

Review on Smallholders Farm Risk and Management Strategies in Ethiopia

Ejigu Mulatu Helamo

South Agricultural Research Institute, Bonga Agricultural Research Center: Bonga, Ethiopia

Abstract

Agriculture is the main driver for Ethiopia's growth and long-term food security as it contributes high share to GDP growth. However, farming is exceptional risky sector where; the operators faced with risk due to many factors that affect the decisions which cannot be predicted with exact accuracy. Agriculture is challenged by input and output price variability, high financial risks, weather shocks, such as floods, drought, or cold weather, human and animal health problem. Risk management in the country has become increasingly important in all aspects of the agricultural sector, to reduce the probability of an unfavorable event occurrence and adverse consequences to the farm households. Farm households used different coping strategies depending on type of risk they encounter. Risk management strategies were more dominantly based on ex-post risk Strategies than ex-ante risk Strategies, as most of them done for recovery purpose after occurrence of shocks. Use of irrigation, soil and water conservation, income and farm enterprise diversification, insecticide and pesticide use, sale of productive assets like livestock, migration to other better areas, reduction of meals taken per day, and planting of early and drought resistant crop were some of major coping strategies farmers use in Ethiopia.

Keywords: Agriculture, Coping strategies, Ethiopia, Risks, Smallholder

INTRODUCTION

Farming is unique risky sector where; the operators live with risk due to many factors that affect the decisions which cannot be predicted with exact accuracy. Agriculture is not only challenged by input and output price variability, but it also shares high financial risks occurring due to the distinctiveness of the production cycle. Moreover, agricultural producers have to worry about risks associated with negative outcomes mainly deriving from extreme weather shocks, such as floods, drought, or cold weather. Undoubtedly, climatic and biological events normally hit the overall farming population of a certain area and this has serious implications in how to deal with agricultural production and related risks (Antonaci et al., 2014).

Crop and livestock performance depend weather conditions rainfall or drought, occurrence of pests and diseases which may lead to high or low yields. Smallholder farmers who borrow money at high interest may face lower than expected prices, combined with low yields, can suffer from debt repayment difficulty and even may lead to the sale of the farm and other fixed assets like livestock. Human risk caused by illness or death and labor migration, away from rural areas can cause labor shortages for the farm. Political and social unrest can also limit labour availability (Kahan, 2008).

Early in the cropping season farmers must make decisions about what crops to plant, and what seeding rates and fertilizer levels to use but, making good decisions is the hardest part of farming. Higher profits are usually linked with higher risks. These risky but potentially profitable situations need to be managed as carefully as possible. Good agricultural risk management involves anticipating potential problems and planning to reduce their detrimental effects. Good risk management decisions depend on accurate information, which, in turn, requires consistent recorded data. Good information is one of the most useful assets a farmer can have to help make rational risk management decisions.

Agriculture is the main driver for Ethiopia's growth and long-term food security as it contributes on average 44.18% share to GDP (217.53 billion birr) and 29.31% share for GDP growth from the year 2007/08 up to 2014/15 fiscal year (NBE, 2014/15). With more than 80 per cent of its population dependent on rain-fed agriculture, Ethiopia suffers from some climate-related food security challenges. Rainfall levels vary greatly by region and seen to be difficult to predict certainly. During the past six decades, droughts have occurred every three to five years, and several serious droughts, either widespread or localized, have affected millions of people. High population growth, conflict, and governance and institutional capacity issues aggravate the droughts' influences (Mansi and Richard, 2013).

Above all these factors agriculture is the backbone of the Ethiopian economy and its' people at large as struggling continuously. It is the sector where the poor are highly concentrated depending on the natural resource base for their livelihoods and well-being to survive. It is characterized by low productivity per unit of input and high risk also associated with it. Farmers manage multiple crops, livestock species, and production practices so as to manage risks and to meet their multiple objectives (IFAD, 2009). However, there is low performance of agriculture and which can be attributed to many interrelated factors, including, recurrent drought, unreliable rainfall, land degradation, scarcity and fragmentation of land, low level of improved and suitable technologies, crop pests and diseases, livestock diseases, scarcity of animal feed, and poor marketing and infrastructure. Hence,

knowledge on how farmers make decisions within the context of risks is important in defining the strategies for agricultural development (Alamerie *et al.*, 2013).

Risk management has become increasingly important in all aspects of the agricultural sector, to reduce the probability of an unfavorable event occurrence and adverse consequences. There are several strategies that farm operators can use to reduce the farm exposure to risks being classified into modern/formal and traditional risk management tools (Kahan, 2008). In reality farmers and communities respond to climatic risks by employing various risk management strategies in order to maintain a certain level of welfare. Thus, this review was conducted with the objective, to identify the major types of risks and to assess major risk management strategies used by small holder agricultural households in Ethiopia.

2. Discussion

2.1 Concepts on agricultural risk and management strategies

2.1.1. Risks in agriculture

Korir (2011) identified five sources of risks in farming; production, marketing, financial, institutional and human or personal risks. Risk types can be classified based on sources of risks are (market, production, human and personal, institutional and policy) and based on frequency and intensity of agricultural risks by three as normal, transferable and catastrophic risks. Normal risks are less frequent and less damaging which are commonly managed by farmers. Transferable risks are intensity and frequency low to high but manageable through transferring, sharing or pooling by service providers while Catastrophic risks are low or high frequency but very large losses, affecting a large area (region) or the country

Production Risk: Crop and livestock performance depend on biological processes that are affected by the weather, and by pests and diseases. Low rainfall or drought may lead to low yields. Hail or heavy rains could damage or even wipe out crops. When farmers plant seeds and fertilize their land, they do not know for certain how much rain will fall, or whether there will be a hail storm. They do not know if there will be a problem with pests or diseases. Outbreaks of pests or diseases could also cause major yield losses in crops and livestock. The resources producers incur to plough, plant, cultivate and or weed and fertilize their crops or to care for their livestock may not be well again. This is why is said to be there is risk the sector.

Farmers produce without complete certainty about what will happen to their operation. Another source of production risk is equipment. A farmer's tractor may break down during the production season resulting in an inability to harvest in time, thus affecting yields. If the farmer is using a new technology, will it perform as expected? Will it actually reduce costs and/ or increase yields? If seeds do not germinate and day old chicks die what will be the impact on production and farm family income and survival condition? The farmer can never be completely certain about the occurrence of these adverse circumstances in production season prior.

Price and cost (Market Risk): Kahan (2008) indicated that the price of farm products is influenced by the supply of a product, demand for the product, and the cost of production. Supply of agricultural product is affected by a combination of production decisions made by farmers and by the weather and other factors that influence yields. On the other hand, demand for agricultural product is affected by consumer preference, consumers' level of income, the strength of the general economy, and the supply and price of competing products. Although input costs tend to be less variable than output prices, when combined with yield variations the cost of production becomes a serious source of risk. When farmers plant crops or commit resources to raising livestock, they do not know certainly what prices they will obtain for their products.

Institutional Risk: Institutions are mechanisms that are used to structure human interactions in the presence of uncertainty, through help to reduce uncertainty and risk in human exchange. One of the situation is political risk, which is the risk associated with unfavorable policy changes. Uncertainty in decision arises due to imperfect information, inability to utilize all information available.

Institutional risk refers to unpredictable changes in the provision of services from formal and informal institutions that support farming. Part of institutional risk is the uncertainty of government policy affecting farming, such as price support and subsidies. The risks farmers face is often a result of decisions taken by policy-makers and managers that can have a major impact on the farm business.

Financial risk: Financial risk occurs when money is borrowed to finance the farm business. This risk can be caused by uncertainty about future interest rates, a lender's demand to continue to provide funds needed, and the ability of the borrower to generate the income necessary for debt repayment. Smallholder farmers who borrow money at high interest rates may have particular difficulty making debt repayments. Lower than expected prices, combined with low yields, can make debt repayment difficult and even lead to the sale other assets owned before credit participation.

Human and personal risk: This type of risk refers to the risks to the farm business happened due to illness or death and the personal state of the farm family including labor migration away from farm business causing labor shortages resulting in lower production. Political and social unrest can also limit labor availability. The spread of dangerous disease like HIV/AIDS has had a serious impact on labor availability and productivity in some areas.

When farmers plant their crop or commit resources to raise livestock they cannot be certain whether they will have enough labor to manage the farm enterprises.

On the other hand, Bielza *et al.*, (2008) cited by Bishu (2014) classified risk type by six and showed source of risk various types. These include production risk and sources of the risk as drought, flood, hail, frost, fire, wild animals, livestock diseases, livestock mortality, insects and other pests. The second one was marketing risk which happens due to changes in demand and supply, market access, price variability and poor market information. Financial risk: - Expected sources are changes in interest rates, foreign exchange value, inflation, access to credit, debt-to-asset ratio, repay loans, debt financing, cash flow. The third one was institutional risk, which occurs due to changes in regional or national or international policy, laws and regulation, property rights. The fourth one is technological risk and the reason for this risk occurrence are sing obsolete technology, use of modern breeding, use of artificial insemination (AI), adoption of high yield external input. The last one is human risk caused by lack of a trusting relationship, lack of consistent communication, three D's (divorce, death and disabilities), illness and conflict and shortage of labor are determined to be source for the risk.

2.2.2. Risk Management Strategies

It is necessary that, prior identification of the sources of risk in agriculture is important because it helps to choose the appropriate management strategy. Different farming systems, the ratio of agricultural income to total family income, as well as the size of arable land, differentiates their risk response. The operators' risk preference affects the type of agricultural activities and corresponding scales that are designated. Farm size, age, innovativeness and risk aversion habit determine the choice of risk management strategy by. Given a fixed amount of productive resources such as arable land, capital and labor force, the diversification of production activities with the highest level of expected income/risk would be selected if the decision maker was a risk taker. For combinations of activities with a lower risk level, diversification might reduce expected risks to some level at a cost of total return farmers would gain (Korir, 2011).

According to, Antonaci *et al.*, (2014), risk management strategies can be classified into two broad categories; ex-ante risk management and ex-post strategies.

Ex-ante Strategies

Farm operators implement ex-ante strategies due to lack of mechanisms to cope with risks ex-post. Risk like natural hazards can be managed by irrigation, crop insurance and by growing resistant varieties while market risks, managed by price stabilization programs, provision of information and credit subsidies and social and state hazards of smallholders can be improved by increasing their political participation in decisions which affect their welfare and their future (Korir, 2011). Market risks can also be managed by inventory management as well as forward and futures contracts. In addition to these, income diversification and farm enterprise diversification, organization flexibility, avoidance of high risk enterprises and holding liquid reserves of cash and credit can be some of other responses used. Income diversification involves widening the income earning portfolio. Farm enterprise diversification is used to edge against yield and price risk, disease and pest attack as well as seasonality, as farmers adjust the level of inputs and output to manage risk during operations(ibid). Another strategy of managing risk is investing off-farm activities.

Ex-post Risk Strategies

These are coping strategies once livelihoods are threatened by occurrence of adverse conditions. Ex-post strategies include re-deploying labor, depleting food reserves on farm, drawing down on other savings and asset liquidation, sale of productive assets like livestock as the last resort and activation of informal insurance networks within the extended family e.g. food relief, gifts or other remittances for survival and loans from informal welfare groups or other institutions.

Similarly, the report of Kahan (2008) showed risk management approaches can be categorized as production, marketing, financial, human and institutional. According to the researcher, decision makers on farm can choose and combine strategies based on their goals, attitudes towards risk and their personal and financial capacity. Each individual farm family needs to find their own ways of coping with risk and their responses to risk are also diverse depending on the risks type that affect their farms business.

Table1: Summary of agricultural risk types and risk management strategies

Risk type	Strategies	Description
Production risk	Risk-reducing inputs	Fertilizers and compost for low productivity, herbicide and pesticides use, to reduce the risk of crop injury etc.
	Risk-reducing technologies	Like, drought-resistant seed for crop; bird-damage resistant seed for cereals; disease- and pest-resistant varieties
	Selecting low-risk activities	A farmer may sacrifice an enterprise that has a high potential for return but also associated with a high risk for loss
	System flexibility	Making decisions in response to changing circumstances in farm enterprise.
	Diversification	Diversification in enterprise spreads risk and is a successful risk management strategy in agriculture.
	different locations	Works on the understanding that the same crops grown in different areas will not meet the same chance risk
	Use successive periods of time	Staggered planting can be used to manage household food supply and also to reduce the risk
	off-farm activities	Farmers may take part-time work in towns or on commercial farms or daily laborer.
Marketing risk	Spreading sales	Selling parts of the product different times during the year.
	Direct sales	Selling directly to final consumers may be a way to enhance profitability and reduce risk.
	Contractual agreements	Price uncertainty could be greatly reduced if farmers could make advance contracts with buyers of farm products
	Forward pricing	Buyer and producer agree on a price for the sale of crops or livestock in advance of delivery
	Market price information	Farmers should track symmetric price information relevant to their products
Financial risk	Credit	Increasing the capital available to farmers through lending enables them to expand their farm businesses but this, in turn, obliges them to repay outstanding debts and creates the risk of loan default.
	Liquidity	High liquidity means that the farmer can fairly easily convert assets to cash without the assets losing much value in the transaction.
	Leasing assets	Farmers can lease land, machinery, equipment or livestock to generates additional income.
	Insurance	Some farmers can insure their farms against major risks, which have a low chance of occurrence but may have very adverse consequences.
Institutional risk	Social arrangements	As part of a survival strategy the close bonds between community members results in mutual assistance and self-help when required.
	Producer groups	When farmers have sufficient trust in each other there is scope for them to work together to reduce some of the risks associated with credit mobilization, the purchase of inputs and marketing.
	Cooperatives	This provides farmers the opportunity to benefit from volume sales of produce, bulk purchases of inputs supplies, and the mobilization of credit
Human and personal risk	Good human resource management	Selecting casual workers with suitable skills and experience, regular communication, ensuring the safety of workers and providing adequate supervision and discipline

Source: Kahan (2008)

2.3. Empirical studies in farm risk and risk management strategies in Ethiopia

2.3.1. Agricultural risks in Ethiopia

Given high levels of risk farm, households have incentives to seek to assure subsistence food needs first and will be averse to the greater risk associated with higher value inputs associated with technological upgrading like fertilizer and seeds. Variability in yields due to weather shocks also has a negative impact on farmers' incentives. Producers are less likely, given the risks, to use yield-enhancing inputs as this is unprofitable in poor-rainfall years. Additionally, weather risk, among other risk factors, also makes it extremely difficult for farmers to obtain credit for production inputs which results in farmers remaining reliant on low risk, low yield production patterns and traditional coping mechanisms which sometimes be reason for low productivity. With few assets to sell and

limited access to credit, farmers in Ethiopia have had to rely on informal channels such as family and communities to deal with shortages, which increased financial related risks (ESW, 2006).

Gideon (2015) presented report on major agricultural risks at Ethiopia through Agricultural Risk Assessment Study (RAS) showed different risk categories. The first one was, natural risks, including weather, droughts and floods most frequent, impact covariant and effects on production as well as loss of human lives. Hailstorms, temperature variability, earthquakes, volcanic activity – less frequent and effects localized but can be severe. The second one was biological risks, such as crop and livestock pests and diseases which is frequent and severe impact including high livestock mortality but also high revenue losses due to export restrictions imposed by importing countries. The third one was market related risks related with volatility in input and output prices and potential changes in demand/supply. The other risk type researcher showed was policy risks explained through output market interventions (e.g. price uncertainty due to distribution of subsidized imported wheat); change in policy of regional governments and farmers' inputs uptake capacity. In addition, other risks mentioned also include, health risks, death, accidents affecting farmers/household members; land access uncertainty.

A study by Canali and Slaviero (2010) in East Hararghe Zone, Oromia Regional State showed that, recurrent drought has been depleting the already scarce resources and made the population less and less resilient and more vulnerable also with respect to minor shocks as the frequency and severity of drought has increased in the last decades. Since 1999, it has been happening almost yearly basis and which resulted in Severe crop failures and loss of livestock that affected people livelihoods. This made a quite large part of the population depend on external food aid for survival. The main type of shocks which have an impact on household food security are natural shocks that reduce production, market shocks that affect profits, related to the increase of agricultural inputs 'prices and health shocks that affect productivity due to illness, inability or death of male adult members of the households.

Ethiopia farmers suffer from some climate-related food security challenges. Rainfall levels vary greatly by region and become difficult to predict. During the past six decades, droughts have occurred every three to five years, and several serious droughts, either widespread or localized, have affected millions of people. High population increment, social conflict, and governance and institutional capacity issues aggravate the droughts' influences on farmers (Mansi and Richard, 2013).

Debebe *et al.*, (2013) found that natural shocks dominate in term of frequency and have affected almost half of all households in the past 12 months while economic shock, health shocks and crime/conflict related shocks influenced some sampled households. According to his study in terms of scope, natural and economic shocks may be characterized as covariate as their effects tend to be widespread and affect a larger number of households as opposed to health and crime/conflict shocks which are relatively idiosyncratic. Shocks are not evenly distributed across households and researchers found that health shocks are more likely to have been experienced by households with lower educational endowments, larger households and households living in the Amhara and SNNPR regions while natural shocks are also more likely to occur in the Amhara region.

Legesse (2003) study on Risk management strategies of smallholder farmers in the Eastern Highlands of Ethiopia showed that on the basis of the results obtained from the informal and the questionnaire based formal surveys, three major sources of agricultural risks as crop and livestock production risks; human health risks and institutional risks which made the rural households vulnerable to serious hardship.

Bishu (2014) by his study risk management and the potential of cattle insurance in Tigray, Northern Ethiopia showed that, risk sources in terms of likelihood of occurrence and severity were gathered under main factors by applying factor analysis. The likelihood of production, market, financial, human and institutional risks were perceived the major sources of risk by farmers in the area. In terms of severity: production, market, financial and human risk were the most severe. As the researcher said, production risks are, livestock morbidity and mortality and farmers unable to cultivate their farm land, lose income from livestock productivity, low fertility, loss of manure and dung fuel, high medication and treatment cost and taking long time to rehabilitate their livelihood. Market risks were related to cost of forage, forage shortage and variability in livestock price. Financial constraints in the form of meagre farm income, cash shortage and lack of saving found to be relevant risk source. Human risks associated with shortage of family labour and herders. The researcher also said, likelihood of institutional risks was also found worry for farmers due to property rights conflict, inadequate government support and lack of road and communication.

Gebregeziabher and Tadesse (2014) did study on farmers' perception on sources of risk, risk attitude, and management strategies in the smallholder dairy farming analysis by using factor analysis. They found major risk and sources as low milk yield due to feed shortage as the top-rated source of risk implying that smallholder dairy farmers are aware of their inability to provide sufficient quantity and quality feed to their cattle, which is a prerequisite for attaining milk yield potential. Low farm income and lack of government support were identified as the second and third major relevant sources of risk in the urban and peri-urban areas of smallholder dairy farmers in Ethiopia.

Price/market risk had high loadings on milk price variability and marketing problems. Financial risk of

smallholder dairy farmers in factor 4 is affected by low farm income, changes in interest rate, and credit availability. Human risk of factor 5 revealed high loadings of variables such as availability of hired responsible labor and family members' health situation. Lack of government support and low milk due to poor breed loaded strongly on factor 6 of the institutional risks. The researchers found good information for risk identification and management strategies that should get attention by farmers themselves, government and other concerned bodies (ibid).

2.3.2. Smallholder farmers risk management strategies in Ethiopia

According to Bishu(2014), smallholder farmers of Ethiopia, do not face identical constraints and opportunities. The main determinants of variations in perceptions of risks were: asset endowments, differential infrastructural access, differences in agro ecological zones, gender, human capital represented by family size, education level and experience, diversification of income through spatial and enterprise choice, retained output from previous harvest, access to information, health situation of household members, religion and ethnic origin.

Canali and Slaviero(2010) showed that, farmers cope up with the negative impact of shocks through use of reduced number of meals eaten per day; to sale livestock and reproductive small ruminants (like goats and sheep); migration of some family members; to obtain food or help from relatives; to harvest immature crops (e.g. green maize); to cut and sale abnormal amounts of firewood and charcoal. These shows that, risk management strategies were more dominantly based on ex-post risk Strategies than ex-ante risk Strategies, as most of them done for recovery purpose after occurrence of shocks.

Ashenafi (2017) after conducting risk management role of cooperatives through Integrated Seed Sector Development program in Ethiopia (ISSD Ethiopia) showed that, program intervention affected risk preference of the participant farmers by providing support from market related risk and motivates participants to choose riskier and more profitable crops (cash crops). Additionally, the cooperative services have improved productivity and farm income of the members which builds asset base/wealth of the participants. This perhaps increased risk taking ability of the member households. As a result, significant variation in crop choice and farm income between participants and non-participants in the program has confirmed implying the intervention has brought change in risk preference

Some of organizations worked on risk mitigation objectives in some parts of the country and participant farmers showed changes on the capacity to cope with risks. For instance, Oxfam America worked with local partners to put together a comprehensive risk management program including community works to reduce risks, as well as drought insurance, and credit and savings mechanisms to help drive investments in livelihoods in Tigray region. Participant farmers in the program and bought insurance planted more seeds, used more compost in the farm, and seemed to be switching to high-yielding-variety seeds at higher rates, compared with non-participants. Insured farmers be disposed to: use less family labor and more hired labor, diversify their income sources, and practice smaller losses of livestock (Mansi and Richard, 2013).

Kassie (2017) showed livelihood diversification, as measured by Inverse Herfindahl–Hirschman Diversity index, reveals an upbeat and significant effect on sustainable land management index of a farm household. Besides, participating in agricultural extension packages and being members of farm cooperatives have significant effects on households' sustainable land management practices and reduction of related risks. It is clear that diversification is popular measure of risk mitigation but, household head's education level, and access to credit influence the level of on-farm diversification. The researcher showed the importance of sustainable land management practice as risk management strategies. This was why the Ethiopian government also gave high attention for soil and water conservation practices to cope with drought problems.

Risk behavior is positively associated to on-farm diversification and farmers with a higher level of relative risk premium are more likely to opt for diversification of farms. The income generated could improve the liquidity condition of the farm and such farms might choose specialized commercial orientation. These could be due to the fact that households with diversified income from off and non-farm activities use this income as a safety net and go for concentrated farms with minimized risks (Ayenew *et al.*, 2014).

Debebe *et al.*, (2013) study showed that economic and natural shocks were more likely to trigger dissaving and a reduction in food consumption while the sale of assets and borrowing was relatively less likely. Coping with idiosyncratic health shocks which typically trigger a need for cash was met by reductions in savings, asset sales and especially a far greater reliance on borrowing as compared to other shocks. Reducing households' food consumption, a prominent response in the case of covariate shocks was notable due to its absence in the case of illness. The lack of reliance on this kind of strategy is consistent with the need for cash to deal with the consequences of health shocks which cannot be eagerly met by reducing food consumption. However, across all shock types, households do not tend to rely much on support from family and friends or on enhancing their labor supply as coping approaches.

Bishu (2014) used descriptive statistics to identify the major risk management strategies in livestock farming Tigray region and showed major strategies to cope with risk as, disease control, finance management, safety net, feed management, cooperatives and diversification. Effective delivery of veterinary services, proper

loan allocation and loan repayment, participation in the productive safety net program (PSNP) in food or cash for work in public activities such as soil and water conservation, road construction, reforestation, small scale irrigation in the case of drought caused food shortage, joining cooperatives in order to get credit access and other agricultural input, diversification and livestock feed management like the use of mixed crop-livestock farming as relevant strategies to counter risks in the area. However, number of socio-economic and geographic variables were found to be significantly affecting risk management strategies; such as, majorly, household income and family size.

ESW (2006) did risk analysis in Alaba area of southern Ethiopia showed that farmers in the area face different risks and also use different coping strategies. Hail risk managed through substitute with other crop depending on sowing time. Migratory pest managed through, Spray insecticide and substitute with other crop, if damage occurred at early crop stage, sell of livestock to buy food, the poor participate in food for work, women do additional work to collect and sell a local grass on the market. Frost risk also happened and farmers used coping mechanism like plant early on belg cropping season. Children travel to factories for work and get cash to buy food. At time of rain fall shortage selling livestock to buy food, temporarily migration to find work and better-off ones help the others.

Okonya *et al.* (2013) showed, farmers' coping strategies towards extreme events of drought and floods as storing food, income diversification and digging drainage channels including planting trees; high-yielding, early-maturing, drought-tolerant, disease and/or pest-resistant varieties; planting at onset of rains; increased pesticide/fungicide application among others. The smallholder farmer households interviewed have a high awareness of changes in rainfall and temperature and have taken measures to cope with effects of a this changing climate. In addition, other, major risk management strategies that dairy farmers practice were reducing cattle number, income diversification, financial management, and expanding market networks.

Concluding remarks

Agricultural risk occurs whenever the consequences of a decision made by the operator is not entirely known at the time when decision is made. Due to this condition, different ways of managing risk are used by small holder farmers. Risk management strategies can be categorized as production, marketing, financial, human and institutional as also related with type of risks. Farmers may try to prevent an unfavorable event from happening or they may take actions to lessen the adverse consequences to the farm product and marketing also. Farmers choice and combination of strategies was based on their goals, attitudes towards risk and their personal and financial situations. Since the type and extent of risk households faced varies, each individual farm family needs to find their own ways of coping with risk. Therefore, farmers' responses to risk are as diverse as the risks that affect their farms.

Due to these variations, identifying small holder farmers' specific risk sources and risk attitude including indigenous risk management strategies could contribute to agricultural sector development and poverty alleviation in the country as capacity to absorb and manage shocks is important to farm households' wellbeing and economic growth at large as the country depends on it highly.

In Ethiopia, smallholder farmers are facing different risks associated with agriculture, such as, drought, flood, rain fall shortage, animal and human health problem, disease and pest infestation on crops, market price fluctuation risk, institutional support problem, credit access problem, and other adverse weather change related problems that reduce farm productivity and affect farm households' wellbeing.

Farm households used different coping strategies depending on type of risk they faced. Risk management strategies were more dominantly based on ex-post risk strategies than ex-ante risk Strategies, as most of them done for recovery purpose after occurrence of shocks. Use of irrigation, soil and water conservation, income and farm enterprise diversification, insecticide and pesticide use, sale of productive assets like livestock, need of food relief, gifts or other remittances, migration to other better areas, reduction of meals taken per day, and planting of early and drought resistant crop were some of major coping strategies farmers use in Ethiopia.

To develop the capacity to bring better service support with sound policy, it is necessarily need of sound and practical understanding of the type of risks that farmers are facing or likely to face in relation with respective risk management strategies. It is necessary to identify the most appropriate risk management options, assess their benefits and costs and the impact of the risk management strategies to the households on agricultural sector.

Suitable policies are very highly needed to strengthen and support farmers' capacity to adapt to and cope with some risk sources which were not fully solved by only farmers. Provision of support service in production and conservation of livestock fodder as well as participation of farmers in soil and water conservation practices should be key policy options relevant to drought related risks in the country. In addition, increasing farmers' access to climate change related information, especially drought forecasts, could improve the timely adoption of effective adaptation strategies in changing situations. Furthermore, formal financial institutions should be strengthened to support farmers' adaptation to riskier climatic conditions in the future and to facilitate consumption smoothing during drought periods through effective credit and other financial strategies.

Since farmers participation in cooperatives have positive impact on risk preference and farm income and

risk management, increasing access to cooperatives via organizing pool of farmers, highly promoting cooperative expansion and improving their involvement in created market linkage is needed to reduce risk aversion behavior of smallholder farmers and managing risks.

Farmers are trying their best for mitigating this normal and common sectors problem and thus, support from government, other NGOs and financial institutions is highly needed in provision of crop and livestock insurance service, availing contract markets, supply and expansion of use of flexible agricultural facilities and equipment and other necessary supports which are needed for alleviation for risk problems which are beyond the farmers to be solved by themselves.

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