

CHAPTER 2

LITERATURE REVIEW

Our literature review is established as a sequence of past researches and studies published on risk attitude of households in different parts of the world in general and in Ethiopia in particular. One of the purposes of literature reviews is to add new knowledge and ideas to the existing literature based on new approaches and findings. Our study appreciates similar studies carried out by Akay et al. (2012) and Yesuf & Bluffstone (2008) in the northern part of Ethiopia. We have studied them carefully to compare and contrast with our results, though the region has quite different geographic and ethnographic features from the southern part of Ethiopia where our study is based.

This chapter is categorized into sections and subsections to supply additional information on the basic knowledge of risk concepts, attitudes and how it is perceived and interpreted over time. It briefly explains and underpins how the risk attitude develops into the risk behavior of the individuals.

The extensive literature review explicitly demonstrates a synopsis look on the general trends of the studies. It compares the similarities and contradictions of reports that have been discussed by many researchers on the topic under discussion. It is also interesting to touch on the new developments of technology and social exposure that are making substantial impact on rural livelihood. Our literature would like to pay a special focus on trust as an independent variable to figure out and extend its importance on risk attitude.

2.1 Risk

2.1.1 The Concepts of Risk

There is no conventional way of defining risk. However, it can be expressed as the degree of uncertainty that one feels when a new development is created. Nevertheless, many researchers have their own way of explaining it, since risk as a term has no literal meaning that combines the different expressions into one concept. For example Stiglitz (1979) said that risk is just like love. It is an academic explanation that

anyone who feels uncertainty may be confronted with risky decisions. However, there is less probability that those feelings are expressed and interpreted accurately. There is another economic expression emerged from the concept of risk aversion behavior where individuals with low risk taking behavior will be willing to pay higher in order to avoid the risk. Dillon and Scandizzo (1978) reported that risk should not be perceived as an absolute term to assess a certain situation where many factors are involved and evolved within it. The argument considers ambiguity to a certain level. However, the study suggested that it can be explained by risk aversion analysis. On a different perspective, in order to say that risk exists, it should be determined by examining and understanding the probable outcome of a study. One is the uncertainty that one faces from the possible outcomes of an experiment, and the second is the necessity of the outcome that one expects from the experiment (Holton, 2004). He elaborated his report in a way that if a person leaves a plane without parachute, it is certain that he is going to die. This tells us that no risk decision is posed at the moment, the person is sure to die. Similarly, if someone has to toss a coin, there is no risky choice before him, because the outcome probability will not affect his wellbeing or wealth at all, if money is not involved in the game. However, Holton did not forget to mention that if monetary incentives are involved the whole situation is changed into a risky choice. The idea summarizes that risk exists when there is uncertainty with certain objectives or consequences for that matter. In either way, the above-mentioned perspectives remind us that risk can be defined in many ways based on a given context.

Hence if the term risk remains controversial, with no consensus on its literal meaning, it can be defined according to the nature and objectives of the study. This is important to properly perceive the risk dilemma where individuals are usually challenged with, so that functioning strategies can be suitably adopted to minimize hazardous impacts. Next we are going to discover how risk attitude is described according to personal and societal experiences. We shall also see how risk attitude evolves and why agricultural organizations, governments and nongovernmental organizations should study risk attitude at household level.

2.1.2 Risk Attitude

Given the aforementioned backgrounds and concepts, risk attitude is best defined as ‘chosen response to perception of significant uncertainty’ (Hillson & Murray-Webster, 2004). Farmers with different development backgrounds have different perception of their environment and the cycle of social interactions that goes around them.

Households in many different regions may share the same fate too. For example, they might be exposed to natural shocks like drought, flooding and earthquake. But their reaction and approach to the risk may differ due to their previous knowledge by maintaining the prevention practices that actually minimize the vulnerability. The prevention management may include ensuring access to credit, savings and government aid to bear the consequences. Some households invest in less risky areas but with low returns. Others look for help from families and close friends. Scientists believe the reactions and measures taken against the risky situation over a long period of time develop to behavior that eventually is molded into a practiced culture. In the same way, one can say that if a new technology is to be introduced to a certain area, individuals may exhibit different attitudes. Some of them might adopt the technology fast and others may adopt it slowly. This difference arises due to multiple socio-economic factors that a farmer had experienced before or it could be due to the perceived consequence of the technology. The study in Thailand and Vietnam conducted by Gloede, Menkhoff, and Waibel (2013) concluded that poverty made households develop risk aversion attitude where an economic opportunity with higher return would be less likely to be utilized. Many rural households in Ethiopia are illiterate. Besides, they have less access to information technology through which they can learn the merits and demerits of a technology. As a result, farmers are reluctant to utilize it out of the fear of the assumed negative impacts. Therefore, lack of adequate knowledge and financial shortages are the main source of risk aversion attitude of rural households.

Behavior is one of the key indicators of an established attitude that individuals show during the uncertain situation with risky choices. It could be optimistic or pessimistic with a certain degree of revelation. If a new technology is perceived to have a positive impact on the household, the general assessment would be carried out about

the technology to decide whether to adopt it or not. But if the new technology is believed to cause a great deal of impact in the household, the behavior of the individuals react directly to the belief without being affected by the attitude. Once the result of the technology is conceived, individuals have no reason to think on how to influence or determine the result, they can only react accordingly.

Hence according to their risk attitudes, individuals can be categorized as risk averse or risk seekers. The next section is going to discuss on these concepts simultaneously.

2.1.2.1 Risk aversion and Risk Seeking

Agriculture is one of the risky enterprises that one in three of the world population is employed to make a living. It has been continuously challenged by climate change (rainfall pattern shifting, temperature increase, heavy rain storms), financial constraints for investment operation, accessible infrastructures to transport products, lack of critical inputs such as fertilizers, sufficient water sources and land degradation. As a result, farmers are required to prepare for the worst case scenario before a total failure can happen (Mold, 2009). One way to curb the challenge is to assess and investigate farmers' behavior and attitude toward the changes. Farmers in developing countries are sensitive to shocks like flooding, market failure, price volatility and drought in their environment. Some farmers are able to insulate themselves from the shocks by selling their assets, through precautionary savings and reducing consumptions. However, the poor farmers are prone to the crisis and as a result prevalent shocks cause them to develop risk aversion behavior. Subsequently, farmers become less productive, prone to persistent poverty and slow growth. In order to minimize the anticipated risks, experimental studies are crucial to examine farmers' risk attitude and risk decisions so that policies and rules are drafted to minimize the negative impacts and protect the disadvantaged farmers. For example, the decoupled direct payment policy in European Union indicates that farmer's risk aversion attitude decreases as the wealth of the farmers' increases (Conforti, 2005). In Uasin Gishu County (Kenya), a study reports that a policy that promotes off-farm investment reduces agricultural risks. The study further claims that off-farm diversification improves

farmers' total welfare by strengthening the resilience and offsetting the incomes collected from the seasonal agriculture (Korir, 2011).

By and large, farmers in developing countries demonstrate a risk aversion attitude when they are asked about their willingness to take risk in general (Mold, 2009). Gloede et al. (2013) and his co-workers found out that farmers in rural areas of Thailand and Vietnam show risk aversion attitude. The study emphasized that the farmers cannot afford the estimated loss from the risky situation. For example the households are unable to adopt the new technology, as it has multiple risks, starting from its initial investment to the expenses of operation and maintenance. Similarly Yesuf & Bluffstone (2008) conducted an experimental study in the northern part of Ethiopia to investigate the risk aversion attitude of the Ethiopian households. The results show that most of the farmers exhibit risk aversion attitude. The frequent drought and erratic rainfall shocks are the reasons behind the risk aversion attitude of the households. The policy recommendation includes development of micro credits and insurance markets to support the farmers. There should be access to micro credits to fund the creation and expansion of the microenterprises that increase household income in the long run. On the other hand Indian cotton farmers tend to show a risk seeking behavior when they are asked to play the lottery game for better cotton yield from their farm land (Maertens, Chari, & Just, 2014). They reveal strong risk seeking attitude due to the higher income expectations out of the single plot of land. The value of the payoffs is enough to cover the farmer's annual expenses. Hence majority of the farmers preferred the riskier game. The above scientific evidences explain that farmers from different regions evince different risk attitudes because of their socio-economic variability, farm characteristics as well as the higher outcome prospects. However most of the farmers in developing countries exhibit risk aversion attitude that implies non inclusive economic development.

Many studies and researches focus more on the evaluation of individual attitude toward risk rather than on risk perceptions due to the growing concern of risk aversion behavior in farmers (Cao, Carpentier, Gohin, & others, 2011). It is essential to keep track with the existing commitment to measure individual's attitude toward the risky situation and thus understand the determinants of risk decision at the household level.

Besides the results of risk preference enables policy makers to formulate priorities that serve the majority. In addition, it helps the extension service agents to trace the most disadvantaged farmers that need immediate support from the government. Agricultural industries can also refer to them to provide farmers with production factors, and assistances to achieve their goals. Agricultural industries produce large amounts of fertilizers, new breeds of crops that can be shipped to targeted farmers and rural people. However to reach the targeted destination, it is necessary to follow scientific studies for effective delivery. Hence, individual risk-taking attitude studies offer the best guidelines to the service (Cao et al., 2011).

But to comprehend how the risk averse and risk loving attitude of the individuals evolve and influenced by many socio-economic and political dimensions can be graphically demonstrated using a conceptual framework. However before we proceed directly with the conceptual framework, it is important to explain the common risk management measures for agricultural protection and the farm management activities in Ethiopia. The Ethiopian farm management practices give us a glimpse of seasonal planting, growing and harvesting staple crops and other types of food crops that the Ethiopian farmers produce in the southern region.

2.2 Risk Management for Agricultural Protection

Climate change is one of the biggest challenges of agriculture in developing countries. It is also one of the highly debatable issues in the mainstream scientific organization worldwide. Its unpredictability and uncertainty impacts on the economic and social crises are the worst part of it. As a result, producers and government agents are always alerted to protect the basic agricultural assets of the country. Risk management is one of the widely practiced measures to protect or mitigate the risk posed by the effect of the climate change. However, risk management can be the ultimate goal of profit maximization in agricultural sectors (Moschini & Hennessy, 2001). Two fundamental measures can be adopted to protect agricultural production. An individual can be self-insured to reduce the impact of the harvest loss from the damage. This is actually the risk mitigation measure which should be taken as an initial step to complete protection of production. The use of agricultural technologies (drip or sprinkler irrigation) during dry periods complete the crop water requirement of plants,

thereby reducing the production loss that may have been occurred due to rain fall shortages.

Crop diversification is another risk management strategy commonly practiced by farmers. Crop diversification is an efficient strategy to mitigate shocks if the farmers are well informed about its impact on the outcome. For example crop diversification reduces the breeding of plant pests and pathogens transmission by developing the ability to reduce their population and their parasitic damage (Lin, 2011). Monocultures are susceptible to pest outbreak and the expansion of plant diseases under variable climate changes. Crop diversity does not only increase production, it also promotes biodiversity (Matson, Parton, Power, & Swift, 1997). The abundance of different plant species provides an ecosystem to different animal species where many of the species are apparently natural enemies of the plant parasites which reduce their population whereby minimizing the impact on the crop yield. Apparently production diversification requires more input equipment while minimizing the risk from the shocks. The cost decreases the potential net-income from the farm. Therefore, still there are risks from the diversification practices but risk averse farmers will prefer lower net-income activities to avoid the risk. But the risk-taking farmers will not accept the lower income approach because their primary goal is to attain maximum profit. In any case, crop diversification is cost-effective and environmentally safe strategy with positive welfare effect at the end. Off-farm income, leasing land and livestock, crop stocks and financial reserves are other risk mitigation measures recommended to farmers.

The second risk management strategy is the self-protection. Producers take the decision to protect their assets before the actual damage can happen to their property. Economic risks such as harvest failure, unemployment, price fluctuations and food stock depletion are idiosyncratic risks that regularly challenge the rural people (Fafchamps, 2003). Most of the time households react to the risks through informal mechanisms. For example, farmers can migrate temporarily during extreme drought and flooding weather forecasts. Drought and flooding are the main causes of livestock mortality and harvest failure in rural areas. Therefore, farmers usually migrate to protect their animals to places where they can find water and shelter for their animals. Besides, farmers in developing countries can take loans from financial institutions, they can

switch their conventional seeds to other resistant varieties and they usually look for government aids to cope with the shock damages (For a recent overview see; Kahan, 2013). All these measures provide the farmers the opportunity to respond to the shocks that may pose maximum risks.

Farmers in rural Ethiopia have similar experiences when it comes to the effect of shocks and the risks that face them during adverse weather conditions. The next section hosts the farm management system in Ethiopia.

2.3 Farm Management in Ethiopia

The southern part of Ethiopia practices mixed crop-livestock farming system. Cattle are considered as the central figure of wealth in the region. The households use cattle for draught power and production of manure out of their waste product to improve soil fertility (Elias, Morse, & Belshaw, 1998). Cereals, root crops and vegetables are the main crops cultivated in the southern region of Ethiopia. Farmers use small quantities of the crops in the farm land for the purpose of diverse production. The households use alternating cropping system for annual production. For example, if maize (*Zea mays*) is cultivated in Belg³ season, sweet potato or teff (*Eragrostis abssinica*) is planted in Meher⁴ season. There are two seasonal cropping in Ethiopia. The first seasonal crops are planted in March, and the second planting takes place in July/August and harvesting is carried out in June and October respectively. Figure1 summarizes seasonal crop calendar in Ethiopia.

In the southern part of Ethiopia, fallow periods are ultimately occupied by taro and sweet potato plants. During, the dry season the land becomes so hard to break using hoeing. Besides, it requires substantial quantities of manure to improve soil productivity. However farmers plant taro and sweet potato to help them break the new fallow (Elias et al., 1998). Nowadays cassava is grown in the lowland areas of the southern Ethiopia. It is easily adopted by the farmers because it is highly productive, tolerant of poor soils, periods of drought and pest resistant. The household believe cassava helps in reducing food insecurity within the community.

³ Belg is an Ethiopian local name for spring season.

⁴ Meher is an Ethiopian local name for summer season.

Nevertheless, soil fertility deprivation, land farm shortages, erratic rainfall as well as the scarcity of draught oxen remains a big concern for the farmers. The communities have been affected by the lack of sustainable agricultural productions due to climate change that complicates crop planting time. Some of them are even complaining that the yield is not enough to meet the subsistence need of the household. In 1970s and 1980s a study was conducted by Wollamu Agricultural Development Unit (WADU) and Ministry of Agriculture of Ethiopia to test the soil fertility problem. The result shows that there was significant difference on the yield between the fertilizers added plots and the plots which are left without fertilizers (Elias et al., 1998). Inappropriate land use, poor management and input constraints usually lead to soil erosion and loss of vegetation that eventually causes low agricultural yields. In Africa the root causes of lower production of food per capita is believed to be soil-fertility depletion. Hence investing in soil.

The above mentioned concept of the household's farm management in the southern part of Ethiopia reflects the background of the subjects in our study. The response of the subjects to the general risk question can be associated with the aforementioned farm attributes. The next section discovers how the risk attitude of households develops. And what are the main factors that cause households to make a risk preference decision.

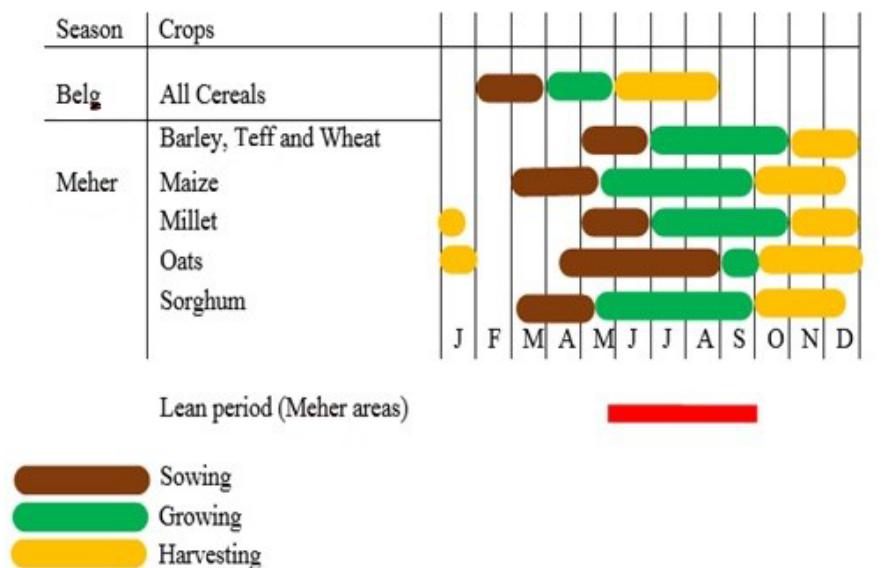


Figure 1 Seasonality in Ethiopia; Crop calendar Source: Rösel (2015)