IFAD

Enabling poor rural people
to overcome poverty

Conference on New Directions for Smallholder Agriculture
24-25 January 2011, Rome, IFAD HQ

Weather Insurance for Farmers: Experience from Ethiopia

Nahu Senaye Araya

Session 5
Breakout Session 11

Weather Insurance for Farmers: Experience from Ethiopia[1]

Nahu Senaye Araya[2]

Paper presented at the IFAD Conference on New Directions for Smallholder Agriculture
24-25 January, 2011

Enabling poor rural people to overcome poverty

International Fund for Agricultural Development
Via Paolo Di Dono, 44, Rome 00142, Italy

[2] The author is Chief Executive Officer of Nyala Insurance, Addis Ababa, Ethiopia

Summary

Agriculture is the dominant sector in the Ethiopian economy where 83% of the population fully depends on and more than 43% of the GDP is generated. This sector in turn is dominated by a subsistence farming where more than 95% is a rain fed farming of which more than 90% owned by a smallholder (mostly less than half hectar) poor farmers. These smallholder farmers are highly exposed to the negative impact of climate change mainly reflected in shortage of rainfall (draught) in this part of the continent.

The climate risk mitigation mechanisms existing in the country are more of informal traditional ways of risk sharing and risk smoothing mechanism. Whereas the covariant nature of the climate risk like draught cannot be copped with this traditional mechanisms.

Therefore as an innovative means of market mechanism Nyala Insurance S.C. (NISCO) has introduced insurance products which can help in mitigating the impact of climate risk.

To this effect NISCO has developed two innovative insurance products namely Double Trigger Multiperil Crop Insurance (DTMPCI) in 2007 and Weather Index Crop Insurance (WICI) in 2009. The former uses weather data as a trigger and a benchmark based loss assessment for indemnification purpose while the WICI totally depends on data from nearby weather stations. WICI in found to be more simple in administration and transparent than any other crop insurance products, which can play a pivotal role in climate risk mitigation process.

However, index insurance is not a panacea for the overall agricultural risk management. Indeed in spite of all challenges related with data, infrastructure etc, NISCO believes that it can it can play a critical market-based role to sustainable agricultural growth in the rural areas of developing countries in general and in drought prone countries like Ethiopia in particular.

Overview of the Ethiopian Agricultural Sector

Brief Country Profile

Ethiopia is a country located in the horn of Africa with a total land size of 1.14 million sq. km. and estimated population of about 80 million (2007 census registered 72.4 million). The country's economy is highly dependent on the Agricultural Sector which provides direct livelihood for about 83% of the population, contributing 43 – 45% of the country's Gross Domestic Product (GDP), 87% of its export earnings and around 73% of the raw material requirement of agro-based domestic industries. Above all, the agricultural sector is the prime source of food for the ever growing population of the country.

Population concentration is highest in the highlands (above 1500 meters above sea level), which accounts for about 45 percent of the country's total landmass but home for nearly 90 percent of the population.

The country has diverse agro-ecological environment. Around 55 percent of the total land area constitutes moisture-stressed arid, semi-arid and sub-moist areas with less than 120 days of crop growing period. These drier areas are commonly low in soil fertility and high in rainfall variability and drought risk. Areas with a longer and dependable period with minimum of 120 crop growing days are found in the remaining 45 percent of the total land area, particularly in the highlands (ADBG, 2008).

Though the diverse agro-ecological setting permits diverse farming and livelihood systems, crop production is by far the largest component of the agricultural economy. Out of the total arable land of 50.5 million hectares, close to 16.4 million hectares are suitable for producing annual and perennial crops. Of this estimated land area about 8 million hectares (nearly 50%) are used annually for rain-fed small holders crops (Tadesse etal, 2009).

Various studies found out that, declining farm size due to population pressure, land degradation, weak agricultural research and extension services, inefficient agricultural marketing, low use of farm inputs and technologies are some of the major hindrances of the country's agricultural sector. On top of these, significant and recurrent rainfall variability in the face of high agricultural dependency on seasonal rain, compelled the nation to encounter frequent draught and remain dependent on food aid. Economic wise assessments as well witnessed that, the country is characterized by the lowest level of real income, even in Sub-Saharan African standard. According to the UNDP (2010) Human Development Index, Ethiopia stands in the bottom of the list for those low ranked countries.

Weather Risk, Food Insecurity and Economic Growth

Ethiopia being one of the poorest countries in the world about 10 percent of the population faces a persistent food insecurity; even in normal rainfall years. This situation is frequently aggravated by weather related risks like draught and flood. In the 2003 drought alone a record of 12.6 million Ethiopians required emergency assistance, translating into 1.5 million of food aid. In the last twenty eight years (1980 up to 2008), an annual average of 1.7 million people have required food aid, primarily through emergency response (Balzer and Hess, 2009).

The country has experienced at least five major national droughts since 1980, along with dozens of local droughts. Cycles of drought create poverty traps for many households, constantly holding back efforts to build up assets and increase income. WB (2007) Survey data show that between 1999 and 2004 more than half of all households in the country experienced at least one major drought shock. The consumption levels of those reporting a serious drought were found to be 16 percent lower than those of the families not affected, and the impact of drought was found to have long-term welfare consequences: those who had suffered the most in the 1984-85 famine were still experiencing lower growth rates in consumption compared to those who had not faced serious problems in the famine (Vargan, 2010). (Please see the below table for more detail)

Number of Draught Affected People
Between 1980 and 2008

Disaster	Year	Affected (no. of people)
Drought	1980	7,000,000
Drought	1983	7,750,000
Drought	1989	6,500,000
Drought	1997	986,200
Drought	1999	4,900,000
Drought	2003	12,600,000
Drought	2005	2,600,000
Drought	2008	6,400,000

Source; - Ethiopia- Disaster statistics (2008)

According to Ethiopia-disaster statistics (2008), the country stood 5th of the 184 draught exposed countries. The below presented drought probability map better demonstrate the condition and reveals that most of the country is prone to drought.

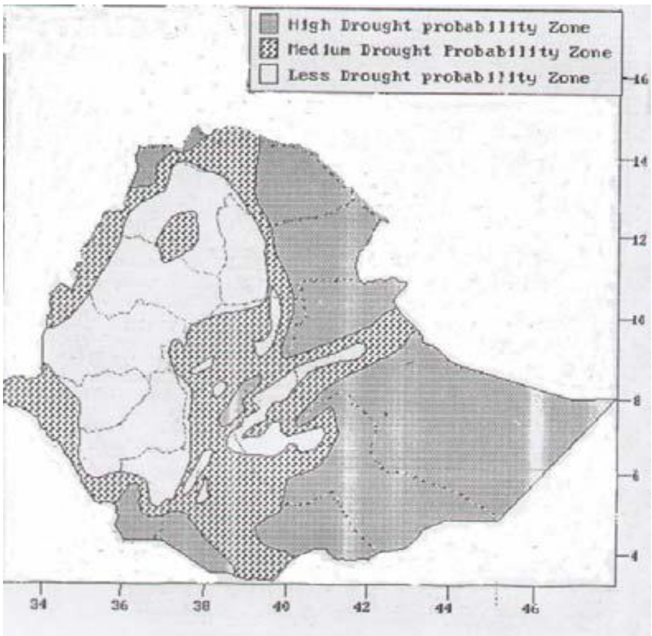


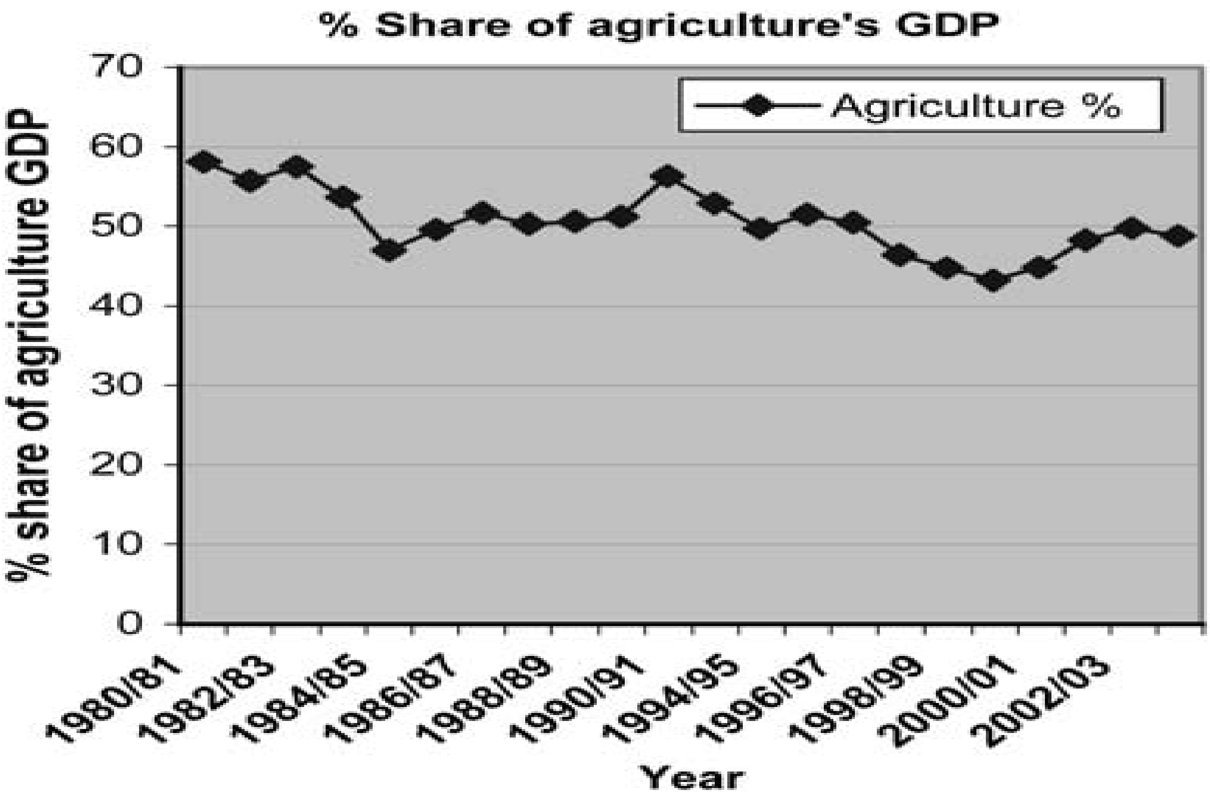
Fig. Drought Probability map of Ethiopia

Source: - Adopted from World Bank (2007)

To make things more worse with the recent years of Global warning and adverse climate change, the old assumptions about the return period (the period of time between two climatic shocks) and the severity of weather events are no more dependable. This further resulted in wearing away of the coping mechanisms and raising new challenges for the reduction of social and economic impacts of natural disasters on vulnerable populations (Pierro and Desia, 2008).

Moreover when draught strikes it will not only put the farmer and his family in to severe hunger but also compel them to consume and sell productive assets like plough cattle and seed for survival. As a result their productive capacity will be trapped and their food security will be threatened for the years to come. From these one can infer that, climate shocks are a major cause of transient poverty and hence persistence food insecurity.

Ethiopia, being highly dependent on small-scale and rain-fed agriculture which in turn is fully dependent on weather condition; the entire economy's robustness is highly reliant on weather conditions. GDP fluctuation, for instance, follows directly the fluctuation in climate conditions. The trends of the contribution of agriculture to total GDP of the country better to be explained in the following graph. As can be seen the years of drought and famine (1984/1985, 1994/1995, 2000/2001) are associated with very low contributions of agriculture to the GDP whereas years of good climate (1982/83, 1990/91) are associated with better contributions (Temesgen and Reshid, 2005).



Source: - Adopted from Temesgen and Reshid (2005)

Land tenure policy

Land is the major asset in the life of Ethiopian rural community, the way property right over land is defined is crucial for the country's overall economic development. In addition, from governments' point of view, land has many non-economic roles like maintaining social and political stability. As a result subsequent governments of the country have opted to keep this asset under state ownership (EEA, 2002).

Above all, the constitution declares that, except the state no one shall sale and/or use land as other means of exchange. (FDRE constitution article 40).

As a result the existing tenure system does not facilitate farmers to use land as collateral to secure credit from Banks. This has alienated the poor farmers from formal credit supply, which can be used as one of the means of raising productivity through enhancing inputs and technologies in their small plot of land-which is also continuously diminishing due to population pressure.

Agricultural Development strategy

Chronic food insecurity and recurrent catastrophic famines being Ethiopia's quite precarious problem, policy statements of the country including the recent past years' 'Agricultural Development-Led Industrialisation' (ADLI), the 'Sustainable Development and Poverty Reduction Programme' (SDPRP), and the 'Plan for Accelerated and Sustained Development to End Poverty' (PASDEP) emphasizes on ensuring food security and eradication of absolute poverty. There are also other programmes that support agriculture but also have social protection aspects like the 'Food Security Programme' (FSP) and 'Productive Safety Net Programme' (PSNP) (Devereux and Guenter, 2007).

Whatsoever the type of agricultural policy and programmes that the country adopt in the past years, all of them considered small holder farmers (mostly ½ hectar) as drivers of growth in the agricultural sector in particular and the wider economy in general. Even the current Growth and Transformation Plan, known as GTP for the period 2010–2015, gives top priority to small holding farmers and pledges to take steps that would increase their productivity. In addition, agriculture is expected to play a key role in generating surplus capital to speed up the country's overall socio-economic transformation in to an industrialized society.

Risk factors and Mitigation Mechanisms in Rural Ethiopia

Types of risks

Agricultural crops are susceptible to a variety of risks causing either yield reduction at farm level or value of crop losses at market level. These include shortage of rain (drought), pest and diseases, flood, excessive temperature, excessive rain, frost, fire, wind, hail, land degradation, transportation problem, price fluctuation, & market problem etc. Each of these risks varies in terms of impact on crop losses and also the loss of crop per risk varies among agricultural operators such as small holder farmers, private commercial farms and state owned farmers. In Ethiopia the impact of these risks particularly the covariant risks such as weather risks (drought and flood) on small holder farmers is totally beyond the traditions mechanisms of withstanding localized risks such as fire or hails etc.

Traditional Approaches of withstanding Shocks

Small holder farmers in Ethiopia have developed many traditional risk mitigating mechanisms that address crop loss problems due to various risks. The most widely used traditional ex-ante risk mitigation mechanism is risk smoothing where by a farmer sow his small land with different types of crops in anticipation of minimizing crop losses on his entire holdings to a portion if a risk materializes.

Another ex-ante risk mitigating mechanism widely used traditionally by farmers is a risk sharing system. One of such mechanism is a land tenure systems locally called 'Yekul'- a system by which the tenant share crop with the one who lend him his labour and/or assets like plough cattle. In addition, in most part of the country there is an existing culture of risk sharing either among the extended family members and/or the neighbourhood or friends through contributing in kind or in cash for the one who suffered from crop loss due to localized risk shock. Though these arrangements can temporarily avoid problems caused by idiosyncratic shocks, such as family illness, accidents, livestock death, fire etc. they usually fail to work in times of covariate shocks such as drought as it affects and destabilize the entire community members.

In addition to the above mentioned traditionally used ex-ante shock absorbing mechanisms, the government launched the Productive Safety Net Program (PSNP) to address the same.

Traditionally selling of animals and other productive assets are post ante shock absorbing mechanisms widely used by small holder farmers in Ethiopia. The government also used to address the shock caused by such catastrophic risks through emergency assistance provided via Disaster Prevention and Preparedness Commission (DPPC) as a relief work. However, such arrangements usually inclined to focus on humanitarian and short term assistances.

Market based risk mitigation mechanisms

Until 2006, no market based mechanisms has attempted to tackle the risk. However, in 2006, following the Global trend in trying to address the impact of weather risk shocks through market mechanism as an ex-ante measure to tackle the problem, WFP has introduced & piloted a Macro level weather risk insurance.

This was followed by the World Bank and Ethiopian Insurance Corporation (EIC) joint pilot project at a micro level in the year 2008 and Nyala Insurance. (NISCO) as a Private Insurance Co. introduced both double trigger multi-peril crop insurance (DTMPCI) and a Weather Index Crop Insurance (WICI) in 2007 & 2009, respectively.

As a market based agricultural risk mitigation mechanism, Nyala Insurance S.C. (NISCO) has started piloting Double Trigger Multiple Peril Crop Insurance (DTMPCI) since the rainy season of the year 2007. The policy has an intention of indemnifying farmers at time of loss in crop yield caused by a wide range of natural and man-made perils including variability in rainfall, fire and transit risks. Claim payment will be effected when the area recorded unusual rainfall level accompanied by loss of crop yield. This product is different from the traditional MPCI, which is more relevant to commercial farms by introducing two major techniques which can simplify the relative cumbersome nature of the administrative cost of MPCI. In this NISCO introduced a weather data based first trigger especially for the weather related risks based on long years of rainfall & temperature data available in the local weather stations and a benchmarking method to simplify a loss assessment process used as an input for the payment decision.

The company started its first pilot on DTMPCI in 2007 with Lumme-Adama Farmers Corporative Union (LAFCU) by insuring 120 individual farmers operating around Mojo and Adama areas of Oromia Regional state. The farmers were insured for Teff, Wheat and Haricot Bean. Latter on in 2009, the Company also included Erer Farmers Corporative Union operating in the adjustment area of LAFCU. around Debrezeit of Oromia regional state and the number of individual farmers reached 827. In addition to the above crops, Chickpea and Lentil crops were included in this 2009 cover. The potential total farmers under these two unions were about 47,000.

In the same year NISCO introduced Weather Index Crop Insurance (WICI) to insure small holding poor farmers (average ½ hectare) against draught. As a pilot protection was given to 337 farmers in the Tigray and Oromia regions at specific locality called Adiha and Boset, respectively. The products were designed with the help of OXFAM America and WFP, respectively.

Evolvement of Weather Insurance In Ethiopia-The Pilot Projects

Macro Level Index Insurance Pilot

Ethiopia had been piloting the first Index insurance in the rainy season of the year 2006. The entire country was insured against draught with the European reinsurer AXA Re against a premium amounted US$ 930,000, was covered by World Food Programme (WFP). The cover would provide a maximum payout of US$ 7.1m for severe droughts. However in the year under cover rainfall was virtually normal throughout the country and there was no payout at all. Nevertheless, according to WFP, the pilot project has evidenced the fact that transferring catastrophic risks to global market is possible within the Ethiopian context ((Balzer and Hess, 2009). The project had utilized an index derived from 10 years of rainfall data from 16 weather stations across Ethiopia. According to the analysis made on the data, there is 80% correlation between rainfall levels and the number of food aid beneficiaries in each year, suggesting that rainfall is a reliable objective indicator of drought-triggered vulnerability and social assistance needs (Devereux and Guenter, 2007) Indeed as the pilot did not involve local insurers, no lesson was learned by the industry players in the market.

Micro Level Index Insurance Pilot Project

Ethiopian Insurance Corporation (EIC) is a gov't owned Co. along with the world Bank has piloted a weather index insurance in 2008 for about 26 farmers in a locality called Alaba (Southern region). However the number of Insured farmers has rendered by more than 50% in the following years and did not picked up from there.

NISCO's Experience

With the objective of reducing the susceptibility of the rural poor against catastrophic weather risks and testing the feasibility of running crop insurance in general and weather index agricultural insurance business, NISCO with its partners both internationally and nationally had established a joint venture in 2007. The major stakeholders of the projects along with their corresponding roles were as follows;

For Bofa WICI (2009)

Lume Adama Cooperative Unions took part in the project designing process and as a channel to its members as well as advancing the premium as upfront settlement.
Ministry of Agriculture and Rural Development (MoARD) – Eastern Shoa Zone Helped in accessing the farmers through its extension workers.

WFP-as a support in availing technical expertise in the designing process.

Adiha WICI (2009) - Dedebit MFI – took part in the designing & marketing process as well as advancing the premium payment

Oxfam America and the Colombia University have played a major role in designing and coordinating this satellite data based WICI pilot.

WICI in Sothern Region with International Food Policy Research Institute (IFPRI)

Cooperative Unions and Iders (sort & traditional funeral society as channel)

In all the above pilot National Metrology Agency (NMA) and Swiss-Re have supported NISCO in their respective area.

NISCO's index based weather insurance was first piloted in 2009 in Bofa & Adiha areas of Oromia & Tigray Regional States with 137 and 200 farmers, respectively. This initiation was scaled up to 1,368 farmers in 2010 crop year. Similarly, the pilot project was extended to Southern Nations, Nationalities and Peoples region (SNNPR), Amhara and other areas in Oromia region in 2010. WFP and IFPRI assisted the pilot projects in providing technical support and some financial assistance. Four and Nineteen automatic weather stations donated by WFP & IFPRI respectively were installed in selected areas in three regions of the country for future project sustainability.

Recently a new pilot project entitled livestock indemnity insurance is under progress by NISCO in collaboration with Association of Ethiopian Micro-financial Institutions (AEMFI) and the World Bank. Memorandum of Understanding was signed between NISCO and AEMFI and the product is under development.

Experience from the Bofa Pilot project

In 2009 Nyala Insurance S.C. (NISCO) in collaboration with the WFP entered into partnership with local stakeholders for the joint pilot project on Weather Index Agricultural Insurance in Bofa area of Oromia regional state.

Objective

The objective of the pilot project was:
To protect the livelihoods of small scale farmer, who are vulnerable to severe and catastrophic weather risks particularly drought,
Enhance small holder farmers access to agricultural inputs, and
Enabling the development of Ex-ante market based risk management mechanism which can be scalable in the whole country,
Positioning NISCO in the Rural area of the country ahead of the competition.

Target group

The target group in the pilot project was small holder farmers with average land holding size of 0.5 hectares and vulnerable to weather risk especially deficit rainfall (drought). These farmers are members of the Lume Adama Farmers Cooperative Union (LAFCU) and mainly growers of Haricot bean, Teff and Cereals. As these farmers have little or no savings to buy agricultural inputs, they take the inputs on credit from LAFCU.

Contract Design

The pilot was selected based on the availability of weather station, vulnerability and occurrence of deficit rainfall (drought), willingness of the Union to cooperate and existence of demand (need) for weather insurance.

The design of weather index insurance contract was to cover against drought risk for the production of haricot beans in the kebele of Bofa, which is known to have recurrent rainfall deficit. In the designing process a frequent field visits were conducted between April and June 2009 to conduct a focus group discussion for the purpose of filling the gap created due to the relatively very low and scanty weather data.

In designing [3] the product, ten years rainfall data from Sodere Weather Station (15km) and two years data from the Bofa Weather Station were used to perform the historical burn analysis (HBA). No yield data are available for this area and limited weather data is available from the nearby weather stations. Therefore to fill the statistical data gap a simplified version of Water Requirement Satisfaction Index (WRSI) approach described in the FAO Irrigation and Drainage paper no. 56 were chosen to model yield reduction and resulting payout structures. A Rainfall Deficit Index is defined and a simple scheme for the computation of the index is presented. The Rainfall deficit computation panel (LEAPMETER) is also presented as a tool for transparent communication of the index calculation to the involved farmers and cooperative leaders as well as extension agents and NMA representative in the area Besides a substantial number of focus group discussions were conducted involving farmers in the area, cooperative leaders, extension agents and NMA's representative in the field.

Simple schemes for the computation of the index are established in figure for haricot beans and for teff.

Finally the following figures were arrived using the above indicated techniques and algorism.

The crop calendars for the two crops are very similar. Flowering periods coincides; however there is a one ten-day (dekad) delay for teff sowing with respect to haricot beans. In the case of teff, the peak expected rainfall is during flowering, whereas for haricot beans the peak is at the end of the vegetative phase. This occurrence was reflected in the contract structures.

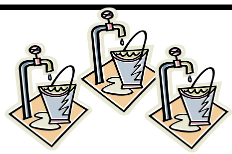
The person in charge of the collection of rainfall data at the National Metrology Agency (NMA) weather station in Bofa supported in translating the farmer's rainfall expectations into numbers. The rule of the thumb is to translate what a mm is, how it is measured, how much it is and the number of expected rainy day into mm by considering that 5mm is the minimum amount of rainfall per day that allows water to be available to the plants. For example, 20 mm of expected rainfall during one dekad implies at least 4 expected rainy days during that dekad.

According to the information gathered both through focus group discussion and available data indicated that the proposed contract would have payouts in 2002 and 2004. Farmers in Bofa reported a severe loss in 2002 and another in 2006. It was assumed that the mismatch is due to the use of data from the weather station in Sodere.

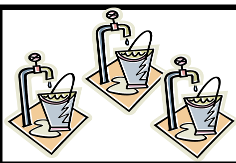
The weather index insurance contract for haricot beans had been piloted in the area of Bofa. However, only two years of rainfall data were available for the weather station that covers the area. Therefore, an accurate historical burn analysis was not feasible. In order to obtain a rough estimate of the risk

[3] In designing the product the major technical part was played by a climate scientist called Sandro Calmanti who was assigned by WFP for the same purpose.

Rainfall Deficit Computation Panel for haricot beans in Bofa

				
Date	**Rainfall [mm]**	**Expected Rainfall [mm]**	**Deficit [mm]**	**Total Phase Deficit [mm]**
Jul 1 - Jul 10		**20**		
Jul 11 - Jul 20		**25**		
Jul 21 - Jul 31		**30**		
Aug 1 - Aug 10		**42**		
Aug 10 - Aug 20		**45**		
Aug 21 - Aug 31		**30**		
Sep 1 - Sep 10		**30**		
Sep 11 - Sep 20		**25**		
Sep 21 - Sep 30		**10**		

Rainfall Deficit Computation Panel for teff in Bofa

				
Date	**Rainfall [mm]**	**Water Requirement [mm]**	**Deficit [mm]**	**Total Phase Deficit [mm]**
Jul 11 - Jul 20		**25**		
Jul 21 - Jul 31		**25**		
Aug 1 - Aug 10		**30**		
Aug 10 - Aug 20		**35**		
Aug 21 - Aug 31		**40**		
Sep 1 - Sep 10		**40**		
Sep 11 - Sep 20		**20**		
Sep 21 - Sep 30		**15**		

that would be carried by the insurer, it was used rainfall data from the nearby weather station of Sodere (distance: 15km).

By comparing two years of dekadal rainfall from the two stations it was found that dekadal cumulated rainfall in Bofa is at least 20% higher than in Sodere. Moreover, the correlation of dekadal rainfall measured by the two weather station was ambiguous (r=0.8 in 2007, r=0.2 in 2008). These features/limitations were confirmed during an informal colloquium with a person, who was appointed by NMA for collecting rainfall data in Bofa.

Scope and elements of the product

It is known that index-based insurance is a way of providing protection against correlated risk such as extreme weather events. It has also been used to protect against poorer-than-expected yields and livestock mortality associated with climatic conditions and triggered by the data from the weather stations. But this pilot project is restrained only to the protection of crop lost or damaged triggered due to deficit rainfall/drought during the policy period.

The policy is based up on the simplified version of the Water Requirement Satisfaction Index (WRSI) approach. The crop insurance is designed around particular crops and according to the WRSI and various discussions with all stakeholders the crop cycle is divided into three main phases:

Initial phase - corresponding to germination and vegetative phase – called **Bukaya**

Midterm phase - corresponding roughly to flowering called **Abeba**

Final phase - corresponding to seed formation and ripening called **Eshet**

Each phase composed of several ten-day periods (*dekads*). During each dekad of the crop cycle, the water deficit is computed and if the rainfall cumulated during a ten-day period exceed or equals the water requirement it will be taken as zero deficit. In contrary, if the rainfall cumulated during a ten-day period is less than the water requirement there will be payout for crop lost/ damaged. To serve this purpose daily rainfall data is obtained from NMA branches in the localities.

The scheme is based on "Area Approach", in which historical cost and yield data per '*timad*' (a local unit of measurement equivalent to 0.25 hectare) will be gathered and value of yield per '*timad*' will be set on the basis of this information.

Rules for the Rainfall Deficit Computation Panel

Rainfall	Ten-day cumulated rainfall. Data must be collected and validated by NMA for the selected reference station.
Water Requirement	Derived from the crop coefficient values reported in table 11 of the FAO Irrigation and Drainage Paper no. 56 and information about total water requirement provided by local experts. The water requirement estimates must be agreed before signing the contract.
Deficit	Is zero if the rainfall cumulated during a ten-day period is larger than the water requirement, otherwise it is equal to the difference between the water requirement and the ten-day cumulated rainfall. For example, if the water requirement is 40mm and rainfall is 55mm, then the Deficit is 0. If the water requirement is 40mm and rainfall is 30mm, then the Deficit is 40 mm – 30 mm = 10mm.
Total phase deficit	The sum of the water deficits recorded during the ten-day periods included in each phase. For example the total deficit for Phase II is the sum of the deficits recorded during two ten-day periods in August and September.
Total deficit	Sum of the phase deficits. Let the deficit be 30 mm during August 21-August 31, and then 20 mm during September 1- September 10. The total deficit would be 30 mm + 20 mm = 50 mm.

All stakeholders including the farmers' union and the farmers themselves were consulted frequently during development of the insurance policy, ensuring a participatory and transparent process leading to broad ownership of the pilot project.

Premium

The insurance policies were purchased by the Lume Adama farmers' Cooperative Union for 137 of their members in the Bofa area covering 159.75 hectares of haricot beans. The union used this mechanism as a pre finance part of the insurance premium as otherwise the insured (the poor farmers) would not have been able to purchase the policy against upfront payment.

In consultation with agricultural extension workers, union members and NISCO, the production cost for 1 hectare of haricot bens was set at ETB **4,000 (US $ 320),** including estimated agricultural inputs and labour costs. Based on drought probability calculations derived from available rainfall data for the area the premium was set at ETB 460 per hectare or 11.5 percent of the sum insured.

Payouts

Thanks to the Livelihood Early Assessment Protection (LEAP) approach studied by FAO and the accompanying software developed therewith, when the local Metrology station registered a rainfall deficit in any of the decades in the three crop cycles, it was possible to correlate the rainfall amount shortfall of the normal with crop losses.

Accordingly, claim settlement was made on the basis of the monetary value agreed per each '*timad*'. And each tenet received the monetary value of the crop loss in their respective holding. This rate was applied to all insured farmers across the board with ten kilometre radius from the triggering weather station. One key advantage of this system is that it involves small transaction costs and make it transparent.

Delivery Channels

NISCO has opted local farmers' union as the main availing channel of the micro-insurance products it has launched, including weather index crop insurance. Agreement on policy terms and conditions was made with the cooperative unions and all farmers who belong to the cooperative union are bind by the same contract. The cooperative union is also responsible for collection of premium and distribution of payout to individual farmers up on misfortune. Since farmers usually face constraint to settle premium at time of sowing season, the cooperative union settles the premium on their behalf and will reimburse from individual farmers during harvest season. This significantly reduces transaction cost to NISCO.

NISCO is also using Micro-finance institutions and traditional social gatherings like Ider in channelling such products to the small holding poor farmers.

In addition to protecting small holding farmers against welfare loss and accompanying undesirable outcomes, the weather index insurance scheme is also envisioned to help promote agricultural growth and productivity through the interlinking of the farmer with formal credit market by realizing the possibility of utilizing the insured expected harvest as collateral; which is subjected to repetitive shocks. This in turn encourages farmers to invest in fertiliser and high‐yielding seeds but risky varieties.

Summary of Index-based Crop Insurance Policies Issued By NISCO (Birr)

Region	Crop type	No. farmers	hectare insured	Premium amount	sum insured
Year 2009					
Oromia - Bofa	HB	137	159.75	73,490	639,000
Tigray - Adiha	Teff	200	51.25	27,500	115,000
Total		**337**	**211**	**101,085**	**754,000**
Year 2010					
Oromia	Maize	290	208	83,333.00	417,500.00
Tigrai	Teff, Wheat, Barley	1,309	147.05	357,014.39	974403.2
SNNPR	W/T/M/HB	452	199.18	73,316.14	395,860.00
Amhara	Sorghum, M & T	32	12.75	2,601.00	25,500.00
Total		**2083**	**566.981**	**516,264.53**	**1,813,263.20**

N.B: - W-Wheat, T-Teff, M-Maize and HB -Haricot bean, B-Barley, S- Sorghum

Challenges and Opportunities

Challenges

Farmers lack awareness on agricultural insurance: - There is a very low level of awareness and knowledge about agricultural insurance on the part of the farmers as well as their unions. In line with this, it requires a comprehensive & advanced marketing tool in order to create awareness and tap the huge potential demand.

Legal and regulatory framework: - Although the government promotes micro insurance still it needs a lot to be worked out on legal framework including clear directives which foster the design and development of such products. This in turn can act as a major support to the efforts of identifying ways of strengthening and standardizing micro insurance product design and rating.

Lack of reliable data to analyse risk: - data being critical to the design and rating of any weather insurance program, availability of quality, long term time series data on weather, crop production and yield is a challenge faced in developing such insurance products. In addition the country has low density of weather stations and lacks the desired time serious weather data which can be used in the design of weather index products. This in turn would make the basis risk higher than tolerable margin in most part of the country.

Inadequate Capacity Building Work: - Private insurance companies in Ethiopia have little or no exposure to international practice in weather insurance and they lack knowledge and awareness in the design, rating and implementation of such index insurance. The cooperatives and MFIs also have very limited experience with micro insurance.

Limited financial capacity: **-** Most of the insurance companies in Ethiopia are reluctant to take a lead in investing in agricultural insurance which is considered to be a high risk class of insurance. Limited financial capacity of insurers and concern about their ability to access international reinsurance are some of the major problems in this regard. The cooperative unions also usually have very limited financial reserves and they are very reluctant in settling insurance premium on behalf of their members. The poor farmers have no capacity of up front premium settlement and to make things worsen when their limited capacity is combined with the reinsurers exorbitantly high premium rate the situation gets more & more unbearable to make the product attractive to the target group.

Lack of banking credit (loan) to the poor farmers.

Farmers default:- When protection is given on credit base, farmers usually fail to settle their insurance premiums on time due to awareness and capacity limitations. This makes the sales process to be more on cash base than on credit. So getting a channel which can settle premium upfront is one of the vital preconditions in selling the product.

Limited range of Micro-insurance products: - The range of Micro-insurance products currently available are only two namely Double Trigger Multi-peril Crop Insurance and Index based crop insurance and the scope of the covers of these insurances are very limited.

Lack of rural branch networks/infrastructure. Almost all Ethiopian insurance companies' branches are located in major cities. As a result, insurers are handicapped to closely work on the majority of rural farmers in awareness creation, follow up and marketing of the product.

High administrative costs of agricultural insurance:- The land holding of most farmers in Ethiopia is 0.5 hectar and below. In addition, this is usually fragmented in to number of plots of very small size; which makes the costs of non weather index insurance delivery and underwriting and claims administration exorbitantly high.

Opportunities

Government Policy: - The under implementation (2010-2015) Growth and Transformation plan places major emphasis on small holding farmers as a major sources of agricultural growth. In view of this, an insurance scheme looking after the production variability due to weather risk is a paramount importance.

Commitment of NGOs: - International NGOs working on food security and related issues are showing keen interest in packaging the weather insurance scheme as one of the remedial measures.

Establishment of reinsurance companies domestically: - Recently both international reinsurers and domestic investors are showing interest on the establishment of Reinsurance Company in Ethiopia. This will hopefully alleviate the problem faced by local direct insurers while looking for reinsurance arrangements for placing covariant (draught) risks in the international market.

Continuing Recent Research Endeavour: - Various scholars, multilateral institutions and research centres are showing interest of conducting research on the topic and vital policy implications are expected as an outcome.

Lesson Taken so Far

The pilot project has provided various direct and implied lessons, to mention some:-

It is more efficient to use market tools-commercial means to mitigate drought risk, provided a reliable reinsurance arrangement is in place.

It is possible to make weather insurance affordable to the Ethiopian poor and marginalized farmers, if some portion of the premium is subsidized in the first few years.

Livelihood Early Assessment Protection (LEAP) approach can best be used as indicators to handle weather related insurance claim.

In order for this insurance to work, other risks faced by farmers (like access to market, access to credit etc.) need to be addressed.

In providing weather insurance products, cooperative unions, Microfinance institutions and Idirs etc. can serve as effective channel.

Investments in building the capacity of insurers, cooperative unions and establishing automated weather station infrastructure can help scale up the products at national level.

Way Forward

Based on the lesson learned from the pilot project various measures are required for the betterment of the service. The following are the major activities identified so far:-

Aggressive nationwide campaign to create awareness about the product among major stakeholders mainly by the concerned government organs and International Agencies are required. In addition, due emphasis has to be given to the task of building trust and confidence of the farmers.

Building on the already established reliable delivery channel by focusing on capacitating cooperative unions, MFI and Idirs in this regard.

Availability of quality weather data is decisive factor for the efficient & effective provision of weather related crop insurance service. This underscores the need to work on building of reliable and efficient weather station infrastructure and data system. NISCO in collaboration with IFPRI & WFP have distributed 19 & 4 weather stations respectively, to NMA and installed in different parts of the country. However, the underdeveloped infrastructural facility of the country in this regard requires much more to be done.

Agricultural insurance should be promoted as part of the national agricultural risk management framework as well as part of the Agriculture package. Way of complementing Weather insurance with other agricultural risk management activities needs to be sought. The private sector should also be encouraged to develop additional micro- insurance products and to channel them to Ethiopia poor and marginal farmers.

Close collaboration is needed between Government, NGOs, domestic insurers, farmer cooperatives/microfinance and bankers, in support of further enhancement of the project.

The product needs a detailed legal framework which includes regulations governing the development and operation of micro insurance products.

Strengthening and capacitating the existing crop insurance products and go for nationwide penetration. Additional technical assistance should be provided to the on-going small-scale programs with the view of strengthen their technical and financial features.

Insurance tied to credit access and/or technology adaptation provides farmers with a good income and makes the purchase of insurance attractive. As a result we look forwarded to work with commercial banks in helping farmers to access formal credit by using insurance product as a means of collateral against insured perils.

References

African Development Bank Group (ADBG), Ethiopian Review of Bank Group Assistance to Agricultural and Rural Development Sector, website to be included, 2008.

Central Statistics Authority (CSA), National Census Report, www.csa.gov.et, 2007

Ethiopian Economic Association/ Economic Policy Research Institute (EEA/EEPRI), A research on Land Tenure and Agricultural Development in Ethiopia, 2002.

Eyob Meherette: Providing Weather Index and Indemnity Insurance in Ethiopia, IFPRI FOCUS 17 - December 2009.

National Bank of Ethiopia (NBE), Annual Report, www.nbe.gov.et, 2010

Niels Balzer and Ulrich Hess, Climate Change and Weather Risk Management; Evidence from Index-Based Insurance Schemes in China and Ethiopia, www.wfp.org, 2009.

Prevention web ,Ethiopia-Disaster Statistics, www.preventionweb.net, 2008.

Richared Pierro and Bina Desai, The Potential Role of Disaster Risk Reduction and Climate Change Adaption, Global Knowledge for Global Change-Institute of Development Studies, www.ids.ac.uk, 2008.

Ruth Vargan Hill, Agrricultural Insurance in Sub-sharan Africa; Can it Work, Paper prepared for the Fourth African Agricultural Markets Program (AAMP) policy symposium Lilongwe-Malawi, September 6-10.

Stefan Dercon, Risk, Poverty and Insurance; International Food Policy Research Institute Journal on Innovations in Insuring the Poor, 2009.

Stephen Deverevx and Bruce Guenther, Institute of Development Studies' Universty of Sussex, Country Case Study Paper for a Review Commissioned by FAO, 2007.

Temesgen Tadesse and Reshid M. Hassen , Economic Impact of Climate Change on Crop Production in Ethiopia; Evidence from Cross Section Measures, Journal of African Economies, Volume 18 number 4, PP 529-554,jae.oxfordjournals.org,2005.

UNDP, International Human Development Indicators, www.hdr.undp.org,2010.

World Bank, Ethiopian Climate Risk Factsheet, siteresources.worldbank.org, 2007