand the possibilities to deal with its consequences. Idiosyncratic shocks can be insured within a community, but common shocks cannot: if everybody is affected, the risk cannot be shared. Formal or informal insurance transfers (credit or insurance) from outside the community are

necessary; intertemporal transfers (e.g. depletion of individual or community-level savings) are also possible.

Risk-coping strategies also involve self-insurance (through precautionary savings) and informal group-based risk sharing. They deal with the consequences (ex-post) of income risk (consumption smoothing). Households can insure themselves, by building up assets in “good” years, to deplete these stocks in “bad” years. Alternatively, informal arrangements can develop between members of a group or village to support each other in case of hardship. These mechanisms are often observed operating within extended families, ethnic groups, neighbourhood groups and professional networks. In recent years, these mechanisms have been studied theoretically and empirically in variety of settings (even though mainly in a few villages in India) (Coate and Ravallion, 1993; Townsend, 1994; Lund and Fafchamps, 1997). Risk-coping strategies may also involve attempting to earn extra income when hardship occurs.

Another type of insurance against risk is group-based insurance mechanisms, which are geared towards insuring idiosyncratic shocks, affecting some members but not to all. They obviously cannot provide insurance to deal with shocks common to all members. Self-insurance can, in principal, deal with any type of shock, as long as ex-ante sufficiently large resources have been built up. Risk coping strategies are also typically insufficient. Empirical research has consistently found that households in poor developing areas have the ability to protect their consumption against a substantial fraction of income risks, but that full insurance is rarely achieved (Kazianga and Udry 2006). Work on India estimates that transfers amount to less than 10 percent of the typical income shocks (Rosenzweig, 1988). Townsend (1994) reported strong evidence of

insurance (risk-sharing) in the ICRISAT villages, even though it is still only partial insurance, not full insurance. Other studies also suggested imperfect risk sharing or consumption smoothing.

Dercon (2002) studied the strategies households and individuals use to avoid consumption shortfalls caused by risk. He suggested that the different strategies households use to cope with this risk; there are income-based strategies, assets as self-insurance and informal insurance arrangements. Households are constrained in using these strategies. Income-based strategies are limited because of entry-constraints into profitable activities, leaving the poor to concentrate on low return, low risk activities. Self-insurance is limited by access to assets and poor functioning of asset markets when a crisis hits the household. Informal insurance arrangements are affected by sustainability constraints, often excluding the poor from these arrangements; furthermore, economy-wide shocks cannot be handled by these arrangements.

Rampini and Viswanathan (2009) for example evidence on U.S. households which suggests that poor (and financially constrained) households are less well insured against many types of risks, such as health risks or flood risks, than richer (and less financially constrained) households. In addition, a similar positive relation between income and risk management has recently been documented for farmers in developing economies, there is evidence that firms' financial constraints affect corporate risk management. Risk management would require households to make promises to pay in high income states in the future, but this would reduce households' ability to promise to pay in high income states to finance durable goods (that is housing) purchases today, because households' total promises are limited by collateral constraints.

Durable goods price risk affects households in two ways. First, the price of durable goods that households own has a direct effect on households' net worth. In addition, the price of durable goods has an indirect effect because it affects households' consumption opportunities going forward. This second effect in fact can mitigate households' hedging demand, that is, may further reduce the need for household risk management. The economic intuition is straightforward. When housing prices are low, housing is cheap, which in turn may reduce the need for net worth. Moreover, Eislefeldt and Rampini (2009) mentioned that sufficiently constrained households choose to rent, which affects their risk management or portfolio choice. Because renting housing is costly, households will continue to have a strong incentive to own housing and hence face considerable financing needs for housing.

Likewise, Kurosaki (2004) investigates the inability of rural dwellers to cope with negative income shocks. His study employed a panel dataset composed from household surveys implemented in 1996 and 1999 in three villages in the Peshawar District, NWFP (North-West Frontier Province), Pakistan, an area with high incidence of income poverty and low human development. The analysis uses qualitative information on subjective risk to approximate a linear function of households' attributes, and control for the endogeneity of observed changes in income. He found that the ability to cope with negative income shocks is lower for households that are aged, landless and do not receive remittances regularly. In the sense that once hit by an income decline with a certain size these households had to reduce their consumption more, they were more defenceless and insecure.

De Mey et al. (2012) studied concepts of operational, financial, total farm and household risk, using Belgian FADN data for the period 2005-2008. Further, using a stochastic simulation model on two typical Belgian dairy farms. The result showed that price, production and financial farm risks may have substantial adverse effects on household incomes, which farmers may not be aware.

Cole et al. (2012) studies an innovative financial contract designed to insure rural Indian households against a key exogenous source of income risk: rainfall variation during the monsoon season. The sample of study are households in the Mahbubnagar and Anantapur districts of Andhra Pradesh, and the Ahmedabad, Anand, and Patan districts of Gujarat. In Andhra Pradesh based on a survey of 1,047 landowner households in 37 villages and In Gujarat, survey data are drawn from 100 villages. Households in the area of study against their most important source of income risk. The estimated show that insurance demand is significantly price sensitive, with an elasticity of around unity. Price reductions generated through greater efficiency or competition, or subsidies, would significantly increase take-up, but would not be sufficient to generate widespread diffusion of the risk management product, at least in the short run. Indeed, many farmers do not purchase insurance even when premiums are set significantly below estimated expected payouts. Furthermore, even insurance adopters generally purchase only a single policy, sufficient to cover only a small fraction of mean agricultural income.

Shiller (2007) stated that individuals generally do not solve individual risk management problems but instead are focused problems for their family, including people involved in their broader social purpose. A problem is that the family but including other non-related people that

the individual values as well as family is not a well-defined unit. It depends on psychological bonds that are hard to observe and which change through time. He examined the kinds of psychological and family problems that inhibit the proper management of household risks and some of the relevant lessons from behavioural-finance. He suggested that some of the most important achievable advances in human welfare could come about by financial innovation related to household risk management and the underlying utility maximization problem that households face is extraordinarily complex, and involves risks that evolve over long distances into the future, routinely decades or even a century or more into the future.

2.3.3. Risk to Poverty

The issue of contribution of risk to poverty has been increasingly analysed in the literature on poverty. According to these studies, there are a number of ways how risks can contribute to poverty. Firstly, risks may blunt the adoption of technologies and strategies of specialization necessary for agricultural efficiency (Carter, 1997). For example, households with limited options for consumption smoothing grow lower return, but safer crops (sweet potatoes, sorghum and millet) than the richer households, which usually have more options for consumption smoothing. Risks may also motivate farmers to apply less productive technologies in exchange for greater stability (Morduch, 2002; Larson and Plessman, 2002). The cost of such an income-smoothing strategy can be high and a farmer may forgo up to 20 percent of his or her expected income to obtain a smoother income stream (Dercon, 1996).

Secondly, risks may function as a mechanism for economic differentiation within a population, deepening the poverty and food insecurity of some individuals even as aggregate food

availability improves (Carter, 1997). Thus, in the absence of risk management instruments, risky events may plunge particularly vulnerable households into poverty (Holzmann and Jorgensen, 2000). The policy message emanating out of these insights are that risks are detrimental to the welfare of poor households and that ensuring security of consumption is an essential ingredient of any poverty alleviation strategy (World Bank, 2001).

Dercon (2005) stated that there are two types of consequences of risk for poverty. First, there is the impact of shock: the event and the coping responses of the household may destroy or reduce the physical, financial, human or social capital of the household. Second, there is the behavioural impact, whereby households faced with risk and with access to limited insurance substitutes (such as assets or safety nets) are pushed towards risk management strategies, such as low risk activities and asset portfolios, at the expense of lower mean returns and incomes. Both processes result in a possibly permanent or persistent poverty impact of uninsured risk, therefore households have lower assets and portfolios of assets and activities with lower returns, thereby perpetuating lower long-term income and welfare outcomes.

Barrett et al. (2007) investigated the relationship between risk and poverty in Bangladesh, Ethiopia and Ghana. They focused on the understanding how idiosyncratic risk impacts the asset holdings of households and their productivity. They found that illness, injury and large family size as the most frequent causes of long-term impoverishment and impact the poor disproportionately.

2.3.4. Vulnerability to Poverty

Poverty and vulnerability are closely interlinked and while poverty is usually defined as economic deprivation (lack of income), vulnerability entails “the relationship between poverty, risk and efforts to manage risk” (Alwang, et al., 2001). Households may not be poor at present. They may be vulnerable to poverty in the future. Poor households without potential to escape poverty are also characterized as vulnerable (Conway and Turk, 2001). Moreover, poverty is a static and vulnerability a dynamic concept. While the poor can be quantified relatively easily ex-post despite the many dimensions of poverty (absolute poverty with regard to food consumption, housing etc. and relative poverty with regard to income), quantification of the vulnerable is much more difficult due to the dynamic and ex-ante perspective.

Recently there has been a shift towards the re-conceptualisation of poverty in terms of insecurity or vulnerability. And this in turn has two implications relevant to the analysis of the terrain for social protection. First, studies on vulnerability have shown that the composition of the poverty is in a continuous state of flux, implying that the incidence of poverty (measured, for example, as those below the poverty line) at any given point in time is an incomplete measure of the proportion of the (existing) population likely to experience poverty during a given period of time (say, 5 or 10 years). In other words, apart from *chronic* poverty (within which there are also significant movements, including cumulative processes of impoverishment towards destitution), there may also be considerable *transient* poverty - particularly, of the middle strata - reflected in the movements into and out of poverty over time (often also, at different points in the domestic cycle). McKay and Lawson (2002) stated the definition; transient poverty is temporary with households experiencing movements into and out of poverty while the chronic poverty is

experience persistent poverty over a reasonably long period of time. In the existence, there is the ‘sometimes poor’ (transient) intermingling with the ‘always poor’ (chronic). Beside that, the characteristics most commonly associated with chronic poverty such as lack of human capital, the demographic composition of households, location of residence, lack of ownership of physical assets and low-paid labour. Among factors that contribute to the transient of poverty include: family size, government transfers, seasonality of economic activities, migration and life cycle events. However, transient poverty is associated with the inability of families to maintain their consumption level when facing fluctuations or shocks that adversely affect their incomes or individual circumstance Jalan and Ravallion (1998), while chronic poverty is associated with income per capita or consumption levels persistently below the poverty line during a long period of time (Gaiha and Deolalikar, 1993). Second, a corollary of this dynamic view of poverty, important for policy analysis, is that, as Wood (2003) put it, “vulnerability is not synonymous with static poverty, so that the non-poor vulnerable need to be included in a pro-poor social policy”. This notion tallies well with the useful distinction the historian Brown (2002) drew between “*shallow*” and “*deep*” poverty: those *liable to become poor* as distinct from those who *are poor* and live in destitution. In other words, the shallow poor are but one degree of separation away from *deep* poverty inasmuch as “impoverishment could come at any time, from any number of misfortunes, from ill-health, from the death of spouses, parents and children, from economic and fiscal oppression, and from violence of every kind”. Widespread shallow poverty thus refers to a “society made up of countless *pauper sables*” - those liable to impoverishment.

The resulting consumption fluctuations can be expressed in terms of vulnerability to fall below a particular minimum consumption level, either temporary or in a permanent way. Different

operational definitions of this idea exist in the literature. Ravallion (1988) considered that transient versus chronic poverty. The chronically poor are defined as those with average consumption below the poverty line. Chronic poverty for an individual can then be measured using average consumption as the welfare indicator. Transient poverty for an individual is the average poverty over time minus chronic poverty. Aggregation using procedures as in standard poverty measures provides an overall measure of transient poverty. Using these definitions, Ravallion (1988) found that about half of total poverty is transient in the ICRISAT-sample; Jalan and Ravallion (1998) found high transient poverty in panel data from rural China: half of the mean squared poverty gap is transient. Other definitions of chronic and transient poverty are possible; the outcomes are similar. For example, using income data over 9 years from the ICRISAT panel in India, Gaiha and Deolalikar (1993) reported that about a fifth of households were poor in each year, but that only 12 percent were never poor, most households were poor for some time.

Balisacan and Fuwa (2007) stated that the micro-level literature focusing on poverty dynamics has highlighted the possible two-way causality between poverty and vulnerability (for example, Morduch 1995; Dercon 2005). On the one hand, poor households tend to be more vulnerable to various income shocks than their wealthier neighbours. Due to their poverty (e.g., low level of asset holding, limited access to credit, etc.), they are often ill prepared to cope with negative income shocks. Given their already low margin for survival, the direct consequences of suffering from the income shock could be quite severe.

The causality may not stop there, however; vulnerability could exacerbate the future depth of poverty. The very behaviour to cope with the risks could make their prospect of escaping poverty even more remote. Given the potentially dear consequences of negative income shocks, the poor may opt for “income smoothing” strategies by choosing safer but lower-return economic activities/investments, thereby forgoing potentially higher-return (but riskier) economic activities. In addition, some *ex post* risk-coping (consumption smoothing) behaviours (such as the depletion of assets) could erode the productive base for future income earnings.

CHAPTER THREE

DATA DESCRIPTION AND METHODOLOGY

In this chapter, we will describe the method of sample selection as well as the data used for the study. We will also provide a description of the approach used to analyse the data.

3.1 DATA DESCRIPTION

The study used primary and secondary data. Primary data are collected using structured questionnaire that was administered by trained enumerators. The information collected from households included households characteristic, as a demographic variable such as gender, age, marital status, household member, occupation, education, house characteristics; measurements of household's assets, income, expenditures, savings, debt and borrowing; and risk faced by households include risk management strategies employed by households. The data/information obtained through the survey will be complemented with secondary data obtained through official reports published by relevant agencies such as Department of Statistics, Economic Planning Unit and Ministry of Finance.

The populations of this study are rural households across all the states in Peninsular Malaysia. We have approached the Department of Statistics (DOS) to determine the sample for this study. The sample size is determined using the following approach: -

$$n_0 = \frac{Z^2 p(1-p)}{d^2} \quad (3.1)$$

Where

$z=1.96$ (standard score at the confidence level of 95%)

$P=0.5$ (maximum variance)

$d= 0.1$ (margin of error)

The approximate sample size is then expanded with an assumption of response rate of 80% (20% dropout) and design effect=2. Using the crude assumptions that there is one household for one living quarter and the optimum sample size for one enumeration block is eight, therefore the number of selected enumeration block is

$$\text{Number of selected EB}(n) = \frac{\text{Number of households (n for household)}}{8} \quad (3.2)$$

The framework used as a basis for the sample selection is total households living in the rural areas by state (not including Wilayah Persekutuan Kuala Lumpur and Wilayah Persekutuan Putrajaya). The calculation of sample size is done following the precision level of Peninsular Malaysia with the following distribution by state.

Table 3.1. Respondents by State

State	Frequency	Percent
Johor	69	13.8
Kedah	59	11.8
Kelantan	88	17.6
Melaka	8	1.6
N.Sembilan	32	6.4
Pahang	65	13.0
Perak	70	14.0
Perlis	8	1.6
Penang	26	5.2
Selangor	33	6.6
Terengganu	41	8.2
TOTAL	499	100.0

3.2. METHODOLOGY

Figure 3.1 to 3.3 illustrates the three types of analysis that are used for this study. As can be seen this study will employ both descriptive statistics and logistic model.

Figure 3.1. Analysis of Exposure to Risks

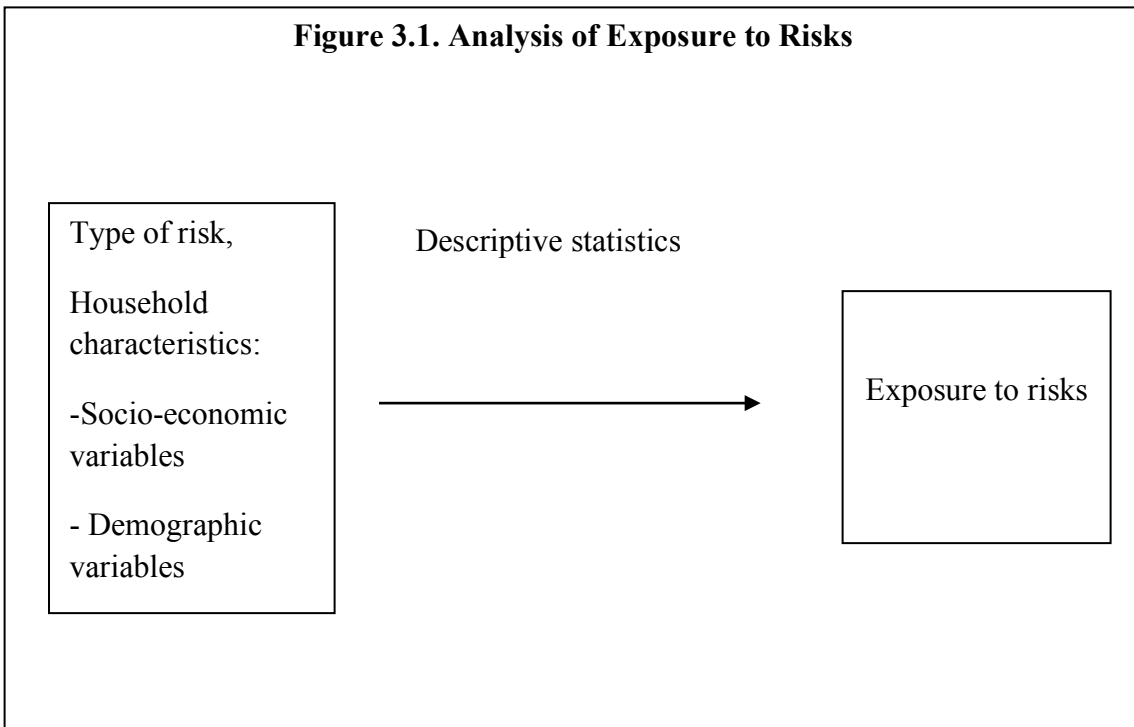
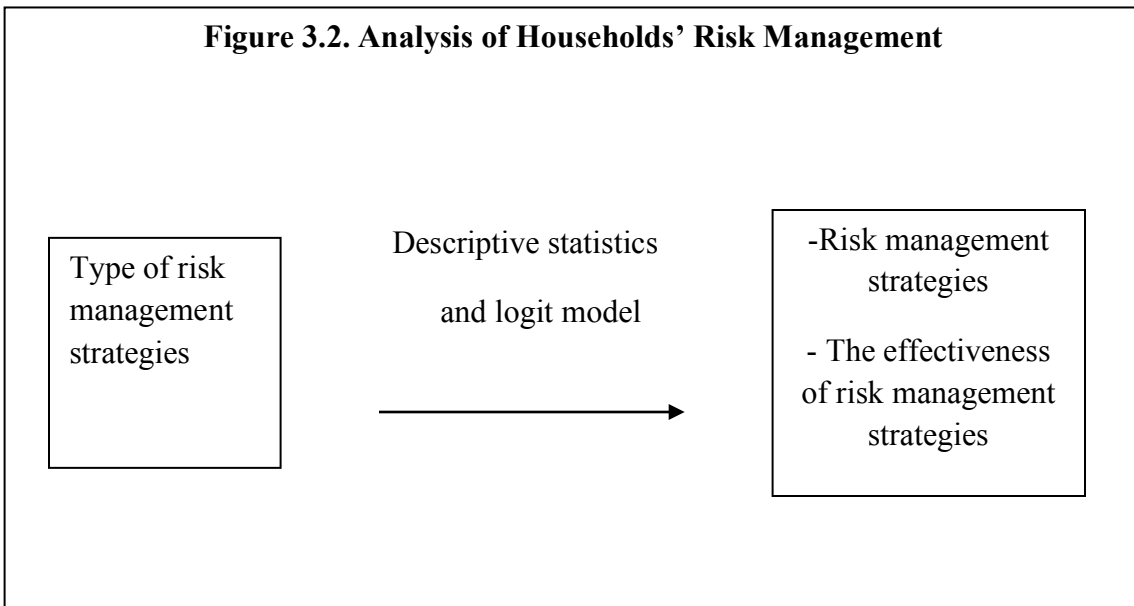
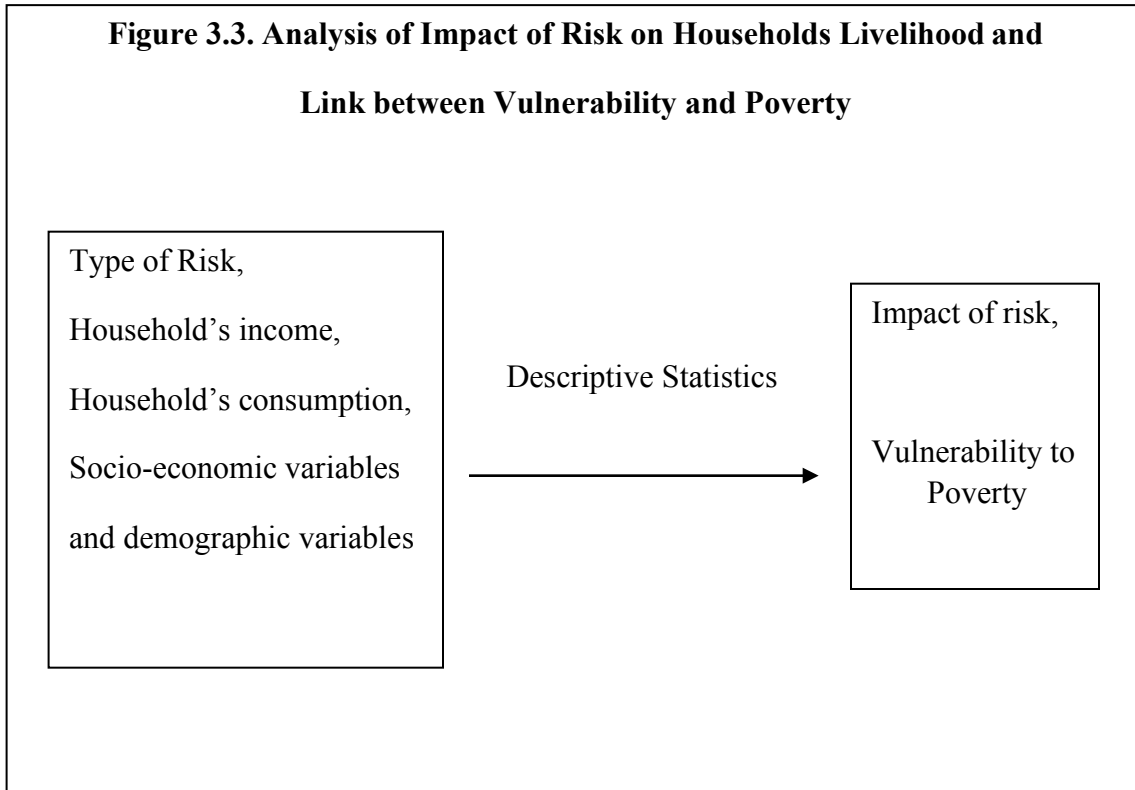


Figure 3.2. Analysis of Households' Risk Management





In addition to descriptive statistics, this study will also use logistic regression. Logistic regression is a part of category of statistical models called generalized linear models (Agresti, 1996). Binary logistic regression refers to the illustrate in which the observed outcome can have only two possible types for example “dead” and “alive”, “success” and “failure”, or “yes” and “no”. Logistic regression is a form of regression, which is used when the dependent is dichotomy and the independents are of any type. Moreover, Logistic regression can be used to predict a categorical dependent variable on the basis of continuous or categorical independents; to determine the effect size of the independent variables on the dependent variable; to rank the relative importance of independents; to assess interaction effects; and to understand the impact of covariate control variables. The impact of predictor variables is usually explained in terms of

odds ratios. However, an explanation of logistic regression begins with an explanation of the logistic function, which always takes on values between zero and one.

The dependent variable in logistic regression is usually dichotomous, that is, the dependent variable can take the value 1 with a probability of success θ , or the value 0 with probability of failure $1-\theta$. This type of variable is called a Bernoulli (or binary) variable. Although not as common and not discussed in this treatment, applications of logistic regression have also been extended to cases where the dependent variable is of more than two cases, known as multinomial or polytomous (Tabachnick and Fidell, 1996) use the term polychotomous).

As mentioned previously, the independent or predictor variables in logistic regression can take any form. That is, logistic regression makes no assumption about the distribution of the independent variables. They do not have to be normally distributed, linearly related or of equal variance within each group. The relationship between the predictor and response variables is not a linear function in logistic regression, instead, the logistic regression function is used, which is the logit transformation of θ :

$$\theta = \frac{e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}}{1 + e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}} \quad (3.3)$$

Where

α = the constant of the equation

β = the coefficient of the predictor variables

x = Independent variables

θ = Probability of the occurring event

An alternative form of the logistic regression equation is:

$$\text{logit}[\theta(x)] = \log\left[\frac{\theta(x)}{1-\theta(x)}\right] = \alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_ix_i \quad (3.3)$$

The goal of logistic regression is to correctly predict the category of outcome for individual cases using the most parsimonious model. To accomplish this goal, a model is created that includes all predictor variables that are useful in predicting the response variable. Several different options are available during model creation. Variables can be entered into the model in the order specified by the researcher or logistic regression can test the fit of the model after each coefficient is added or deleted, called stepwise regression.

There are two main uses of logistic regression. The first is the prediction of group membership. Since logistic regression calculates the probability of success over the probability of failure, the results of the analysis are in the form of an odds ratio.

The process by which coefficients are tested for significance for inclusion or elimination from the model involves several different techniques. Each of these will be discussed below.

A Wald test is used to test the statistical significance of each coefficient (β) in the model. A Wald test calculates a Z statistic, which is:

$$z = \frac{\hat{B}}{SE} \quad (3.4)$$

This z value is then squared, yielding a Wald statistic with a chi-square distribution. However, several authors have identified problems with the use of the Wald statistic. Menard (1995) warns that for large coefficients, standard error is inflated, lowering the Wald statistic (chi-square) value. Agresti (1996) states that the likelihood-ratio test is more reliable for small sample sizes than the Wald test.

The likelihood-ratio test uses the ratio of the maximized value of the likelihood function for the full model (L_1) over the maximized value of the likelihood function for the simpler model (L_0).

The likelihood-ratio test statistic equals:

$$-2 \log \left(\frac{L_0}{L_1} \right) = -2 [\log(L_0) - \log(L_1)] = -2(L_0 - L_1) \quad (3.5)$$

This log transformation of the likelihood functions yields a chi-squared statistic. This is the recommended test statistic to use when building a model through backward stepwise elimination.

The Hosmer-Lemshow statistic evaluates the goodness-of-fit by creating 10 ordered groups of subjects and then compares the number actually in the each group (observed) to the number predicted by the logistic regression model (predicted). Thus, the test statistic is a chi-square statistic with a desirable outcome of non-significance, indicating that the model prediction does not significantly differ from the observed.

The 10 ordered groups are created based on their estimated probability; those with estimated probability below 0.1 form one group, and so on, up to those with probability 0.9 to 1.0. Each of these categories is further divided into two groups based on the actual observed outcome variable (success, failure). The expected frequencies for each of the cells are obtained from the model. If the model is good, then most of the subjects with success are classified in the higher deciles of risk and those with failure in the lower deciles of risk (Connor, 2006).

This study used the logistic regression model to examine the following issues

- i. the probability of resolving a crisis
- ii. the determinants of savings
- iii. the determinants of access to loan

CHAPTER FOUR

FINDINGS AND ANALYSIS

In this chapter, we will discuss the findings of our study. We first examined the socio-demographic characteristics of our respondents. We then analysed the types of risk faced by the respondents and their effects on their livelihood. We also discussed the coping mechanisms employed by the respondents. Using the categories of coping mechanism proposed by Hotlzman (2001), we examine to what extent rural households could use these mechanisms when faced with a risk. Finally, we examine how would rural households view the types of risks that they will face in the future and how would they deal with it.

4.1. SOCIO-DEMO-ECONOMIC ANALYSIS OF THE SAMPLE

The distribution of respondents by race is presented in Table 4.1. Almost 90 percent of our sample is constituted by the Malay while the Chinese and the Indians represent 3.4 percent and 3.8 percent of the sample respectively, which in a way depicts the racial composition of rural Malaysia. Table 4.2 shows that the majority of the head of households are Muslim (90.4 percent).

Table 4.1. Head of Households Race

Race	Frequency	Percent
Malay	445	89.2
Chinese	17	3.4
Indian	19	3.8
Others	18	3.6
Total	499	100.0

Table 4.2. Head of Households Religion

Religion	Frequency	Percent
Islam	451	90.4
Hindu	14	4.0
Buddha	10	2.8
Christian	20	2.0
Others	4	0.8
Total	499	100.0

Most of the household head (86.0 percent) in our sample are male (Table 4.3). A woman heads only 70 households or 14 percent of the sample. As can be seen in Table 4.4, almost half of the households heads sampled for this study is aged 50 years and above. Less than 25 percent of the household heads is aged 40 years and below. This reflects the trend observed in most developing countries including Malaysia, whereby most of the youngsters have moved to the cities to seek better future for them and their dependents living behind the elderly in the rural areas.

Table 4.3. Head of Households Gender

Gender	Frequency	Percent
Male	429	86.0
Female	70	14.0
Total	499	100.0

Table 4.4. Head of Households Age Group

Age Group	Frequency	Percent
< 20	1	.2
21 - 30	38	7.6
31 - 40	70	14.0
41 - 50	145	29.1
51 - 60	134	26.9
> 60	111	22.2
Total	499	100.0

In term of education, 80 percent of the sample has undergone a formal education system, which means that 20 percent have never received any formal education (table 4.5). Only 33 percent has a secondary level of education and above (SPM and above) with only 4 percent with a tertiary education (Table 4.6).

Table 4.5. Formal Education

	Frequency	Percent
Yes	398	79.8
No	101	20.2
Total	499	100.0

Table 4.6. Highest Level of Education

Level of Education	Frequency	Percent
No Education	101	20.2
Lower Primary (Str1-3)	61	12.2
Higher Primary (Str 4-6)	67	13.4
Lower Secondary	94	18.8
Technical/Vocational School	7	1.4
Upper Secondary	138	27.7
Form 6 /Matriculation	11	2.2
Polytechnics /Teacher's Institute/College	9	1.8
University	11	2.2
Total	499	100.0

In term of types of employment (Table 4.7), 444 respondents or 88.9 of the sample declared having an economic activity. Most of them are employed in the agricultural sector (39.4 percent) and community service activity (21.0 percent). This implies that economic activities in rural Malaysia are still oriented towards the agricultural sector. In term of type of employment (Table 4.8), self-employment recorded the highest percentage with 46.6 percent followed by private-sector employee with 33.3 percent. Approximately, 13 percent of the sample works in the public sector while 4.1 percent is business owner.

Table 4.7. Sector of Employment

Sector	Frequency	Percent
Agriculture	175	39.4
Mining	6	1.4
Manufacturing	49	11.0
Construction	22	5.0
Transport and Communication	33	7.4
Wholesale, Hotel and Restaurant	44	9.9
Financial Intermediation	22	5.0
Community Service Activity	91	21.0
Total	444	100.0

Table 4.8. Type of Main Employment

Type of Employment	Frequency	Valid Percent
Employer/Owner	18	4.1
Civil Servants	56	12.6
Private Sector Employees	148	33.3
Self-employed	207	46.6
Others	15	3.4
Total	444	100.0

Because of the low level of education of our respondents, it is expected that their level of income would also be relatively low compared to the national average. As can be seen from Table 4.9, the majority of the sampled households (55.5 percent) declared an income of less than RM1000.00 per month with 21.2 percent earning less than RM500.00 per month. Another 30.9 percent of the sample earn between RM1,000.00 and RM2,000.00. There are also a few of the households that are relatively well to do with an income of more than RM10,000.00 per month.

Table 4.9. Income from Main Employment

Income Group	Frequency	Percent
0-499	106	21.2
500-999	171	34.3
1000-1999	154	30.9
2000-2999	38	7.6
3000-3999	19	3.8
4000-4999	8	1.6
>10000	3	0.6
Total	499	100.0

Other than income earned from their main employment, some of the households sampled also have additional income obtained from earnings from another additional economic activities (side income) or from non-economic activities (transfer and other incomes). Table 4.10 shows that 21.2 percent of the households have a side income. However, the amount of side income earned is relatively small. Almost 70 percent of those who declared having a side income earn less than RM1,000.00 while 4.4 percent of them earned between RM1,000.00 to RM2,000.00.

Table 4.10. Side Income

Income Group	Frequency	Percent
0	393	78.8
0-499	28	5.6
500-999	45	9.0
1000-1999	22	4.4
2000-2999	9	1.8
3000-3999	1	.2
5000-10000	1	.2
Total	499	100.0

As for transfer and other incomes, a slightly higher percentage of the households sampled earn such an income. Table 4.11 shows that 40 percent has received a transfer income. However, the amount obtained is very low. More than 60 percent of those who obtained a transfer, received less than RM500.00. Only two percent of them received more than RM2000.00 of transfers or other incomes. The transfer income are in the form of monthly allowances sent by children to their parents, zakat or tithes payments, social assistance from the Social Welfare Department, pension, scholarships, dividends and rentals. As shown by Table 4.12, the majority of those receiving transfers income (59.2 percent) received it in the form of allowance from their children. This implies that social bonding is still present especially in the rural area. The findings on the level of income above show that more than 50 percent of our respondents earn less than RM1,000.00 per month. However, Table 4.13 shows that only 22.9 percent of those who received an income transfer (or 9.2 percent of the total sample) received assistance from the Social Welfare Department. Furthermore, only 12.4 percent of them (or 5.0 percent of the total sample) received zakat payment. Together, these findings imply that a major portion of the poor rural population is being left out from any form of assistance from the government.

Table 4.11. Transfer and Other Income

Income Group	Frequency	Percent
0	298	59.7
0-499	131	26.3
500-999	44	8.8
1000-1999	22	4.4
2000-2999	2	.4
3000-3999	1	.2
5000-10000	1	.2
Total	499	100.0

Table 4.12. Types of Transfer and Other Incomes

Types of transfer	Frequency	Percent
Children	119	59.2
JKM	46	22.9
Zakat	25	12.4
Pension	34	16.9
Scholarship	13	6.5
Rental	9	4.5
Dividend	6	3.0

By combining these three types of income (main income, side income and transfer income), we managed to obtain the total income of the households sampled in our survey (Table 4.13). As can be seen, almost 40 percent of the respondents earned less than RM1,000.00 per month with 11.6 percent earning less than RM500.00 per month. However, 22.4 percent of the respondents earned more than RM2,000.00 per month with approximately five percent earning more than RM4,000.00 per month. These findings show that poverty incidence remains an issue in rural Malaysia. Furthermore, most of the rural households earn an income that are very near to the poverty line income level which makes them very vulnerable into falling into the poverty trap if they were face with any adverse shocks.

Table 4.13. Total Household Income

Income Group	Frequency	Percent
0-499	58	11.6
500-999	137	27.5
1000-1999	192	38.5
2000-2999	52	10.4
3000-3999	36	7.2
4000-4999	18	3.6
5000-10000	4	.8
>10000	2	.4
Total	499	100.0

4.2. RISK/CRISIS AND COPING STRATEGIES

One of the objectives of this study is to examine the types of shock or crisis faced by rural households in Peninsular Malaysia and its effects on their livelihood. The respondents have been asked whether they have faced any type of risk or shock during the whole period of the previous year. Of the 499 households surveyed, 199 of them have experienced at least a shock. The types of shock/crisis faced are listed in Table 4.14.

Table 4.14. Types of Shock/Crisis Faced by Households Last Year

Types of Crisis	Frequency	Percent
Flood	59	11.8
Salary reduced	42	8.4
Working household member felt sick	41	8.2
Household member felt sick	40	8.0
Crops destruction	28	5.6
Theft/Burglary	25	5.0
Job loss	21	4.2
Working household member Accident	15	3.0
Death of working household member	14	2.8
Household member Accident	13	2.6
Death of household member	12	2.4
Living stocks destruction	11	2.2
Cheatings	10	2.0
Storm/Typhoon	9	1.8
Bankruptcy	9	1.8
Family	7	1.4
Fire	5	1.0
Landslide	2	0.4
Riots	1	0.2

As can be seen, our respondents have faced quite a variety of shocks. Flooding is the shock that affected the highest number of respondents with 59 respondents or 11.8 percent of the total respondents. Other types of shocks that have a relatively higher number of occurrences are reduction in salary (8.4 percent), working member of households falling ill (8.2 percent), member of households falling ill (8.0 percent), destruction of crops (5.6 percent) and

theft/burglary (5.0 percent). Our findings also show that most of the shocks faced are idiosyncratic in nature whereby it affects only one particular household.

In coping with the shocks, the respondents have used several mechanism and strategies (Table 4.15). Among the strategies that have been most employed by the respondents are reducing expenditure with more than 58 percent of those who are faced with a shock using it as a coping mechanism, withdrawal of savings (35.7 percent), borrowing from other family members (17.1 percent), reducing food consumption (12.1 percent) and getting assistance from the government (11.6 percent). Other strategies that are also being used by the respondents are liquidating asset (9.5 percent), getting help from other family members (9.0 percent), getting additional jobs (7.0 percent), borrowing from friends or neighbours (5.0 percent), pawning jewellery/gold (4.5 percent) and obtaining a loan from banks (4.0 percent). Our findings on the coping methods used by households when faced with a risk do not differ much the findings of other studies especially on the use of own savings and assets as well as on the reliance on the support or solidarity of other family members or friends (see for example Fafchamps, 1992, Lybbert and Carter, 2009 or SeyiOlalekan et al., 2011).

Table 4.15. Coping Strategies

Types of strategy	Frequency	Percent
Reduce Food	24	12.1
Reduce Expenditure	117	58.8
Liquidate Asset	19	9.5
Withdraw Savings	71	35.7
Borrow from family	34	17.1
Borrow from friends/neighbours'	10	5.0
Borrow from banks	8	4.0
Assistance from family	18	9.0
Assistance from friends/neighbours	3	1.5
Assistance from Government	23	11.6
Assistance from Associations	7	3.5
Assistance from Political Parties	4	2.0
Additional work	14	7.0
Move to another place	2	1.0
Drop children from school	4	2.0
Send Children to work	3	1.5
Send spouse to work	3	1.5
Pawn Gold/Jewellery	9	4.5
Assistance from the public	1	0.5
Did nothing	41	20.6

The coping mechanisms listed in Table 4.15 can be further group into six categories following Holzmann (2001) namely

- i. Self-insurance or self-help
- ii. Informal insurance
- iii. Market Insurance
- iv. Government assistance
- v. NGOs/Association assistance
- vi. Others

Table 4.16 summarizes the types of mechanism employed according to these categories. Since the respondents can employ more than one coping mechanism, the total of answers for all the six categories is more than the number of households faced with a shock.

Table 4.16. Coping Mechanism Categories

Category	Frequency	Percent
Self-Insurance	266	64.3
Informal Insurance	65	15.7
Market Insurance	8	1.9
Government Help	23	5.6
NGOs/Association	11	2.7
Others	41	9.9
Total	414	100.0

Table 4.16 shows that self-insurance is the most employed coping mechanism by the rural households in Peninsular Malaysia when they are faced with a crisis. This implies that rural households will normally depend on themselves or their household' members when dealing with a crisis. This result may also assistance from a third party such as friends, governments or association can be considered as secondary.

In analysing recovery from crisis in general, our findings show that approximately 40 percent of the respondents who have faced a crisis have recovered from it (Table 4.17). Another 60 percent of the respondents are yet to exit from the crisis with 36.7 percent of respondents who have partially recovered from the shock and 26.1 percent who have experienced no recovery at all. These findings provide us with some idea on the effectiveness of the crisis. As can be seen, only a small percentage of those affected by a shock have managed to successfully cope with the risk and fully recover from it. This implies that for most of those affected by a shock, the strategies used by them are not very effective in order to bring them out from the crisis.

Table 4.17. Recovery from Crisis

Recovery from Crisis	Frequency	Percent
Fully recovered	74	37.2
Partially recovered	73	36.7
Not yet	52	26.1
Total	199	100.0

Table 4.18 cross-tabulates recovery from crisis and types of crisis in order to see which types of crisis that are easier to recovered from. As the households can face more than one crisis during a period of one year, the total may exceed 199 households. Therefore, the unit of analysis is no longer household but the crisis itself. As can be seen, for some crisis such as theft, accident of a working member of household and fire, the recovery rate is more than 60 percent with a 100 percent for fire. Other crisis for which the recovery rate is relatively high (more than 50 percent) are destruction of living stocks (54.5 percent), storm/typhoon (55.6 percent), bankruptcy (55.6 percent), cheatings (50 percent), and landslide (50 percent). On the other hand, some crisis seems more difficult to deal with the rate of recovery well below average such as crops destruction

(14.3 percent), death of working household member (14.3 percent), death of household member (16.7 percent), sickness of a working household member (22 percent), job loss (23.8 percent) and flood (27.1 percent).

Table 4.18. Types of Shock/Crisis Faced and Recovery

Types of Crisis	Crisis Recovery						TOTAL
	Fully Recovered		Partially Recovered		Not Yet Recovered		
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Flood	16	27.1	29	49.2	14	23.7	59
Salary reduced	13	31.0	23	54.8	6	14.3	42
Working household member felt sick	9	22.0	20	48.8	12	29.3	41
Household member felt sick	15	37.5	10	25.0	15	37.5	40
Crops destruction	4	14.3	16	57.1	8	28.6	28
Theft/Burglary	15	60.0	8	32.0	2	8.0	25
Job loss	5	23.8	8	38.1	8	38.1	21
Working household member Accident	11	73.3	1	6.7	3	20.0	15
Death of working household member	2	14.3	9	64.3	3	21.4	14
Household member Accident	5	38.5	5	38.5	3	23.1	13
Death of household member	2	16.7	5	41.7	5	41.7	12
Living stocks destruction	6	54.5	3	27.3	2	18.2	11
Cheatings	5	50.0	3	30.0	2	20.0	10
Storm/Typhoon	5	55.6	3	33.3	1	11.1	9
Bankruptcy	5	55.6	4	44.4	0	0.0	9
Marriage	3	42.9	4	57.1	0	0.0	7
Fire	5	100.0	0	0.0	0	0.0	5
Landslide	1	50.0	0	0.0	1	50.0	2
Riots	0	0.0	0	0.0	1	100.0	1

It is noteworthy that a relatively high percentage of the respondents (20.6 percent) have chosen to do nothing when a faced with a shock. This may imply that these households have nothing that they can employ as coping mechanism. It may also imply that the shock faced is considered not significant enough for them to employ any mechanisms. It is a matter of concern especially from the perspective of vulnerability to poverty if the former is the main reason why some households chose to do nothing when faced with a risk then. However, if we examine further to what extent doing nothing can affect exit from a crisis, our findings show that 53.7 percent of respondents who did nothing still managed to recover from the crisis (Table 4.19). This in a way indicates that for them the crisis may not be significant enough to require any action from their part. Another 46.3 percent of respondents who have chosen to do nothing are yet to recover from the crisis with 22.0 percent saying that they have partially recovered and another 24.3 still enduring the shock. It may not be farfetched to assume that for these households, doing nothing is not a deliberate choice but rather an option that they are forced to choose since there is simply no other option available to them.

Table 4.19. Recovery from Crisis and Doing Nothing as a Strategy

Recovery from Crisis	Did Nothing	
	Frequency	Percent
Fully recovered	22	53.7
Partially recovered	9	22.0
Not yet	10	24.3
Total	41	100

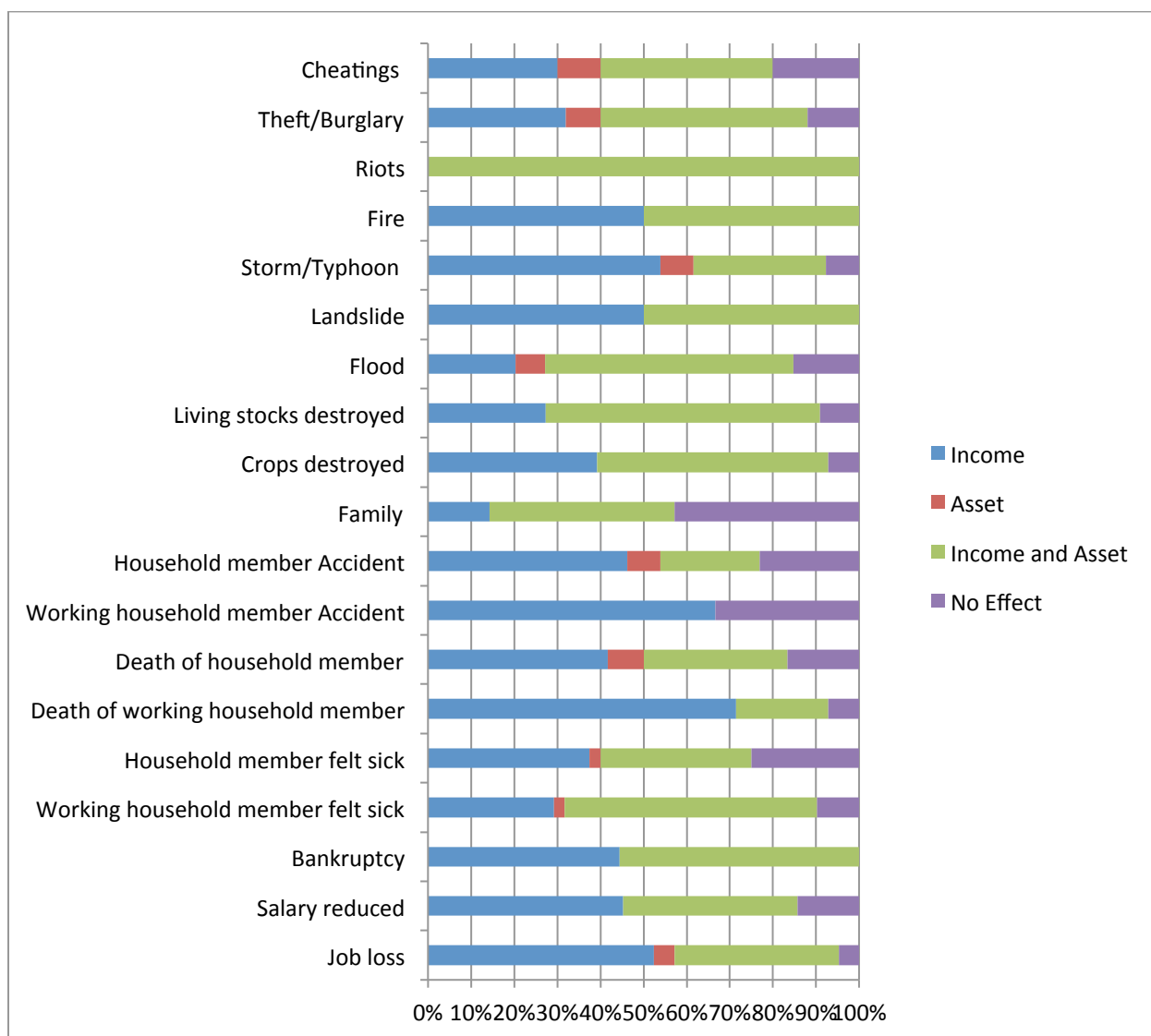
The respondents are also asked about the effects of the crisis on their income and asset. Our findings in Table 4.20 show that 41.7 percent of those who have experienced a shock mentioned that their income has been affected by the crisis while 4.5 percent of the respondents have their asset affected by the crisis. Another 36.2 percent of the respondents said that both their income and asset are affected by the crisis. Finally, there are 17.6 percent of the respondents whose neither income nor asset is affected by the crisis.

Table 4.20. Effects of Crisis

Types of effect	Frequency	Percent
Income	83	41.7
Asset	9	4.5
Income and Asset	72	36.2
No Effect	35	17.6

Figure 4.1 shows the effects of shocks by types of shocks faced by the respondents. It provides us with some idea on what type of shocks that has a more severe impact on the income or asset, and which type of shock can be considered as more benign. As can be seen, most of the shocks have an impact on the income or asset (or both of them) of those who faced the shocks. For example, all households who reported having experienced shocks related to fire, rioting, landslide and bankruptcy have their income or asset affected by the crisis. However, the figure also show that for certain type of shock such as family and accident met either by a member of the household or a working member of the household, the impact on income and asset seems to be less.

Figure 4.1. Types and Effects of Shocks



The extent to which the crisis affected the livelihood of the respondents was examined by looking at the economic situation of the respondents at the outset of the crisis (Table 4.21). Our findings show that the shock did have a negative impact on the livelihood of the affected households as more than 60 percent of the respondents said that their economic situation has become worse after the crisis. It is noteworthy that eight percent of the respondents mentioned

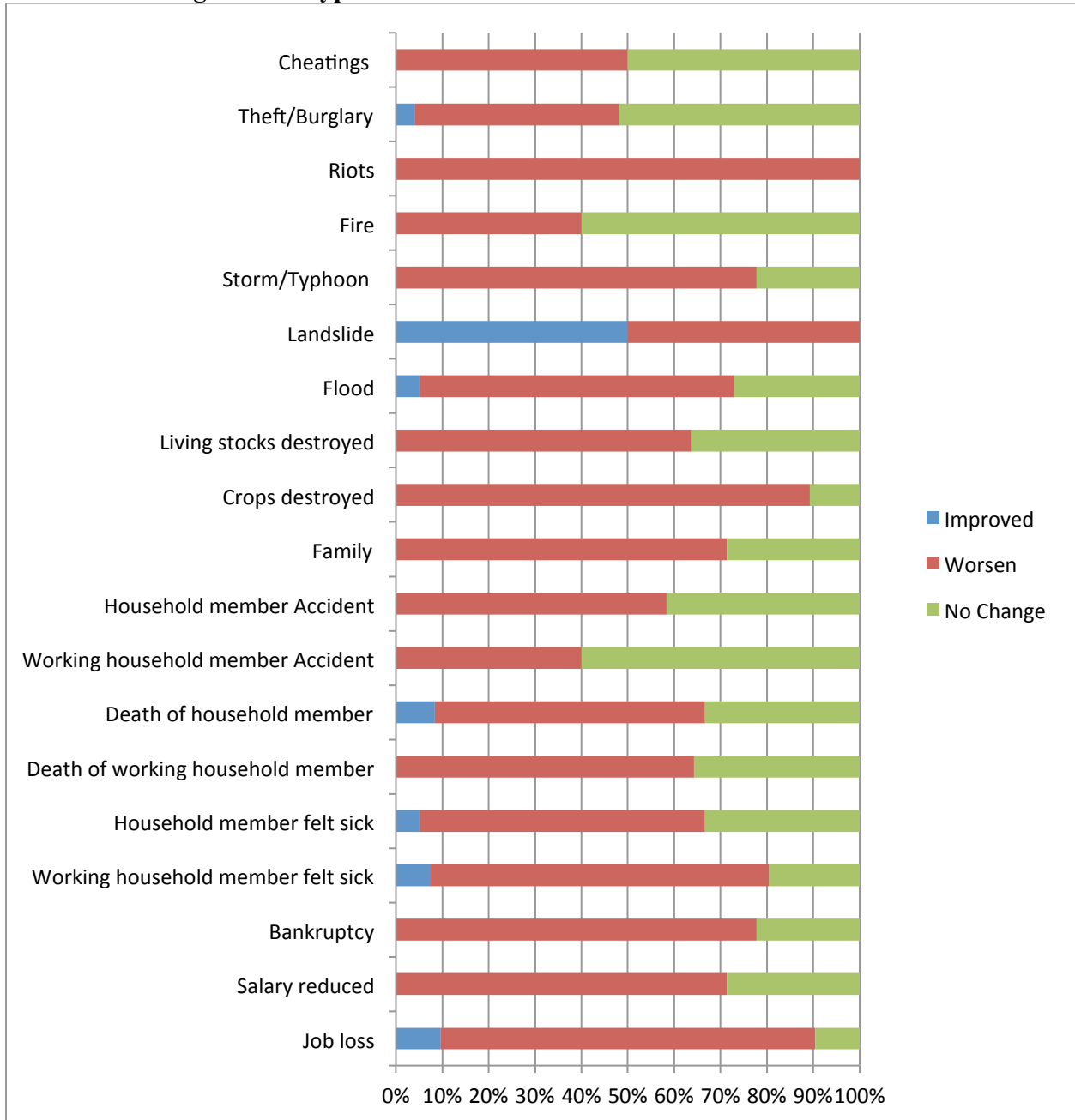
that somehow the crisis has led them to a better economic situation as compared to their situation prior to the occurrence of the shock.

Table 4.21. Economic Situation after Crisis

Economic Situation	Frequency	Percent
Better	8	4.1
Worse	126	62.9
No Change	65	33.0
Total	199	100.0

The effect of shock on the economic situation of the households affected also differs according to the types of shock. This is shown in Figure 4.2. For some shocks, the effect is more devastating to the household affected and for others, only few households have seen their economic situation affected. For example, for shock such as riots, job loss, crops destruction and storm/typhoon, more than 70 percent of the households affected by them have seen their economic situation worsen. However, less than 50 percent of the household affected by shocks such as sickness of household members, cheating or burglary has seen their economic situation worsen by them.

Figure 4.2. Types of Shocks and Economic Situation Post Shock



The impact of the crisis on economic situation does not seem to be different according to income level. As shown by Table 4.22, the proportion of households affected by the risk seems to be similar across all the level of income.

Table 4.22. Economic Effect by Income Group

Income group	Economic effect				Total
	No		Yes		
	Frequency	Percent	Frequency	Percent	
0-499	9	37.5	15	62.5	24
500-999	19	30.6	43	69.4	62
1000-1999	25	38.5	40	61.5	65
2000-2999	12	48.0	13	52.0	25
3000-3999	4	28.6	10	71.4	14
4000-4999	3	42.9	4	57.1	7
>10000	1	50.0	1	50.0	2
	73		126		199

The respondents were also asked whether they would be able to handle if the same crisis were to occur again the future. As shown in Table 4.23, more than 63 percent of the respondents were optimistic in their capacity to cope with the same risk in the future. This is contrast to the real situation whereby only 37.2 percent managed to recover from a crisis that they are faced with. This may imply that the households overestimate their future capacity to deal with a crisis. This will then serious implication on the way these households will prepare themselves for future risk such as by constituting less savings or holding less asset.

Table 4.23. Ability to Face Crisis Again

Economic Situation	Frequency	Percent
Yes	124	62.3
No	75	37.7
Total	199	100.0

4.3. RECOVERY FROM CRISIS AND SOCIO-ECONOMIC CHARACTERISTICS

Our analysis above has shown that only 37.2 percent of the respondents who are faced with a shock managed to recover from the crisis. In order to examine further the effect of socio-economic factors on the probability of an exit from crisis, we have conducted the following logistic analysis.

$$\text{logit}[\theta(\chi)] = \log\left[\frac{1(\chi)}{0(\chi)}\right] = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \beta_5\chi_5 + \beta_6\chi_6 + \beta_7\chi_7 + \beta_8\chi_8 + \beta_9\chi_9 + \beta_{10}\chi_{10} + \beta_{11}\chi_{11} \quad (4.1)$$

Where

θ = Probability of recovering from the crisis

$1(\chi)$ = those who recovered from the crisis

$0(\chi)$ = those who are yet to recover from the crisis

$\beta_{1, \dots, 6}$ = the coefficient of the each predictor variables

$\chi_{1, 6}$ = Independent variables are:

χ_1 = gender of household head, χ_2 = age of household head, χ_3 = size of the household, χ_4 = education level of household head, χ_5 = savings and χ_6 = total income of the households.

The results of the estimation are reported in Table 4.24.

Table 4.24. Determinants of Recovery from Crisis – Logistic Model

	Coefficient	Std. Error	Z	P(z)
Gender	1.4945	0.6886	0.87	0.383
Age	0.9927	0.0128	-0.57	0.570
Household size	0.8530*	0.0811	-1.67	0.095
Education	0.6247	0.2763	-1.06	0.287
Savings	2.2066*	0.9062	1.93	0.054
Income	1.0003**	0.0001	2.01	0.045

Notes: Number of obs = 199, LR chi2(6) = 15.04, Prob> chi2 = 0.0199, Log likelihood = -123.80598, Pseudo R2 = 0.0573.

*significant at 10% level, **significant at 5% level, ***significant at 1% level

The results of our estimation show that there are three socio-demographic factors that are found to have a significant effect on the probability of exiting from a crisis namely size of household, savings and income level. As can be seen from Table 4.24, an increase of one unit in household size would lead to an increase in the probability of recovering from a crisis by 0.85. This finding may seem odd as it can be expected that bigger households may find it more difficult to cope with a risk. On the other hand, bigger households may also mean that the burden of the risk may be shared by more individuals therefore increasing the odds of exiting from the crisis.

It is also found that the odds of exiting from a crisis are higher for households with savings as compared to those who don't have any. This finding indicates the important role of savings as an effective coping mechanism among rural households in Malaysia. It is in line with our previous finding that shows that saving is one of the most used strategies by households faced with a shock.

The results of our estimation also show the significant effect of income level on the probability of recovering from a crisis. Households with higher income seem to have a higher probability of recovering from a crisis as compared to those with a lower level of income. This finding can be explained by the fact that those with a higher level of income usually have access to more effective coping mechanisms.

4.4. ANALYSIS OF RISK MANAGEMENT STRATEGIES

In what will follow, we will focus our analysis on the capacity of rural household to manage risk through self-insurance, market insurance as well as informal insurance. We will also analyse the role that the government can or have played in assisting households to cope with a shock. We used the classification proposed by Hotlzman (2001) according to whom there are five categories of risk-coping mechanisms. In our case, self-insurance will be analysed by looking at the level of saving and assets holdings of the households. Market insurance will be analysed from the perspective of access to loans by formal institutions. We will use the extent to which households in rural Malaysia could rely on surrounding community as an indicator of informal insurance.

4.4.1. Savings/Asset Holdings

In analysing the impact of risks or shocks on the well being of households, one important factor that need to be taken into consideration is the level of savings or asset that are owned by the households in question. Indeed, when faced with a risk, households will normally use their savings or liquidate their assets as their first resort to cope with the shock. Therefore, it is

expected that households with ample savings or assets should be less vulnerable as compared to those who have no or very little savings or assets. In the following analysis, we will examine to what extent rural households in Peninsular Malaysia could use their saving and assets holding as an effective coping mechanism. In our questionnaire, several questions related to saving and asset have been asked in order to have some ideas on these aspects.

Table 4.25 shows that the majority of our respondents (70.7 percent) do have some level of savings. As our respondents are mostly Malay Muslims, most of them have savings in the Amanah Saham Bumiputera (35.67 percent) or in the Tabung Haji (28.26 percent). EPF is another important form of saving with 20.44 percent respondents. It is noteworthy that only 8.02 percent of the respondents have subscribed to an insurance scheme while only 2.4 percent possess a medical insurance.

Table 4.25. Savings

	Frequency	Percent
Yes	353	70.7
No	146	29.3
Total	499	100.0

Table 4.27 shows whether level of income has any influence on savings. As can be seen, even among those who earn less than RM500.00 per month, 34.5 percent of them have some savings. However, as we go higher in the level of income, the percentage of those having a saving increases as well. For example, 60.6 percent of those who earn between RM500.00 and RM1,000.00 own a saving. However, more than 90 percent of those who earn RM2,000.00 and

above own a saving. It should be noted nevertheless than the level of income is not the sole criteria that determine whether a household own a saving or not.

Table 4.26. Types of Savings

Types of Savings	Frequency	Percent
ASB	183	36.67
Tabung Haji	141	28.26
EPF	102	20.44
Fixed Deposit	47	9.42
Saving/Current Account	45	9.02
Insurance Scheme	40	8.02
Medical Insurance	12	2.40
Cooperative Association	11	2.20
Unit Trust	6	1.20

Table 4.27. Saving by Level of Income

Total HH Income	Savings				Total
	Yes		No		
	Frequency	Percent	Frequency	Percent	
0-499	20	34.5	38	65.5	58
500-999	83	60.6	54	39.4	137
1000-1999	147	76.6	45	23.4	192
2000-2999	46	88.5	6	11.5	52
3000-3999	34	94.4	2	5.6	36
4000-4999	17	94.4	1	5.6	18
5000-10000	4	100.0	0	0.0	4
>10000	2	100.0	0	0.0	2
	146		353		499

If we look at the amount of saved every month by our respondents, most of them (65.5 percent of those who have a saving) save less than five percent of their monthly income (Table 4.28). Only 10.8 percent of them save more than 10 percent of their monthly income. However given their relatively low level of income, it is expected that the amount of savings of our respondents should also be relatively small.

Table 4.28. Amount of Savings (% of Income)

Percent of Income	Frequency	Percent
<5%	231	65.5
5-10%	84	23.7
10-20%	31	8.8
20-50%	6	1.7
>50%	1	.3
Total	353	100.0

In discussing the issue of saving as a coping mechanism, we should not only examine the amount of saving as well as the proportion of income saved. We should also examine to what extent the amount saved could sustain the livelihood of a household. Table 4.29 shows that for most of the respondents (55.2 percent) their savings would last for less than 3 months. Out of this 55.2 percent, 24.9 percent declared that their savings could only last them for less than one month. This implies that for these households, they would not be able to rely on their saving alone in case of a shock. On the other hand, for 23.6 percent of the respondents who have savings, their level of savings is substantial enough to sustain them for more than six months. As to the use of these savings, Table 4.28 shows that most of the respondents use their savings only when in need (78.2 percent).

Table 4.29. How Long Will the Savings Last?

Month	Frequency	Percent
<1 Month	88	24.9
1-3 Months	107	30.3
3-6 Months	73	20.7
6-12 Months	55	15.6
>1 Year	30	8.5
Total	353	100.0

Table 4.30. Frequency of Withdrawal

	Frequency	Percent
Always	42	11.9
When in Need	276	78.2
Never	35	9.9
Total	353	100.0

The respondents were also asked whether their level of savings is sufficient in the event of a shock (Table 4.31). Only 34.7 percent of them responded positively while 65.3 percent said no. If we take into account only those who have a saving (353 respondents), only half of them (50 percent) agreed that their level of saving would suffice to face an adverse shock.

Table 4.31. Sufficiency of Saving

	Frequency	Percent
Yes	173	34.7
No	326	65.3
Total	499	100.0

As to the reasons why their savings are not sufficient, the majority of them mention that their low level of income prevented them from saving more (Table 4.32). Some of them believe that they can rely on their family in case of the problem (15 percent) while another 3.9 percent believe that they should be able to get assistance from the government.

Table 4.32. Reasons Savings Insufficient

Reason	Frequency	Percent
Income not enough	300	92.0
Can rely on family	49	15.0
Can Rely on Government	13	3.9
Can rely on neighbours/friends	7	2.1
Can Rely on Association	2	0.6

In term of asset ownership, most of the respondents are in the possession of one or several forms of assets (Table 4.33). More than 80 percent of the respondents own a house while 56.5 percent of them own a car. Another 46.7 percent posses a land and 15.2 percent possess gold jewellery. There are also a few of the respondents who own plantations, shops and rented property. Based on these findings it can be concluded that even though the income level of the rural households are relatively low, they are relatively well endowed in asset especially in term of house or land. However to what extent these assets could be used as a buffer against an adverse shock depends on several other factors. Would the households be able to liquidate these assets easily? How dependent are they to these assets for their livelihood?

Table 4.33.Types of Asset

Type of Asset	Frequency	Percent
House	411	82.4
Car	282	56.5
Land	233	46.7
Gold	76	15.2
Plantation/Orchard	45	9.0
Living stocks	24	4.8
Shops	23	4.6
Lorry/Heavy Machinery	15	3.0
Rented Property	13	2.6
Equity/Bonds	4	0.8

In analysing saving behaviour of rural households, another issue that arises is what are the factors that determine saving decision. In order to examine further the determinants of saving among rural households in Peninsular Malaysia, we have estimated the following logistic model:-

$$\text{logit} \left[\frac{\theta(\chi)}{1-\theta(\chi)} \right] = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \beta_5\chi_5 + \beta_6\chi_6 + \beta_7\chi_7 + \beta_8\chi_8 + \beta_9\chi_9 + \beta_{10}\chi_{10} + \beta_{11}\chi_{11} \quad (4.2)$$

Where

θ = Probability of having a saving

$1(\chi)$ = those who have saving

$0(\chi)$ = those who do not have a saving

$\beta_{1,...,6}$ = the coefficient of the each predictor variables

$\chi_{1,...,6}$ = Independent variables are:

χ_1 = gender of household head, χ_2 = age of household head, χ_3 = size of the household, χ_4 = education level of household head, χ_5 = savings and χ_6 = total income of the households.

The results are presented in Table 4.34.

Table 4.34. Determinants of Savings – Logistic Model

	Coefficient	Std. Error	Z	P(z)
Gender	0.7269	0.2306	-1.01	0.315
Household size	1.0687	0.0681	1.04	0.297
Age	1.0336***	0.0094	3.64	0.000
Education	3.5985***	1.0394	4.43	0.000
Income	1.0011***	0.0002	5.59	0.000

Notes: Number of obs= 499, LR chi2(5) =92.00, Prob>chi2 =0.0000, Log likelihood = -255.61983, Pseudo R2 = 0.1525

*significant at 10% level, **significant at 5% level, ***significant at 1% level

As can be seen, there are three variables that are found to have a significant effect on the probability of having a saving namely income level, education and age. For every one unit change in income, the odds of savings increase by 1.0011. This is in line with our findings in Table 4.27. As for education, a formal education leads to an increase in the odds of savings by 3.5985. Finally, the odds of saving increase by 1.0336 with an increase of one unit of age. However, our model shows that there is no significant relationship between gender as well as household size and savings.

In conclusion, our findings show that the majority of rural households would not be able to rely solely on their savings and assets as a coping mechanism when faced with a negative shock. Most of them have very little or no savings at all which is due in particular to their low level of income. It is also found that age and level of education also determine the saving decision of a household.

4.4.2. Access to Loans

Access to a functioning formal credit market is another important factor that determines the capacity of individuals to cope with a shock. However, not all individuals especially in the rural areas have access to a formal credit market. Some of them may have difficulty in getting loans from traditional banks due to a number of reasons such as low level of income, bad credit history or no bank. Therefore, some of them have had to resort to other informal sources of funds such as from family members, friends or neighbours. However, such sources of funds may run dry in the case of co-variant shocks where everybody will be affected by the shock.

In our survey, we have also looked into the issue of access to credit of rural households in Peninsular Malaysia. This will provide us with some ideas to what extent they would be able to use this channel when faced with a shock.

Table 4.35 shows that only 19.2 percent of the respondents have contracted a loan. As to the question from where this loan is secured, only 8.6 percent of the respondents mentioned that they the loan is secured from a bank (Table 4.36). And if we take into account other formal financial institutions namely micro-credit institutions and association/cooperative, the percentage of those who contracted loan from these types of institutions is still very low (12.4 percent). This implies that access to formal credit market is relatively limited among the rural households in Peninsular Malaysia. As for loan taken from family members or friends, the percentage is also very low. Five percent of the respondents have borrowed money from their family members and only 1.8 percent has borrowed from their friends.

Table 4.35. Loans

	Frequency	Percent
Yes	96	19.2
No	403	80.8
Total	499	100.0

Table 4.36.Sources of Loans

	Frequency	Percent
Family	25	5
Neighbours	8	1.6
Friends	2	0.4
Shop Owners/Grocers	4	0.8
Association/Cooperatives	8	1.6
Micro Credit	11	2.2
Banks	43	8.6
Others	7	1.4

If we look at the income profile of those who have contracted a loan, we can see that they are mostly those who earned between RM500.00 and RM3,000.00 (Table 4.37). Our data also show that the majority of those of who have access to formal loans (banks, microcredit institutions and cooperatives) are those who earn between RM1,000.00 and RM4,000.00 (Table 4.38). Therefore, it can be concluded here that level of income is a major factor in explaining access to a formal credit market, which in a way explain why only a small percentage of our respondents have contracted loan from this source.

Table 4.37. Loans and Level of Income

Income Group	Loans				Total
	Yes		No		
	Frequency	Percent	Frequency	Percent	
0-499	11	10.4	95	89.6	106
500-999	23	13.5	148	86.5	171
1000-1999	40	26.0	114	74.0	154
2000-2999	13	34.2	25	65.8	38
3000-3999	8	42.1	11	57.9	19
4000-4999	1	12.5	7	87.5	8
>10000	0	0.0	3	100.0	3
	96	19.2	403	80.8	499

Table 4.38. Loans from Formal Institutions and Level of Income

Income Group	Loans from formal Institutions	
	Frequency	Percent
0-499	3	4.8
500-999	4	6.4
1000-1999	32	51.6
2000-2999	11	17.8
3000-3999	9	14.6
4000-4999	3	4.8
>10000	0	0.0
	62	100.0

To have a better understanding of the determinants of access to loans, we have run the following logistic regression on whether a household has contracted a loan or not

$$\text{logit}[\theta(\chi)] = \log\left[\frac{1(\chi)}{0(\chi)}\right] = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \beta_5\chi_5 + \beta_6\chi_6 + \beta_7\chi_7 + \beta_8\chi_8 + \beta_9\chi_9 + \beta_{10}\chi_{10} + \beta_{11}\chi_{11} \quad (4.3)$$

Where

θ = Probability of contracting a loan

$1(\chi)$ = those who have contracted a loan

$0(\chi)$ = those who have not contracted any loan

$\beta_{1,...,6}$ = the coefficient of the each predictor variables

$\chi_{1,...,6}$ = Independent variables are:

χ_1 = gender of household head, χ_2 = age of household head, χ_3 = size of the household, χ_4 =education level of household head, χ_5 =savings and χ_6 = total income of the households.

The results of the estimation are presented in Table 4.39.

Table 4.39. Determinants of Loans – Logistic Model

	Coefficient	Std. Error	Z	P(z)
Gender	1.0292	0.9878	1.37	0.1700
Age	0.0105	-1.1600	0.25	0.9670
Household size	1.213***	0.0798	2.94	0.0030
Education	0.5136*	0.1842	-1.86	0.0630
Savings	1.4436	0.4395	1.21	0.2280
Income	1.0003 ***	0.0001	3.29	0.0010

Notes: Number of obs = 499, LR chi2(6) = 37.62, Prob> chi2 = 0.0000, Log likelihood = -225.52997
Pseudo R2 = 0.0770

*significant at 10% level, **significant at 5% level, ***significant at 1% level

Our regression results show that there are three variables that have significant effect on the odds of contracting a loan namely income, education and household size. The higher is the level of income of a household, the higher is his probability of contracting a loan. Similarly, level of education is also found to be positively correlated with the odds of contracting a loan. However, our results also found a positive correlation between household size and the probability of contracting a loan. An increase in the unit of household unit will lead to an increase in the odds of contracting a loan by 1.213. As for age, gender and savings they are found to be statistically not significant.

Together these findings may imply that access to a credit market may not be a viable way for the rural households to mitigate a negative risk. Their low level of income has in a way limited their access to formal credit market. Even though, loans can be obtained from family members or friends, such alternative may not be functional in the occurrence of a co-variant shock.

4.4.3. Community Support and Solidarity

Another form of risk coping mechanism is community support. Even though such mechanism is considered by some authors such as Fafchamps and Lund (2003) as non-sufficient, it still constitutes a major source of help especially within the context of rural community. In this study, we tried to gauge the extent to which rural community in Peninsular can rely on their neighbours and friends in case of a problem.

Based on our findings on the types of strategies used by households faced with a risk, we can see that in case of a shock, rural households in Peninsular to a certain extent can still rely on their family members and friends. As shown in Table 4.16 above, 17.1 percent of the respondents coped with the risk that they faced by borrowing from other family members while 5.0 percent borrowed from borrowing from friends or neighbours (5.0 percent).

We have also asked the respondents in our survey whether they can rely on the society in case of a problem. A total of 395 respondents or almost 80 percent of the total households surveyed have responded positively to the question (Table 4.40). As to the question, from whom would they borrow money in case of a problem, Table 4.4.2 shows that family members and neighbours are two of the three most cited answers with 73.3 percent said that they will borrow from a family member and 21 percent from neighbours. Bank is another major source of borrowing cited by the respondents.

**Table 4.40. Support from Society
in Case of Problems**

	Frequency	Percent
Yes	395	79.2
No	104	20.8
Total	499	100.0

Table 4.41. Sources of Loans in Case of Problems

	Frequency	Percent
Family	366	73.3
Banks	138	27.7
Neighbours	105	21
Nobody	52	10.4
Association	37	7.4
Friends	31	6.2
Shop owners	20	4
Micro-Credit	12	2.4

Together these findings indicate that solidarity and support from the community is still very much present in rural Peninsular Malaysia. Households in rural Peninsular Malaysia would still be able to count on their family members and friends for support in case of a problem. But the issue is will the same level of support still be present in the future.

4.4.4. The Role of the Government

The government has also a role to play in providing help and support to those who are faced with a risk. Indeed, government has been identified in the literature as one of the main arrangement that can be used by households to cope with a risk (Holzmann and Jorgensen, 1999 and Holzmann, 2001). In the case of Malaysia, as discussed earlier in the introduction, the government does provide several programs that are aimed towards assisting those who are faced with an adverse shock.

Our respondents seem to agree on the role of government in providing assistance to those in need. As shown in Table 4.42, almost 98 percent of the respondents agreed to the question that the government should provide assistance. This shows that rural households in Peninsular Malaysia still view social assistance as one of the roles of the government.

Table 4.42. Should the Government Provide Assistance

	Frequency	Percent
Yes	485	97.2
No	14	2.8
Total	499	100.0

Table 4.41 summarizes the types of assistance that the government should provide according to our respondents. According to the International Social Security Association (ISSA), there are three pillars in the social protection program that comprises of a first pillar of general, safety net income protection provided by the government, a second or social insurance pillar comprising mandatory contributions and a third, voluntary, private insurance pillar supplement the other two. Based on this categorization of social security program, we can see that the government has a role to play in the first two pillars. In the first pillar, the government would provide assistance to those who are in dire financial needs such as the poor, the long-term unemployed, single mothers or people with disabilities. In the second pillar, it is the individuals themselves who would contribute a portion of their income into individual or personal accounts for future income protection. However, the government has also a role to play by supplementing the funds and by administering the funds.

According to the ISSA, in order for a social security system to be considered as comprehensive, it must provide protection against the following four types of contingencies

- i. Old-age, disability and survivors
- ii. Ill-health and frailty,
- iii. Unemployment
- iv. Maternity and Child-rearing

As for the International Labour Organisation (ILO), a comprehensive social security system as one that provides assistance or benefits to the following risks and needs: -

- i. Old- age
- ii. Survivor
- iii. Invalidity
- iv. Employment injury
- v. Sickness and health
- vi. Family
- vii. Unemployment
- viii. Housing
- ix. Public assistance and others

In our study, we have sought the opinions of our respondents as to what types of assistance program that they believe should be provided by the government. We have listed six types of programs based on the categories listed by the ISSA and the ILO as well as based on the specificity of the Malaysian case. The six assistance programs are health, old age, family, housing, poverty and employment. The results of our findings are summarized in Table 4.43. As

can be seen, there are two types of contingencies for which the majority of our respondents believe there is a role for the government to play namely poverty and health. For 64.5 percent of the respondents, the government should provide assistance to those who are poor while approximately 53 percent of the respondents mentioned health as an area where the government should provide assistance. As for the other four types of programs, less than half of the respondents think that government should provide any assistance for these kinds of risk. For example, only 29.7 percent said that the government should provide assistance for family-related problem and 37.3 percent mentioned that the government should provide assistance for housing issue.

Table 4.43. Type of Government Assistance

	Frequency	Percent
Health	263	52.7
Old-Age	224	44.9
Family	148	29.7
Housing	186	37.3
Poverty	322	64.5
Employment	198	39.7

We have also asked the respondents to what extent they believe that the government has played their role in providing assistance to those in need. Apparently, there is still a lot of room for improvement as far as the government role in social assistance is concerned as only 54.9 percent of the respondents agreed that the program provided by the government is sufficient (Table 4.44).

Table 4.44. Sufficiency of Government

Programme		
	Frequency	Percent
Yes	274	54.9
No	225	45.1
Total	499	100.0

Another issue that should be given proper consideration is accessibility. The government should not only provide the programs but must also make sure that those who are in need of these programs know how and where to obtain them from. This is especially the case for those who live in remote rural areas. In our study, we have elicited the view of our respondents on this issue by asking them whether they know how to obtain government's assistance. Almost 60 percent of the households surveyed responded in the positive. This implies that, as far as rural Malaysia is concerned, quite a substantial proportion of the population still does not know how and where to obtain assistance from the government. Therefore, the government may have to implement more program that not only increase public awareness of the various programs available but also to educate them on how and where they can obtain this assistance. However, it should be noted that in recent years, the government has implemented various strategies in order to spread the reach of its assistance program wider. For example, in 2007, through its e-Kasih program, the government has conducted a survey (Banci Isi Rumah Miskin or BIRM) through a collaboration of several government agencies such as the Ministry of Information, The Department of Statistics and the Department of Social Welfare to ensure that all poor households are accounted for and receive all the assistance that they should obtain.

Table 4.45. Knowledge on Obtaining Government Assistance

	Frequency	Percent
Yes	283	56.7
No	216	43.3
Total	499	100.0

It can be assumed that level of income is one of the most important factors that influence whether a household knows how to obtain assistance from the government or not. Indeed as can be seen from Table 4.46, more than 70.7 percent of those earning less RM500.00 and 54.7 percent of those earning between RM500-RM1000.00 does not know how to obtain assistance from the government. And as we move higher up the income ladder, we can see that most of the households in this group have the knowledge in getting assistance from the government. However, for those in the highest income bracket, we can see that most of them are not aware how to obtain this help. This is simply due to the fact they do not need such help.

Table 4.46. Income Group and Knowledge on Obtaining Government Assistance

Income Group	Know how to obtain assistance				Total
	Yes		No		
	Frequency	Percent	Frequency	Percent	
0-499	17	29.3	41	70.7	58
500-999	62	45.3	75	54.7	137
1000-1999	124	64.6	68	35.4	192
2000-2999	40	76.9	12	23.1	52
3000-3999	24	66.7	12	33.3	36
4000-4999	14	77.8	4	22.2	18
5000-10000	2	50.0	2	50.0	4
>10000	0	0.0	2	100.0	2
	283	56.7	216	43.3	499

Besides income, age is another factor that should also determine the knowledge on getting assistance from government. Table 4.47 shows that there are two groups of age group that seem to be less knowledgeable on getting this help – those aged less than 30 years and those aged more than 60 years. It can be assumed that the young know less about the assistance because they have little experience in dealing with the government. As for the old, they lack of knowledge is simply due to factors related to their old age.

Table 4.47. Age Group and Knowledge on Obtaining Government Assistance

Age Group	Know how to obtain assistance				Total
	Yes		No		
	Frequency	Percent	Frequency	Percent	
< 30	21	55.3	19	46.2	39
31 - 40	44	62.9	26	37.1	70
41 - 50	94	64.8	51	35.2	145
51 - 60	70	52.2	64	47.8	134
> 60	54	48.6	57	51.4	111
	283		216		499

Together our findings on the role of government show that rural households still expect the government to provide social assistance program to those who are in need. However, for most of them, the types of assistance expected are somehow limited to those related to health and poverty. Only some of them expect the government to provide a more comprehensive range of assistance similar to the ones found in developed countries. This may be due to their lack of awareness of what constitutes a comprehensive social security program. Our results also point to the issue of accessibility, which is still prevalent despite the various efforts undertaken by the government in recent years. It is also found that it is those who are in need of assistance who seem to be left out from the system. As such, more effort should be taken to reach this group of people.

4.5. FUTURE RISK AND COPING MECHANISM

In this section, we will examine how would rural households view the future in term of risk that they may face and how would they cope with this risk. We have asked the respondents what are the types of risk that may have a significant impact on their livelihood and what would be the mechanism that they will deploy in order to cope with the risk.

Table 4.48 shows that job loss is the most cited risk by the respondents with almost 44 percent respondents. Other risks that have been cited the most are working member of household falling sick (39.3 percent), death of a working member of household (36.3 percent) and reduction in salary (23.9 percent). As we can see here, all of these risks are related to employment and it can assumed that theses risks are most feared by our respondents as they will have a direct impact on their income as well as their livelihood. The other major risks that have been cited quite often are sickness of a household member (16.8 percent), accident met by a working member of households (15.8 percent), flooding (15.8 percent) and theft/burglary (14.0 percent).

Table 4.48. Type of Potential Future Risks

Types of risk	Frequency	Percent
Job loss	218	43.7
Working household member felt sick	196	39.3
Death of working household member	181	36.3
Salary reduced	119	23.9
Household member felt sick	84	16.8
Working household member accident	79	15.8
Flood	79	15.8
Theft/Burglary	70	14.0
Death of household member	68	13.6
Fire	60	12.0
Crops destruction	51	10.2
Bankruptcy	39	7.8
Household member Accident	38	7.6
Cheatings	25	5.0
Living stocks destruction	22	4.4
Storm/Typhoon	15	3.0
Family	13	2.6
Social Ills	11	2.2
Riots	9	1.8
Landslide	7	1.4

As for the strategies that will be used to cope with the crisis mentioned above, there are two strategies that have been cited the most often by our respondents (Table 4.49). Almost 70 percent responded that they would reduce their expenditure. Another strategy that has been cited most often is saving withdrawal with 53.7 percent of the respondents. The other strategies most mentioned by the respondents are reducing food consumption (24.3 percent), borrowing from family (22.4 percent), asset liquidation (16.8 percent), getting assistance from family (14.2 percent) and obtaining assistance from the government (10.2 percent).

Together these findings imply that the respondents will try coping with the risk using whatever resources they have in hand first. In our case, the respondents would reduce their expenditure or withdraw their savings first. And if they have to seek assistance from a third party, most of them prefer to approach their family members first before they would get help from the government. Only a few of the respondents would seek help from a friend (2.8 percent) or from an association (2.6 percent).

It also noteworthy that asset liquidation as a coping mechanism is preferred by only 16.8 percent of the respondents. This may signify that asset ownership is still very low among rural households. It could also mean that even though these households possess some asset, they don't think that they would be able to liquidate this asset to cope with a future risk for various reasons such as high dependency on the asset for their livelihood, low liquidity of the asset or lack of market for the asset.

Table 4.49. Risk Coping Mechanism for Future Risk

Strategy	Frequency	Percent
Reduce Expenditure	347	69.5
Withdraw Savings	268	53.7
Reduce Food	121	24.3
Borrow from family	112	22.4
Liquidate Asset	84	16.8
Assistance from family	71	14.2
Assistance from Government	51	10.2
Additional work	43	8.6
Send spouse to work	25	5.0
Borrow from banks	21	4.2
Do nothing	21	4.2
Pawn Gold/Jewellery	20	4.0
Assistance from friends/neighbours	14	2.8
Borrow from friends/neighbours`	14	2.8
Assistance from Associations	13	2.6
Assistance from Political Parties	9	1.8
Send Children to work	6	1.2
Move to another place	4	0.8
Assistance from the public	3	0.6

Our survey also shows the relatively low number of households who would rely on assistance from the government to help them face an adverse shock. This is in contrast to our findings regarding the view of the respondents on the role that government should play in providing assistance to those in need. Together, these may signify that even though rural households believe that the government should play a bigger role in the case of a shock, they have actually little confidence of obtaining government's assistance. Therefore, they would rather rely on a

“surer” alternative to cope with the shock. In other words, there is a mismatch between what the public experiences in term of government assistance and what is aspired by them. This also implies that the government has still a lot of room to improve their social assistance services to match what is aspired by the public.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

In this concluding chapter, we will first present the main findings of the study. We will then discuss the policy implications that can be derived from the study. Finally, some areas of further research will be suggested.

5.1. CONCLUSION OF THE STUDY

The main objective of this study is to provide an understanding on the exposure to risk of rural households in Malaysia. We also examine how these households would react when faced with a risk. The findings of this study are very crucial as they can contribute towards a better understanding of the relationship among risk, vulnerability and poverty within the context of rural Malaysia. Indeed, Malaysia has done remarkably well in eradicating the problem of poverty among its population. However, recent literature has shown that poverty should not simply be tackled from a static perspective. There is a dynamic dimension to the problem that needs to be dealt with as well. And by examining the level of risk exposure of rural households and the way they manage this risk, we would be able to have some measure of how vulnerable are these households. Furthermore, based on our understanding of this issue, we should be able to see where the government or any other relevant parties should intervene in order to reduce the vulnerability of these households in particular and the population in general.

Our study found that rural households face a number of risks in their daily life. Of the total households surveyed for this study, 40 percent have had to deal with at least an adverse shock. Flooding is the shock that affected the highest number of respondents with 59 respondents or 11.8 percent of the total respondents. Other types of shocks that have a relatively higher number of occurrences are reduction in salary (8.4 percent), working member of households falling ill (8.2 percent), member of households falling ill (8.0 percent), destruction of crops (5.6 percent) and theft/burglary (5.0 percent). As can be seen, the types of risks faced are both idiosyncratic and covariance in nature.

A more important issue that needs to be examined is how do these households manage or cope with the risks that they face. Without an effective risk management strategy, the risk may have a severe impact on the livelihood of the households. Our study found that most of the rural households in Peninsular Malaysia have deployed at least one strategy in order to deal with a risk. Among the strategies that have been most employed by the respondents are reducing expenditure with more than 58 percent of those who are faced with a shock using it as a coping mechanism, withdrawal of savings (35.7 percent), borrowing from other family members (17.1 percent), reducing food consumption (12.1 percent) and getting assistance from the government (11.6 percent). Other strategies that are also being used by the respondents are liquidating asset (9.5 percent), getting help from other family members (9.0 percent), getting additional jobs (7.0 percent), borrowing from friends or neighbours (5.0 percent), pawning jewellery/gold (4.5 percent) and obtaining a loan from banks (4.0 percent). It is noteworthy that a relatively high percentage of the respondents (20.6 percent) have chosen to do nothing when a faced with a

shock which may imply that these households have nothing that they can employ as coping mechanism.

Nevertheless, not all these strategies have been effective. Our findings show that only 40 percent of the respondents who have faced a crisis have recovered from. Another 60 percent of the respondents are yet to exit from the crisis with 36.7 percent of respondents who have partially recovered from the shock and 26.1 percent who have experienced no recovery at all. This implies that for most of those affected by a shock, the strategies used by them are not very effective in order to bring them out from the crisis.

Our study also found size of household, savings and income level to have a significant effect on the probability of exiting from a crisis namely. It is found that the odds of exiting from a crisis are higher for bigger households, for households with savings as compared to those who don't have any and for richer households.

Our findings also show that the majority of rural households would not be able to rely solely on their savings and assets as a coping mechanism when faced with a negative shock. Most of them have very little or no savings at all which is due in particular to their low level of income. It is also found that age and level of education also determine the saving decision of a household.

As for the role of the credit market, our study found that it might not be a viable way for the rural households to mitigate a negative risk. Their low level of income has in a way limited their access to formal credit market. Even though, loans can be obtained from family members or friends, such alternative may not be functional in the occurrence of a co-variant shock.

This study also points to the fact that solidarity and support from the community is still very much present in rural Peninsular Malaysia. Households in rural Peninsular Malaysia would still be able to count on their family members and friends for support in case of a problem. But the issue is will the same level of support still be present in the future.

As for the role of government, our findings show that rural households still expect the government to provide social assistance program to those who are in need. Our results also point to the issue of accessibility, which is still prevalent despite the various efforts undertaken by the government in recent years. It is also found that it is those who are in need of assistance who seem to be left out from the system.

Finally, based on the findings of this study, there are several factors that should be considered in determining the level of vulnerability of a household to poverty. It should be noted here that it is not the risk itself that determine whether a household is vulnerable or not. Rather it is a matter of whether this household dispose of an effective risk coping mechanism or not and whether the household will be able to deploy these strategies or not. And based on the findings of this study, these two factors are found to be determined by level of income, savings, asset holdings and

household size. In other words, vulnerable rural households are those who have relatively low level of income, no savings, no asset and small household size. However, further study is needed in order to conceptualise the major aspects that could contribute towards the vulnerability of households. This study only looks at the aspects of how these households manage risks and what strategies are used. However, the choice of strategy may also depend on a lot of other factors. Therefore, a better understanding of the reasons behind this choice could also enhance our understanding on the vulnerability of a household.

5.2. POLICY IMPLICATIONS.

The following are the policy implications that can be derived from this study: -

1. It is found in this study that rural households are not equal in term of their capacity to deal with an adverse shock. Some of them are more severely affected by a shock due to non-effectiveness and in some cases non-existent of a risk coping strategy. Therefore, it can be assumed that there is a high probability for these households especially those whose income is barely above the poverty line income, to fall into the poverty trap. As such, the government should re-examine its poverty eradication program in order to include not only those who are already but also those who are vulnerable to become poor because of a lack of effective risk coping mechanism.
2. Our study found that besides income, saving is another main factor that determines the capacity for a household to exit from an adverse shock. In other words, saving can be considered as an effective risk coping mechanism within the context of rural Malaysia. However, our findings also point to the fact most rural households have little or

insufficient savings that they could employ when faced with a shock. Even though our study has not examined the effectiveness of asset holding as a coping mechanism, it is not farfetched to assume that households who are well endowed in asset should be able to better cope with an adverse shock. Together, these findings underlie the importance for households to increase their savings as well as their asset holdings that can be put into use in case of a crisis. Therefore, the government should come up with programs that would promote saving and asset building among households. The government should also include in its poverty eradication strategies, programs such as saving matches that would increase the incentives for the poor and the low-income earners to increase their savings and asset.

3. The findings of this study show that the mechanisms employed by most of the rural households are not sufficient for them to cope effectively with an adverse risk and this has then led to a severe impact on their livelihood and well being. There is thus clearly a role for the government to play by providing assistance programs that could help these households to better cope with an adverse shock. The government or any other relevant authorities should thus re-examine the current social security system in this country as studies have shown that the protection offered by our social security system is far from sufficient (see for example Ragayah et al, 2002). Among the improvement that could be brought to the current social security program is an increase in its coverage to include those who are not employed (such as housewives, children or the elderly) as well those who are employed in the informal sector. The government may also want to increase the types of risks covered by our social security program to include other risks such as the

ones related to family, survival and sickness and health. There is also a need for the government to re-examine the quantum of assistance given to match current reality and needs.

4. In improving the social security system of the country, the government may not necessarily have to foot all the bills by itself, as this may not be fiscally sustainable in the future. Several programs should be crafted in such a way that both the government and the beneficiaries would contribute financially to the system.
5. Not only that the government needs to improve the programs provided, it also needs to ensure that those who are entitled to benefit from these programs would be able to obtain them. In other words, the government needs to increase the awareness of the public especially those in remote areas of the existence of its assistance programs in order to widen the reach of these programs. Accessibility to these programs could also be improved by making it easier for those who are eligible to apply for such mechanism. However, the government should also have a good filter mechanism to ensure that only those who are truly eligible will benefit from the program.
6. This study has also showed that the level of solidarity is still very high among rural communities in Peninsular Malaysia. However, such solidarity may be eroded in the future especially with the increase in the level of development. Therefore, there is a need for the government to continuously educate the public especially the younger generation on the importance of filial and social solidarity.

7. As far as vulnerability to poverty indicator is concerned, the findings of this study point to income, savings, asset holding as well as household member as the main variables that should be taken into consideration. The government should therefore include these variables in determining which types of households that should be assisted in case of a crisis.

5.3. SUGGESTIONS FOR FURTHER RESEARCH

The following are some of the studies that could be done in the future

1. A study on the factors that determine risk coping strategies by households.
2. An analysis of the dynamics between poverty and vulnerability on a more focused group of households that combine both quantitative and qualitative approach.
3. An analysis on the impacts of risk and vulnerability on the productive capacity of households
4. An analysis on the effects of government assistance on the behaviours of households especially with regard to risk-taking activities.
5. An analysis using consumption as a measure of impact of risk and vulnerability indicator

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