PARTICIPATION OF FARMERS IN WEATHER-INDEX-BASED CROP MICROINSURANCE SCHEME: A CASE STUDY OF FARMERS AT SHASHEMENE DISTRICT, OROMIA REGION, ETHIOPIA

Tamrat Woldegiorgis[1]

Abstract

Weather-Index-based Crop Insurance scheme has emerged as a risk pooling mechanism by both international NGOs and financial institutions in Ethiopia. However, the take up rate without subsidy is very minimal and even some were terminated after a pilot period; commercial viability of the product is not yet driving the supply that is pioneered by some Insurance companies. Demand side study, in this regard, is scarce. Hence, this study deals with determinants of Willingness to Join (WTJ) and Willingness to Pay (WTP) for Weather-index-based crop microinsurance on 150 sample respondents, at Shashemene district using Double Bounded Dichotomous Choice Contingent Valuation Method. Heckman two-stage econometric estimation procedure was employed to identify the determinants. It was found that some households prefer either to stay away from participating in microinsurance scheme or pay lesser amount of premium. Those who did not want to pay the premiumhad claimed that they expect the service to be provided either by the government or donors. On average,only 12.9% of farmers were willing to pay for the service, which is below the average actuarial premium rate of the area. Study findings imply that there is a need for the government and other stakeholders to exert more effort towards farmers' awareness and product literacy so that the current take up rate improves. It also implies that, policy on farm land leasing might have an important role on the product adoption rate.

Key Words: Weather Index Based Crop Microinsurance, Contingent valuation method

[1]Regional Coordinator, EDC, <woldegiorgis_t@yahoo.com>

INTRODUCTION

For the majority of rural poor households in developing countries who depend on traditional rain-fed agricultural economies, the variations in weather conditions put them into substantial risks (Molini et al, 2008). There is no mechanism in place in many low income countries to protect their large losses from extreme weather events and so their income and economic activities are likely to be worsened (Angove and Tande, 2011). With few assets in the hands of these poor households, the uninsured farmers are exposed to risksdue to unexpected weather events which trap them into chronic poverty when they do not have any other external financial support (Barnett et al, 2008)..

Ethiopia is one of the African countries frequently exposed to extreme drought causing severe economic losses and crop failure (Melaku, 2013). As noted by Viste (2012), the years 1973, 1982, 1984, 1987, 1990, 1992 1999, 2002 and 2009 were the major drought years, with more severity experienced in 1984 and 2002 which had endangered the lives of many people. In such situations, households respond with costly coping strategies, including selling productive assets or cutting consumption to minimal levels, limit themselves from using agricultural inputs to enhance productivity. Hence, the need to have effective risk management strategies and tools are an imperative agenda for bothGovernment and Non-Government Organizations.

A survey by Saris et al (2006) in the Kilimanjaro and Ruvuma regions of Tanzania had indicated that households were affected by variety of shocks, of which, weather related ones were found to be very important. Various

types of insurance products are considered, among which, insuring the subscriber against loss of harvest, also called Crop microinsurance based on weather index is one that recently received considerable attention (Ombeline, 2012).

Weather-index-based insurance can be used as a tool for disaster relief and for development. More faster and cost effective alternative tool for disaster relief is needed tohelpfarmers protect their investment (P.Hazell et al, 2010), like access to credit and modern farming inputs. The risk would be based on weather index (e.g., level of rainfall) which farmers cannot influence greatly. However, 'basis risk', which can be described as the mismatch between the amounts received because the index has been triggered, and the amount actually lost by the client is a challenge (Bryla and Syroka, 2008). Improved data collection and product design may be able to minimize 'basis risk'. This typically makes the product more complex and more difficult for the low-income market to understand.

Very recently, within the last seven years, some international NGOs, in collaboration with local financial institutions, had initiated and piloted the product, Weather-Index-Based Crop Insurance (WIBCI)scheme in Ethiopia. The take up rate was very minimal and some farmers had even terminated after the pilot period. For instance, a WIBCI pilot project at Alabaworeda, Southern Nations, Nationalities and Peoples Region, sponsored by World Bank and World Food Program with Ethiopian Insurance Corporation as intermediary in 2006 had proved hard to sell any rainfall insurance policies and eventually the pilot ceased to operate (Mosley P., 2009).

On the other hand, commercial viability of the product was not driving the supply for projects pioneered by Oromiya and Nyala Insurance companies.

Theoretically, as poor individuals display a relatively high level of risk aversion, the demand for microinsurance products was thus expected to be high (McIntosha C et al, 2013). However, practically, as observed by studies, including assessment by a research team of BASIS I4 and IFPRI, sales of weather index insurance were disappointing, apart from its encouraging trend in pilots with subsidies (Guush et al, 2013).

Despite these realities, there are no sufficient studies in the field clarifying the reasons for the low uptake and limited expansion. Therefore, the main objective of this study was to assess farmers willingness to join Weather-Index-Based Crop Microinsurance scheme and willingness to pay premiums at Rift Valley region . More specifically, the main objective was:

- to identify determinants that influence rural farmers' to join crop micro-insurance scheme and to pay the premium, and
- to assess farmers' capacity to determine the mean WTP for WIBCMI scheme.

WTP for a product may be defined, as the amount of money an individual or household is willing to pay to purchase a product, given ones income, risk preferences and other background characteristics. While WTJ indicates individual's interest to purchase the product.

The study will have a particular significanceto development practitioners, emergency programs and commercial operation, though the study is only confined to maize producers of a district that may limit the generalization to farmers growing other crops.

2. RESEARCH METHODOLOGY

2.1. The Study Area

The study district- ShashemeneZuria- is situated in Oromia region, West Arsi Zone, 245 Kms south of Addis Ababa, the capital city. It is a district in the Great East African Rift valley where drought is persistent (Abate, 2009). With a total population of 246,774, the district has 45,630 households in 36 kebeles(CSA, 2007). Almost half of the population (46.3%) is within the age category of 15-60 years. The district covers an area of 760 square kilometers with a density of 325 persons per square kilometer. Ninety five percent of the population is rural; and agriculture is the main stay of the economy, rich in crop production (Mitiku et al, 2012), where cereals like, maize, teff and sorghum production is predominant. On average, thirty quintals of maize is produced per hectare of land by private peasant holdings in the area (CSA, 2012/13). The altitude of this district ranges between 1500 to 2300 meters above sea level. Average land holding and cultivated land size per household is 1.66 and 1.28 hectare, respectively (Bureau of Finance and Economic Development of Oromia, 2009).

Oromifa is the dominant language, while Islam is the dominant religion (86%) of the population followed by Protestant and Orthodox Christian followers (6.3& and 6.0%, respectively) (CSA, 2007). There are some micro-finance institutions, banks and insurance companies in the district in addition to farmers' cooperatives.

2.2. Sampling and Data Collection Method

A total of 150 sample households were selected using two-stage random sampling from the list of two kebele (smallest administrative regions in

Ethiopia) households who had lived for more than five years in the area and engaged in maize production. Respondents residing for several years in the area were assumed to havesufficient understanding of the effect of drought.

Most common and broadly used approaches to obtain information on WTP is double-bounded dichotomous choice (DBDC) contingent valuation method which has the advantage of higher statistical efficiency over the single-bounded model (Pythagore et al, 2012). Procedurally, an individual was offered the product at a starting price; and two sequences of bids were offeredto respondents. Depending on the respondents' view to the first bid, the second bid could be moved downwards or upwards.Contingent Valuation Method (CVM), which is popularly applied as a method to estimate 'consumers-willingness-to-pay' that resulted from theoretical and empirical analysis byRodriguez et al (2007), was used in the study.

Primary data were collectedfrom households employing DBDC elicitation method since it hadadvantages of higher statistical efficiency than the single-bounded model (Pythagore H, et al., 2012). As the idea was to sell the concept of WIBCI rather than an actual product and to boost the understanding level of the product, a hypothetical product was designed in a simple manner that was easy to understand.

2.3. Data Analysis

Both descriptive and econometric analyses were used to analyze the variables.

2.3.1. Model Specification

Most empirical studies utilized Maximum Likelihood method to analyze WTP with the framework of DBDC contingent valuation method. Dagnew et al (2010) employed the same method to analyze households' WTP for improved solid waste management at Mekele city, Ethiopia. Janani A. (2012) had employed the model to study WTP for index based crop microinsurance in India. Similarly, Bekabil and Anemut (2009) have used the Heckman's two-stage econometric estimation: at first stage Maximum Likelihood method and then Ordinary Least Squares (OLS) at the second stage to examine WTP on parks conservation strategy. In regressions, when the dependent variable to be modeled is limited in its range,using OLS estimator results in heteroskedasticity problem (Gujarati, 2004). With that consideration, this study had usedProbit model since the dependent variable was a categorical variable with two possible outcomes. Assuming a linear functional form for WTJ equation (Gujarati, 2004), the WTJ can be defined as:

$$WTJ_i = ß'X_i + \varepsilon_i \quad (1)$$

Where, ß is a vector of parameters; X_i denotes vector of exogenous characteristics; and ε_i is the random error term with mean zero and variance σ^2.

The Probit Model

Here, using Heckman's two-step technique, firstly estimated the probability of the WTJ decision of the households using a Probit model as:

$$WTJ_i = \begin{cases} 1, \text{ if } WTJ_i^* > 0 \\ 0, \text{ if } WTJ_i^* \leq 0 \end{cases} \quad (2)$$

Where, $WTJ_i^* = ß'X_i + \varepsilon_i$ is a latent variable that was not observed.

Note that, in this study, WTP can only be observed if an individual is WTJ in the microinsurance program. The Likelihood function is defined as follows:

$$L = \prod_{WTJi^*=-\infty}^{0} \Pr(WTJi^* \leq 0) \prod_{WTJi^*>0}^{\infty} {}^{i} \Pr(WTJi^*>0,\ Lb_i < WTP < Ub_i) \quad (3)$$

Ordinary Least Square Model (OLS)

In the second stage, Lambda, Inverse Mill's ratio, the selection control factor is derived from equation (3) and added to the second stage estimation to see the effect of all the unmeasured characteristics which are related to the households' decision to join WIBCMI.

WTP conditional on WTJ: $[WTPi/WTJ_i^*>0] = \alpha_i X_i + \alpha_i \lambda_i (ß' X_i) + \varepsilon_i$ (4)

It is the amount (intensity) of payment by the i^{th} household, Xi is the socio-economic and institutional characteristics of the i^{th} household, α_i represents parameters of the model,

$\alpha_\lambda = \rho\sigma_\varepsilon$ and Inverse Mill's ratio that is $\hat{\lambda}_i(\beta' X_i) = \dfrac{\phi(\beta' X_i)}{\Phi(\beta' X_i)}$,

$\phi(\ )$ & $\Phi(\ )$ represent the density and distribution functions for the standard normal variable, respectively; and ε_i & v_i bivariate normal $(0, 0, \rho, \sigma)$.

2.3.2. Hypothesis and Measurement of Variables

On the basis of the theory and objectives of the study, the following dependent and independent variables are hypothesized:

Variable	Code	Type of variable	HO		Measurement
			WTJ	WTP	
Willingness to Join to a Crop Microinsurance scheme	WTJ	Dummy			Dependent variable -takes 1 if the farmer is WTJ and 0 otherwise
Maximum Willingness to Pay to a Crop Microinsurance	MWTP	Continuous			Dependent variable measured in Birr
Starting Bid	SBID	Continuous		+	The initial bids offered to respondents measured in birr
Household Size	HHS	Discrete	+	+	Number of members in the HH.
Age of the household head	AGE	Continuous	-	-	Measured in years
Sex of the household head	SEX	Dummy	-	-	1 if male 0 otherwise
Planted Land Quintiles Base Category Land 1	LAND Q1	Dummy	-	-	1=Belongs to the quintile,0= otherwise
Land 2	LAND Q2	Dummy	-	-	1=Belongs to the quintile,0=otherwise
Land 3	LAND Q3	Dummy	+	+	1=Belongs to the quintile,0=otherwise
Land 4	LAND Q4	Dummy	+	+	1=Belongs to the quintile,0=otherwise
Land 5(highest)	LAND Q5	Dummy	+	+	1=Belongs to the quintile,0=otherwise
Education level	EDU	Continuous	+	+	Level of Grade achieved
Growing More than One crop	GMOC	Dummy	-	-	1= Yes, 0=No
Effectiveness of Substitutes	ES	Dummy	-	-	1= if effective 0= otherwise
Trust in Management of Scheme	TMS	Dummy	+	+	1= if trusting, 0 = otherwise
Product literacy	PLT	Dummy	+	+	1= if literate , 0 = otherwise
SHG/MFI Member	SHG	Dummy	-	+	1= if Member, 0 = otherwise
Marriage	MARR	Dummy	+	+	1= if Married, 0 = otherwise
Planted Land Ownership	PLO	Dummy	+	+	1= if using Own plus Leased land, 0 = otherwise

3. RESULTS AND DISCUSSION

3.1. Household's Socio-Economic Characteristics

One-third of the respondents were households headed by females while the remaining were male-headed households. In general, 85% of male and 76% of female respondents were willing to pay the premium in the microinsurance scheme (Table 2).

Table 2. Socio-economic characteristics of sample households in relations to WTJ and WTP

Households' Characteristics			Total		WTJ			WTP		
Variables				%	Yes	No	% of Yes	Yes	No	% of Yes
Gender	Male		100	67%	94	6	70%	85	9	69%
	Female		50	33%	40	10	30%	38	2	31%
	Total		**150**	**100%**	**134**	**16**	**100%**	123	11	100%
Education	Zero year	Male	17	17%	16	1	17%	10	6	12%
		Female	22	44%	18	4	45%	18	0	47%
	Zero year	Male	83	83%	78	5	83%	75	3	88%
		Female	28	56%	22	6	55%	20	2	53%
Marriage	Married		117	78%	105	12	78%	97	8	79%
	Single		33	22%	29	4	22%	26	3	21%
	Total		**150**	**100%**	**134**		**100%**	123	11	100%
Effectiveness of Substitute	Yes		87	58%	86	5	61%	81	1	66%
	No		63	42%	48	11	39%	42	10	34%
	Total		**150**	**100%**	**134**		**100%**	123	11	100%
Trust in management	Yes		91	61%	110	5	64%	86	0	70%
	No		59	39%	24	11	36%	37	11	30%
	Total		**150**	**100%**	**134**		**100%**	123	11	100%
Product literacy	Yes		115	77%	110	5	82%	109	1	89%
	No		35	23%	24	11	18%	14	10	11%
	Total		**150**	**100%**	**134**		**100%**	123	11	100%
Member of SHG/MFI	Yes		62	41%	60	2	45%	60	0	49%
	No		88	59%	74	14	55%	63	11	51%
	Total		150	**100%**	**134**	16	**100%**	123	11	100%
Planted land Ownership	Own		128	85%	113	15	94%	102	11	100%
	Own + Leased		22	15%	21	1	6%	21	0	0%
	Total		150	**100%**	**134**	16	**100%**	123	11	**100%**

Source: Computation from survey data of the study

On average, femaleandmalerespondentshad 2.4 and 4.4 years of education, respectively. Mean education level, in number of years, for those responding positively to WTP was 3.88; while for thoseresponding negatively to WTPwas 1.9, implying that education has direct and positive

relation with willingness to pay for the product. About 26 percent of the total sample respondents and 22.7 percent of those respondents to WTP wereilliterate. Mean education levelforall sample respondents was only3.73 years.

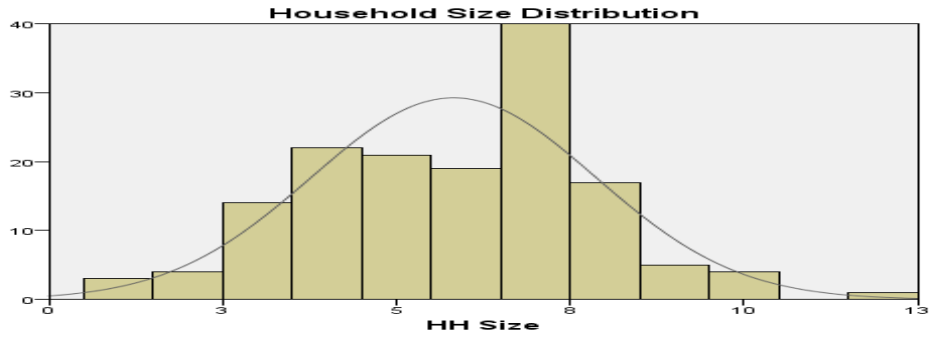
Fifty eight percent of the households had access to effective substitutes of income sources, such as borrowings, savings and other income means.
Even though married households had shown slightly better willingness to pay for the micro-insurance than singles, marriage had little effect in the interest to join the microfinance scheme and pay the premium (Table 2).
Product literacy has positively influencing the WTPas 95 percent of product literate households had shown a willingness to pay for the product (Table 2).

Some farmers in the study area had experienced land leasing for growing crops.Based on the survey, fifteen percent of the households used leased land for crop production in addition to their own land,andall of them had indicated their willingness to pay for the service in the microinsurance scheme.

More than half of the respondents (57 %) ownland size of less than one hectare. Eighty percent of the sample households had owned land size of less than the actual holding average for the region, which was 1.6 hectare per household (Bureau of Finance and Economic Development of Oromia, 2009) signifying the scarcity of land in the study area.

The average age for the respondentswas 37.1 years with standard deviation of 12.7, while the mean household size of the sample respondents was 5.8,

which is slightly higher than the district average (5.2) for rural households (CSA, 2007). Household size varies from one to twelve persons per household, distributed near normal with median of 6 and standard deviation of 2.04 (Fig 1).



Source: Own computation from survey data of the study

Fig. 1 Distribution of household size of sample respondents

According to information generated from the survey, somehouseholds relymore on Super-being to rescue their crop from weather induced damages than joining the microfinance scheme. In fact,11 percent of the total samples resort to such belief, especially the oldergeneration wholeanmore towards this belief than the younger individuals.

3.2. Analysis using Econometric Model

Prior to the estimation of the model parameters, the problem of multicollinearity or association among the potential explanatory variables was tested.Variance inflation factor (VIF) was used to check the multicollinearity problem in continuous variables, and contingency coefficient (CC) was used for dummy variables. Two variables, namely: growing more than One Crop (GMOC) and base category land which is the

lowest land area in hectare (LANDQ1) are omitted from the model due to collinearity. Consequently, the data were entered and analysis was carriedout using STATA software to derive the parameter estimates ofthe Heckmans two stage econometric model.

A study by Janani (2012) in India, among 400 small and marginal turmeric farmers in Tamil Nadu, has revealed that different factors, including: age of the household head, risk attitude and being member of SHG (self help group)/MFI (microfinance institutions) were found to be significant and have negative influence on the WTJ and WTP. While explanatory variables, like product literacy, average land size, growing more than one crop and education level were found to have significant positive influence on the dependent variables. On the other hand, start-bid had shown significant positive influence on WTP on those households who had decided to join the scheme.

As shown in Table 3, out of the total explanatory variables, only 9 variables were found to be significantly influencing households' decision to join weather-index-crop-microinsurance scheme. On the other hand, 8 variables were found to be significantly influencing the extent of farmers willingness to pay (WTP) for the product where Start-bid and Lambda (Invers Mill's Ratio) were included as explanatory variables. As the measure of goodness of fit (Adj R-squared) indicates, 67 percent of the total variation in the dependent variable is explained by the model (explanatory variables). The estimated coefficients measure the marginal effects of explanatory variables on the amountof Birr they were willing to pay.

Table 3: Heckmans Two-Stage Econometric Estimation

Variables	WTJ-First Stage estimation			WTP-Second Stage Estimation
	Coefficient	Marginal Effect	x=Mean	Coefficient
SEX	0.024	-0.002	0.701	-31.3674
AGE	0.012***	0.434	35.78	-2.7607*
MARR	0.159***	0.126	0.784	-38.0263
EDU	0.011*	0.026	3.738	15.8824***
HHS	0.014	0.088	5.813	-0.7733
ES	0.097***	0.055	0.612	-3.8478
TMS	0.165***	0.102	0.642	-71.9066*
PLT	0.156**	0.172	0.821	176.5729***
SHG	-0.081**	-0.034	0.448	69.4970**
PLO	0.092**	0.018	0.157	67.3149*
LANDQ2	0.042	0.022	0.358	-30.1936
LANDQ3	-0.013	-0.001	0.231	8.3149
LANDQ4	-0.181**	-0.005	0.03	72.5680
LANDQ5	-0.001	0.005	0.015	51.3661
STRTBID				0.7898***
LAMBDA				-23.1390***
Constant				99.8103
R-squared = 0.7066, Adj R-squared = 0.6665				
***, ** and * indicate statistically significant at 1%, 5% and 10% levels, respectively				

Source: Own Computation from survey data of the study

Aged household heads had shown higher interest to join but willing to pay fewer premiums for WIBCMI than the younger ones. In line with Janani's (2012) finding, WTP was hypothesized to have negative relation with WTJ. A marginal change in age from the average of 35.78 years is associated with 43.4 percent increase in household decision to join in the scheme, other variables being constant. Older people might have preference to reduce risks associated to their households.On average, as the age of a household head increases by a year, the maximum amount farmers are willing to pay for weather-index-based crop microinsurance reduces by 2.76, other

variables being constant. Younger farmers might have understood the real benefit of the scheme than the aged counterparts.

A study by Ruth, et al (2011), who examined adoption of WIBCI based on learning from willingness to pay among a panel of households in rural Ethiopia, had revealed that households with good networks and having access to savings and borrowingwere found to have lower demand for insurance than those without access to these activities as long as the cost of engaging in these activities is lower than the cost of purchasing insurance. It was also found that educated individuals are more likely to join the insurance scheme.

As indicated by Ruth, et al (2011), and in agreement with the hypothesis made, educational status had been significant and had shown positive relation with the dependent variables. A marginal change in education from the average 3.73 years of education was associated with 2.6 percent increase in household decision to join the scheme. As education level of a household improves by one grade, on average, the WTP for the product increasesby 15.88, other variables being constant. This might be because literate people are relatively familiar with recent innovations, including WIBCMI, and have relative capability to analyze cost-benefits of the scheme.

Households, who had access to services, like savings and borrowings and other sources of income, had shownmore interest in the participation. The marginal effects of the regression imply that a household who has access to borrowings and saving services and other sources of income would have a 5.5 percent higher probability of participation in the microinsurance scheme than a household who has no access to the same facilities. The result is consistent to the findings of P.all et al (2010). One of the reasons provided

might be that when such new and not familiar schemes are tied to already existing effective services, like credit and savings, people might easily understand the benefits of the scheme. Based on the regression analysis, the probability of people's participation increases as people trust the management of a scheme. This result is consistent with thehypothesis and empirical findingspresented by Janani (2012).

Since literate individuals are considered tohave the capacity to weigh the cost-benefits of the scheme, participants in this study had shown greater interest to join and pay higher premium in WIBCI scheme. A study by Daniel C. and Gautam K. (2011) depicts the same findings which is in confirmation with the proposed hypothesis.

The result of marginal effect implies that, product literate individual has 17.2 percent higher probability of participation in the microinsurance scheme than product illiterate individual. Literacy of the product and understanding the value of insurance increasesthe willingness to pay for the product, on average, by 176.57 than those households who do not understand and unaware of the product, other variables held constant. In a study on the demand for microinsurance in rural Ethiopia, Daniel C. and Gautam K. (2011) found that, despite the substantial welfare benefits that could arise from improved agricultural risk management, voluntary purchase of microinsurance products had been much lower than anticipated. They had also revealed that product literacy have positive and significant influence on the decision to purchase the product.

Farmers using additional land (through leasing) beyond their own plot had higher interest to join the scheme and pay the premium. On average, using

leased land increases households MWTP for the product by 57.31. One of the reasons for this might be that farmers by using additional leased land are risk averse than those who had not leased, i.e., in case of crop failure they can receive payouts that, at least, substantiate to cover their lease expense.

The small holder households in the study area were willing to pay, on average, a premium rate of 12.9% (Birr 578.40) premium to insure half-hectare of land, in order toreceive payout of Birr 4,500.00 in case of drought, which is slightly lesser than the current average market rate in the area.

The mean WTP (μ) using the regression result of the Heckman's two stage procedure for CVM is calculated as follows (Dagnew, et al, 2010):

$\mu = -\alpha/\beta$ where, α is the intercept; and β is the coefficient of start-bid (STRTBID).

Accordingly, the mean WTP of the sample households for the WIBCMI is found to be Ethiopian Birr 578.40 per half-hectare of land insured, which is equalto premium rate of 12.9%.

4. CONCLUSION AND POLICY IMPLICATION

4.1. Conclusion

Households respond with costly coping strategies at times of calamities leading to crop failure. Although Weather-Index based-Crop Insurance is initiated as a risk pooling mechanism, the take up rate without subsidy is observed to have very minimal, commercial viability of the product is not yet driving the supply that is pioneered by some insurance companies.

Demand side study, in this regard, is scarce. Determining the major socio-economic factors that determine maize producing smallholder households' decision making to whether or not participate and MWTP for WIBCMI scheme was the central objective of the study.

Tying microinsurance product with existing services, like savings and credit,it will increase the rate of the product uptake by the farmers. At the initial stage, they may consider these existing services (savings and credit) as substitute for micro-insurance. However, once the farmers decided to join, they are willing to pay higher amount of premium.

4.2. Policy Implications

Household heads that are better educated may have better access to information related to the benefits of micro-insurance. Therefore, enhancing the educational status of the farmers through adult education in the current farmers' training centers and the expansion of primary education in the locality is highly recommended.

Creating awareness to households on how formal insurance works, and how they can cater to catastrophic shocks by pooling risks across larger geographies may encourage them to invest in market-based formal risk management techniques, such as,microinsurance to deal with shocks in the long run. Integrating the subject matter in the current farmers' training centers, advocating using local mass media, attaching the subject with one of the duties of extension workers would help address the knowledge gap.

It is apparent that willingness of farmers' to invest in measures that might increase their productivity and improve their economic situation would

encourage investment. Households who have invested on leased land had shown higher interest to join WTJ and had expressed their willingness to pay.

Being a member of MFI/SHG has an impact on the possibility ofhouseholds' to join WIBCI. Hence, expansion of the MFI industry and incorporating the insurance with the current products and services is an opportunity to the microfinance sector.

The result of this study indicates that MWTP for the service rendered was found to be slightly lower than the average premium rate for similar products offered by pioneering insurance companies operating in the region. Therefore, byworking towardsimprovingthe operational efficiency and reducing inflated costs the premium rate would probably be minimized to improve the take up rate.

REFERENCES

Abate Feyisa2009. *Climate Change Impact on Livelihood, Vulnerability and Coping Mechanisms:* A Case Study of West- Arsis Zone,Ethiopia, Unpublished MSc. Thesis Submitted to Lunde University Masters program in Environmental Studies and Sustainable Science(LUMES), Lunde, Sweden

Angove J. and Tande N.2011. *Business case of Microinsurance: Analysis of the profitability of Microinsurance for five Insurance Companies*, Microinsurance Innovation facility and ILO,

Barnett, B. J., C. B. Barrett and J. R. Skees, 2008. Poverty traps and index-based risk transfer products. World Development, 36(10): 1766-1785.

BekabilFufa and AnemutBelete 2009.*Park with People Conservation Strategy: Local Residents' Willingness to pay and Expected Net losses in Ethiopia*, Unpublished Manuscript.

Bryla.E. WB, and Syroka J, WFP2009.*Index Insurance for Agriculture in Developing Countries: Moving beyond pilots.* Unpublished Manuscript, World Bank and UN World Food Program.

Bureau of Finance and Economic Development 2009, *Physical and Socio-Economic Profile of Oromia*, Regional Data and Information Preparation and Dissemination Core Process

Craig McIntosha, Alexander Sarrisb, Fotis Papadopoulos 2013: *Productivity, credit, risk, and the demand for weather index insurance in smallholder agriculture in Ethiopia,*University of California, San Diego, 9500 Gillman Drive

CSA 2009.*Population and Development Indicators,* Ministry of Finance and Economic Development(MoFED), Population Affairs Coordination Core Process

CSA 2013. Ethiopian Agricultural Sample Survey, 2012/13

DagnewHagos, AlemuMekonen and ZenebeGebreegziabher 2010.*Households' Willingness to Pay for Improved Solid Waste Management: The case of Mekele City*, Ethiopia, Proceedings of the Eighth International Conference on the Ethiopian Economy, Ethiopian Economics Association, Vol I, pp 207-237.

Daniel Clarke and GautamKalani 2011.*Microinsurance decisions*: Evidence from Ethiopia, University of Oxford

Gujarati 2004.*Basic Econometrics Forth Edition*,The McGraw-Hill Campanies, 4th ed

Guush B., Clarke D., Vargas H., Alemayehu S. 2013. *Insuring Against the Weather: Addressing the Challenges of Basis Risk in Index Insurance Using Gap Insurance in Ethiopia*, Unpublished, Index insurance Innovation Initiative

JananiAkhilandeswari 2012. *Willingness to Pay for Index Based Microinsurance in India*, University of Sussex, United Kingdom

Mosley Paul 2009. *Assessing Success of Microinsurance Programs in Meeting Insurance needs of the Poor*, Economic and Social Affairs, DESA Working paper No. 84

Molini, V., M. Keyzer, B. Van Den Boom & W. Zant 2008: Creating safety nets through semi-parametric index-basedinsurance: A simulation for Northern Ghana. Agricultural Finance Review, 68(1): 223-246.

Ombeline De Bock and WouterGelade 2012. The Demand for Microinsurance: A Literature Review, Research Paper No 26, ILO.

P. Hazell, J.Anderson, N. Balzer, A.HastrupClemmensen, U.Hess and F.Rispoli (2010): *The potential for Scale and Sustainability in Weather Index Insurance*

Pythagore H. Donfouet and Makaudze E 2012.*The Economic value of the Willingness to Pay for a Community based Prepayment scheme in Rural Cameroon*, Research paper No 3, Microinsurance Innovation Facility and ILO, Geneva

Rodriguez E. et al 2007. *Willingness to Pay for organic food in Argentina*: Evidence from a consumer survey. School of Economic and Social Sciences, Argentina

Ruth Vargas Hill, John Hoddinott and Neha Kumar 2011. Adoption of weather index insurance: Learning from willingness to pay among a panel of households in rural Ethiopia, International Food Policy Research Institute