

# Agricultural Insurance in Ghana: An examination of Concepts, Structure and Challenges.



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## ABSTRACT

Ghana has a target to achieve in the millennium development goal one by 2015 using agriculture as one of the panaceas to poverty reduction. This is because agriculture has the potential to transform the economy as it employs 60% of the labour force and in particular those in the rural areas. However, climate change threatens this objective; leaving rural households vulnerable to poverty traps.

This review sought to examine how agricultural insurance in relation to concept, structure and prospect is providing timely and relevant response to mitigate the negative impact of climate change on agricultural production. The methodology adapted for the review was largely the use of primary data and information collected through interviews and participant observation supported with content analysis of existing publication on agricultural insurance. The review has identified two key projects that have developed insurance products for farmers. These projects are Innovative Insurance Project for Adaptation to Climate Change (IIPACC) and Ghana Agricultural Insurance Pool (GAIP). These projects have developed drought index insurance and area yield index insurance for maize and soya beans for seven regions in Ghana as a coordinated response to mitigating the negative effect of climate change consequently to reduce poverty. Although, these insurance products are developed it is not clear how the farmers are responding to the uptake of these insurance products. In addition, it has been observed that these products are limited to maize and soybean farmers. It is therefore, recommended that a study should be conducted to assess the level of utilization of these insurance products by farmers. Furthermore, insurance product should be developed to cover perils that affect other crops, livestock, poultry and fisheries.

## KEYWORDS:

Agricultural Insurance, Climate Change, Poverty Reduction, Ghana

## I. INTRODUCTION

Ghana aims to become a middle income country by 2020 and this vision is dubbed "Ghana-Vision 2020". In this regard, the Government of Ghana has set forth a development strategy aimed at creating a stable macroeconomic environment and implementing a decisive structural transformation to foster strong economic growth and a broad-based improvement of living standards. In consonance with the objectives of Ghana's Vision 2020 (introduced in the late 1990s), the key policy objectives of the Agricultural sector was to use agriculture to provide food security and poverty alleviation. It is in view of this Vision 2020 of Ghana Poverty Reduction strategy was prepared to serve as a blue print to guide the nation's development agenda and each document highlighted the importance of economic growth and poverty reduction. The strategies also envisaged steps to achieve a balance between social and regional development, in order to reinforce a holistic private sector involvement with the aim to embrace an expansionary economy.

However, climate change poses a serious threat to this ambition as it is one of the biggest challenges facing majority of people in developing countries and Africa in particular. Kemausuor *et al.* (2012), in their studies of the Edjura-Sekyeredumasi District in Ghana, posited that climate change is predicted to have adverse impacts on economies of developing countries by lowering agricultural productivity. This stunning revelation is further supported by the fact that over 70% of Africa's population depends on agriculture (IFDC, 2013) which is mainly rain fed; and in Ghana, agricultural production represents one of the most important economic activities in the economy and is paramount to poverty reduction and achieving food security. This assertion is reinforced by the fact that out of a total land area of 23,853,900 ha, in Ghana, the potential agriculture land for agricultural production is 13,628,179 ha representing (57%) out of which only 7,311,500 ha representing (54%) of agricultural land is cultivated, with only 29,804 ha reflecting (0.2%) being irrigated farmlands, and the rest are largely rain fed (MOFA, SRID, 2011, IFDC, 2013). This brings to the fore that the sector's dependence on rain-fed agriculture which comes with its own complexities and ramifications because of the threat of climate change.

Wenner (2005), from an economic perspective, captured the negative effect of these changes on farming households at both micro and macro levels. In his analysis, he succinctly opined that at the micro level, the negative effect is manifested by farmers withdrawing accumulated savings, seeking loans, reducing their consumption, including food intake and withdrawing children from school's nutritional threshold resulting in impaired health, liquidating their assets, depending on remittances, depending on informal reciprocal sharing arrangements with neighbours, and seeking off-farm employment. The Macro effects he argued come in the form of seeking debt forgiveness for existing formal loans, petitioning government authorities for emergency relief, exiting farming permanently and migrating to urban areas. If all these persist over time, then agricultural productivity will be reduced and subsequently affects the economic activities at the Meso level which constitute aggregators including financial institutions and input dealers that are into agriculture development and promotion.

The imminent threat climate change poses to Ghana's agriculture is its potential to disrupt rural livelihoods through increased temperature, moisture deficit, land degradation, water shortage and increased incidence of alien diseases and pests with its concomitant adverse effect on agriculture which is the mainstay of the Ghanaian economy employing about 60% of the labour force mainly small-holder farmers; most of which rely on rainfall for agricultural production (IFOAM, 2003).

This is why the threat of climate change and its attendant negative spill-over effect must be a source of worry to government and rural households, as if left unchecked will tend to undermine Ghana's poverty reduction strategies owing to the fact that Ghana's agricultural productivity continues to be rain-fed and vulnerable to a range of climatic hazards notably droughts,

excess rainfall, floods, pests and diseases as well as natural hazards like bushfires and localized windstorms. Besides, Ghana's agriculture has over the years been severely affected by a number of catastrophic weather events especially in years like 1983, 1997, 2002, 2007 and 2009 where droughts, floods and bush fires occurred in several agro-ecological zones and in many a farming community in the Northern region of Ghana; whilst other areas have also experienced flood exposures due to excess rainfall and floods due to overflow of river banks in recent times.

Such extreme climatic conditions usually cause severe damages to cereals, food crops like maize, rice, etc. as well as cash crops like cocoa, mango, banana and cashew plantations (Stutley, 2010). The negative impact of climate change becomes more pronounced when it is quantified in monetary terms : about 5.5% (US\$228m) of the national value of the production of principal food crops such as maize are lost each year due to a combination of all climatic, biological and natural perils (ibid). To bring to the fore that further losses may be incurred if the right mechanisms are not put in place to quell climate change related risk, a study in Ghana on Agro ecosystem adaptation to climate change reported that the mean daily temperatures in the whole universe are expected to increase by 3O<sup>c</sup> while rainfall will decline between 9% and 27% while the mean daily temperatures will rise by 2.5 O<sup>c</sup>– 3.2O<sup>c</sup> by 20100(Mania, 2004).

Such unprecedented increase will have innumerable impact on various human systems (Kemausuoret *al.*, 2013). The attendant effects of climate change which include higher temperatures, intensity of droughts and floods will pose climate related risks for the poor and vulnerable households who depend on subsistence agriculture as their source of livelihood (Stutley, 2010).

Clearly, climate change and its variability are threat to poverty reduction and food security as agriculture and forestry would become particularly vulnerable and this also undermines Ghana's ability to achievement of the Sustainable development goal one and eight which seeks to: end poverty in all its forms particularly those who live on less than 1.25 a day everywhere by 2030, and also seek to promote inclusive and sustainable economic growth, employment and decent work for all.

Kemausuoret *al.*(2013) and DIFD(2004) noted that climate change impacts include natural perils such as changes in rainfall patterns; extreme weather occurrences such as droughts, floods; shifting temperature zones affecting vector diseases with its attendant cost that may be beyond the farmers' control; resulting in and ultimately undermining the achievement of the millennium development goal one. The end result of this being low economic growth and the inevitable use of agricultural insurance as a mitigating tool.

To suppress the repercussion of climate change and to provide the enabling environment for economic growth and development, various models that have been applied to mitigate the effect of climate change still display gaps in addressing two climatic related challenges: Global warming and uncertainty in the pattern of rainfall. The unpredictability of the increase or decrease in rainfall makes it difficult sometimes for farmers to plan their crop calendar within growing seasons with accuracy.

Though climate change is undesirable and poses serious challenges to rural households, it also presents insurers with an opportunity to develop and market agricultural insurance to farmers in order to absorb the income shock that climate change related risk might foist on these farmers.

This at once brings to the fore that a coordinated climate change response and schemes that are hinged on climate change adaptations have become absolutely critical and paramount in helping communities in Ghana reduce its impact on agriculture so as to attain poverty reduction as well as a shrinking hunger gap which then ensures food security. This is because, to the national GDP, agriculture contributes 34% which is a chunk of the country's GDP (Stutley, 2010).

In order to address these key challenges and to augment the works of other researchers on coping and adaptation strategies, this paper discusses the use of agricultural insurance as one of the panaceas in mitigating the effect of the gaps with regards to uncertainty in the climatic or weather patterns emanating from climate change related risk ex-ante and post-ex.

The rest of the paper has been divided into four (4) sections, the first section presents concept of agricultural insurance, followed by the examination of the structure of agricultural insurance in Ghana, and the third section presents the challenges faced by the agricultural insurance sector in Ghana. This is followed by concluding remarks and policy implications

### Definition and Concept of Agricultural Insurance

According to Agricultural Insurance Company of India (2008), agricultural insurance is a means of protecting the agriculturist against income shocks due to uncertainties that may arise from a named peril or all unforeseen perils beyond their control. Raju and Chand (2008) maintained that agricultural insurance is an important mechanism to effectively address the risk to output and income resulting from various natural and manmade events. Agricultural insurance plays the role of indemnification of risk-averse farmers who might be adversely affected by natural probabilistic phenomenon.

Mahul and Stutley (2010) on their part contended that agricultural insurance is part of a comprehensive risk management framework; it can contribute to the modernisation of agriculture. According to Livate (2009), agricultural insurance offers financial protection or cover for agricultural producers and others in the agricultural value chain to protect themselves either against the loss of their crops due to natural disasters or from climate change related perils such as drought, flood, excess rainfall or the loss of revenue due to decline in prices of agricultural commodities. From the aforementioned definitions and concepts, it can be deduced that agricultural insurance is not the only solution to farmers' risk mitigations strategies, but can also be used to normalise the effects of extreme shocks emanating from uncontrollable risks such as climate change.

Hence, it represents one of the methods by which farmers can stabilize their farm income and investment and guard against the disastrous effect of losses due to natural hazards or low market prices. Furthermore, it does not only stabilise the farmers' income but also helps the farmers to initiate production activity as it simultaneously cushions the shock of crop losses by providing farmers with a minimum amount of protection.

It is in the light of this, that Roberts (2005) succinctly opined that agricultural insurance should cover losses arising out of perils beyond the control of farmers- a phenomenon Wenner (2005) referred to as residual risk.

In analysing the philosophical underlings of the development and promotion of agricultural insurance, Ahsan *et al.* (1982) reported that the philosophy of the insurance market is based on the law of large numbers. According to this law, the incidence of risk is distributed through risk pooling and this affords individual farmers or farming households the possibility of sharing their risks with others while enabling them to engage in risky farming activities which they would not undertake without insurance.

Wenner (2005) reinforced this view when he succinctly opined that agricultural insurance is based on the statistical law of large numbers which is the actual model to calculate coverage, underwrite risk and determine risk premium. This law states that the more uncorrelated risks are added to a portfolio, the lower the variance of the outcome for the entire

portfolio. Similarly, agricultural insurance for climate change related perils would also be a risk transfer mechanism and a rational decision that would play a major role in indemnifying risk averse farmers to offer them the possibility of shifting risk to enable them engage in risky decisions regarding their objective and productive functions (Ansan *et al.*, 1982).

In view of the aforesaid, it stands to reason that the overall idea behind agricultural insurance is risk pooling which involves the contribution of risk faced by many a large number of farmers to contribute their premiums to a common fund which is used to cover the losses incurred by any individual farmer who is part of the pool (Bielza *et al.*, 2011).

It is instructive to note that no matter the differences in jurisdictions in which agricultural insurance contract are designed, these core elements are normally present:

1. The insured pays a sum of money (premium) to the other party (insurer)
2. In return for premium, the insurer agrees to accept the risk of an uncertain event occurring at a future time.
3. The insured must have an insurable interest in the subject matter of insurance.
4. The insurer must agree to indemnify the loss.
5. The insurance content has a specified period.

Apietu-Ankrah (2008) concluded that developed countries have seen significant improvements in their economies because the insurance industry contributes immensely to economic growth by converting savings made by individuals into assets. Since the funds raised by the industry are long term in nature, it makes it the most critical fund for economic development; similarly, agricultural insurance premiums and reserves can also be channelled into agricultural development in order to transform the sector.

### The Structure and Operations of Agricultural Insurance in Ghana

It is worth stressing that from time past up to 2011, Ghana had no formal agricultural insurance schemes that offered actuarially fair insurance products to protect farmers from climatic risks related to their farming activities. Though some farmers in some selected communities in the Northern region of Ghana had received some form of protection on experimental basis by purchasing agricultural insurance known as Takayuya, a product offered by the Innovation for Poverty Action (IPA) -a research organization that works with farmers mainly in the three northern regions of Ghana (IPA, 2008, 2009, 2010)-, this insurance product was designed as part of a research that examined underinvestment in agriculture in those selected communities to cover drought and flood and was offered not at an actuarially fair price to the farmers.

IPA offered free insurance cover to 260 farmers who voluntarily opted to participate in the Takayuya a rainfall index insurance research project. In 2010, IPA introduced a series of differential premium rates to check farmers' ability to afford and willingness to pay for crop insurance premiums. A series of premiums were introduced ranging from a nominal GHS1 per acre for a maximum pay-out (sum insured) of GHS 100 per acre (1% premium rate) to a maximum of GHS 14 per acre (14% rate) (Stutley, 2010; IPA, 2008, 2009, 2010).

These rates are comparable with an actuarially fair rate of about 8% to 10% for the excess rainfall/rainfall deficit product (Stutley, 2010).

In 2010, an International Cooperation's (GIZ) project known as "Innovative Insurance Products for the Adaptation to Climate Change" (IIPACC) was initiated to support Ghana in tackling the socio-economic costs and risks associated with



climate change and in particular the variability in rainfall patterns in farming communities in Ghana (Stutley, 2010). This began with IIPACC feasibility studies in March, 2010 in Ghana. The feasibility studies looked into commercial viability by quantifying the demand for crop insurance. The study identified the potential to develop several agricultural insurance products, e.g. conventional indemnity-based (named-peril for rubber, banana, plantain and mango; aggregate excess of loss for cocoa) and innovative index-based (weather-index for groundnut, maize, millet, rice and sorghum; and area-yield for groundnut, maize, millet and sorghum) products.

The study indicated that a high proportion of farmers were willing to pay a nominal premium rate of GHS 1 per acre (88% of farmers to whom cover was offered at this price) and GHS 4 per acre (72% of farmers). The study also showed that a relatively high proportion of about 40% of farmers were also willing to pay actuarially fair prices of between GHS 8 and GHS 9.5 per acre and even at a high rate of GHS 12 per acre, nearly 1 in 5 farmers (19%) were still willing to purchase insurance (Ibid).

From the foregoing, the study reinforced the fact that climate change related risks and perils such as drought can be addressed through the use of a weather index insurance which has a strong potential to address their impact on crop yield under rain-fed conditions and also to prevent rural households' dependence on rain-fed agriculture as a source of their livelihood from falling into what Wenner (2005) describes as the poverty trap: a situation in which households affected by weather-related risk such drought are not able to recover from their income shocks and consequently pass it on to the next generation.

The structural building for the program started with the formation of the Steering Committee of the Ghana Agricultural Insurance Program which has the mandate of providing policy and advocacy directions for the development of agricultural insurance in the country. This Committee was made up of relevant stakeholders, both public and private, that had to contribute to ensure an effective delivery of agricultural insurance in Ghana. Representatives of the public sector on the Committee included the National Insurance Commission (NIC), which is the regulator for insurance provision in Ghana, the Ministry of Finance which oversees all financial programs and policies in the country and the Ministry of Food and Agriculture which provides policy direction and other services aimed at improving Ghana's agricultural production. Also, part of the public sector representatives were: Agricultural Development Bank, Ghana Reinsurance Company as well as the Ghana Meteorological Agency (GMet). Private sector representatives on the Steering Committee included the Ghana Insurers Association (GIA) which is an association of all insurance companies in Ghana, the German Development Cooperation, World Bank, Stanbic Bank representing the banking sector in addition to representation of farmers. It is worth noting that individuals from these institutions had been meeting periodically to engage in discussions to provide direction for the development of agricultural insurance in Ghana.

Additionally, the activities of IIPACC and NIC culminated in the establishment of a public-private partnership approach to tackling the climate change related risks resulting in the establishment of Ghana Agricultural Insurance Program (GAIP). This program was made up of 19 non-life insurance pledging 5% of their underwriting capital, with Swiss-Re providing reinsurance support in a Quota-Share treaty in which Swiss-Re was to take 60 % of the risk premium and the remaining 40% going to the pool. This kind of arrangement also meant Swiss-Re would also bear 60% of the liabilities in event of claims. This also resulted in the formation of a Pool Management Board made up of CEOs of Giant Insurance Companies such as Ghana-Re, SIC, Met Insurance, Enterprise

Insurance to govern the Technical Management Unit (TMU) which is the operational body of the pool. They were also supported by a Technical Committee made up of selected experienced practitioners from in 2011 to implement a commercial agricultural insurance system on a pilot basis.

The mandate of the Agricultural Insurance Pool (GAIP) in conjunction with IIPACC was the introduction of agricultural insurance solutions for farmers in the form of innovative, demand-oriented and economically-sustainable agricultural insurance products intended to protect farmers, agro-processors, financial institutions, and input dealers among others, in the event of crop failure due to extreme weather conditions.

This was done to harness the opportunities that climate change brings to the insurance industry and to also serve as a coordinated response to address the negative impact on the farmers' livelihood to foster poverty reduction in order to achieve the Millennium development goal one.

This type of solution undoubtedly provides a win-win situation for farmers and insurers in Ghana, with German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety funding the IIPACC project and Ghana Insurers Association (GIA) funding part of the operations of GAIP.

The first Weather Index Insurance (WII) for the maize crop was underwritten on a pilot basis and rolled out in the Northern, Upper East and Upper West Regions for maize during the crop season which started in May 2011 (Zeney, 2011). Three financial institutions: Stanbic, Bangmarigu Community Bank Limited and Bonzali Rural Bank Limited and one other research-based organization operating in the Northern region, Innovations for Poverty Action (IPA), acted as policy holders for over three thousand farmers covered (Ihmire, 2011).

The initial focus for the roll out was on bank portfolio protection what was termed by GAIP Board as a Meso level Approach (MLA). The pool currently offers products from the two main types of agricultural insurance products which can be used to protect farmers from agricultural risks: index insurance and named peril damage-based. The index insurance products are specifically, weather index insurance for maize, soya, rice, sorghum and millet. In index insurance product design, indemnities to the investments in the farm are based on the realised value of a pre-determined index rather than farm-level losses (World Bank, 2007).

The index is an easy-to-measure variable (eg. Temperature, Wind speed, Rainfall, Sunshine, Humidity, Measured Yield) that highly correlates with the loss or success of the particular crop being insured. The movement of the index is therefore chosen as the basis for determining whether the farmer has experienced loss and so should be compensated or has had a successful season and so should not be compensated. There are two main forms of index products available under the Ghana Agricultural Insurance Program (GAIP). The first is the weather index insurance product. The Weather Index Insurance covers dry spells hence is known as drought Index Insurance and was implemented on a conservative scale with total insured area of 4,045 hectares, Total sum Insured (TSI) of GHC 442,654 (average rate 7.5%). The program was free of pay-outs or claims in 2011, that is, it had a 0% loss ratio (GAIP, 2013).

The weather index is normally used to insure farms using rainfall estimates measured by the Ghana Meteorological Agency (GMet) at a weather station as the basis for determining whether the farm insured within a determined radius around a particular weather station has experienced drought or not. During the scale-up phase in the 2012 farming season, the weather index program had been expanded to seven (7) regions; which apart from the three Northern regions included the Ashanti, Brong-Ahafo and Eastern regions.

Efforts were also made to the customer base to include some commercial farmers and many more not-for-profit Organizations and more sensitization and capacity building workshops for stakeholders were carried out in 2012 in order to increase the level of awareness. In addition, a pay-out to farmers to 136 farmers of IPA (Innovations for Poverty Actions) Maize and Soya in Tamale and Pong-Tamale in October, 2012 in the northern regions (GIA, 2012) was also undertaken.

An in-depth interview with stakeholders of Ghana Agricultural Insurance Pool to investigate the motive of purchase of agricultural insurance by banks in 2013 revealed that the bank bought it to cover their own agricultural-portfolio on an experimental basis in order to ensure it was safe, before they introduced it to their clients; mainly farmers who normally take loans to cultivate cereals such as maize.

The second is the Area Yield Index (AYII) product which insures farms based on the district average yield estimates measured by the Statistics, Research and Information Directorate (SRID) of the Ministry of Food and Agriculture (MoFA) as the basis for estimating the losses or gains to the farmers in the particular district. This product is available for farms with similar characteristics around a particular area and specifically in three selected pilot districts in the Upper West region of Ghana.

Premium rates for index insurance products are cheaper compared to other forms of agricultural insurance particularly, the indemnity-based crop insurance products. This is because it comes at a lower operating cost resulting from the absence of on-farm field loss evaluation costs. Every judgment is based on the index which is measured by an individual body as part of its regular activities. There is also a lower moral hazard resulting from the inability of the single farmer being insured to do anything that would impact on the index at the regional level or the insurance company directly altering the values of the index to let it suit their interest (Miranda and Farrin, 2012). There is however the disadvantage of basis risk which occurs when the index triggers a claim when the farm actually does well or the farm experiences loss that are not recorded by the index (Doherty and Richter 2002). There can therefore be pay-outs when there has been no loss or losses but no pay-outs because they have not been captured by the index (Hellmuth *et al.*, 2009). This can negatively impact the success of the program (Skees, 2008). To overcome this difficulty, the pool has in place the alternative of pricing the weather index insurance product making use of increasingly available satellite-based weather measurements; but these also introduce additional problems with both accuracy and transparency as well as the ease with which the product could be easily explained to the ordinary farmer during the product marketing and sensitization sessions (Burke *et al.*, 2010).

The team also offers on demand the second form of agricultural insurance products known as the traditional indemnity-based crop insurance product. This is usually available to commercial farmers who have appreciable years of production and sales data and large hectares of farms. They have protection for both the single peril and the multiple peril and aggregate loss of investment in cases where the farmer can provide substantial amount of time series data on his production and sales.

Under named-peril damage-based indemnity insurance, physical loss or damage to the insured crop is measured in-field soon after a specific loss event due to an insured peril has been experienced and the claim is usually settled shortly after the time of loss (Stutley 2010). This kind of insurance product according to the World Bank (2007) has been the first crop insurance product offered in many countries. This kind of insurance product has some advantages over the index product in that there is an on-farm measurement which can establish actual losses on the farm leading to a compensation of the farmer in accordance with the loss that he has suffered. This

type of insurance can be provided for windstorm and other measureable perils to crops such as cashew, rubber and banana as well as identifiable perils to cocoa. There is therefore no basis risk in this case. The premium rate for this product is however higher than that of the index insurance. This is because the cost of carrying out the field assessment is passed on to the farmer in the form of increased premiums. This type of insurance also exposes the insurance companies to moral hazards resulting from the farmers intentionally creating the factors that would lead to losses and putting in insurance claims (Miranda and Farrin, 2012).

The above mentioned products can be purchased for now by Meso level clients such as financial institutions that lend to agricultural players, Input dealers, NGOs that offer support to farmers and farmer-based organisations and associations. Large scale farmers can also purchase the products on their own. It can therefore be said that the Ghana Agricultural Insurance Pool has successfully worked at developing insurance products for all stakeholders in the agricultural sector that provide support for the insured crops as well as farmers who cultivate those crops. The products have been offered to different clients in the agricultural sector. They include small-holder farmers, Meso level clients such as banks and non-governmental organisations and input dealers. The development of the product has also been accompanied by an intensive sensitization and education of targeted clients as well as the general public on agricultural insurance in general and the products that are available to farmers in Ghana.

To conclude on the prospects that exist with regards to product development for commercial farmers, organisations like Agrimart, DarlowGh Limited, Cocoa Abrabopa, have approached the TMU to develop insurance products for organic storage systems, drought insurance for cocoa, and products for vegetables as well.

### Strategies and Challenges faced by Agricultural Insurance in Ghana

Like any other agricultural insurance program in the world, the Ghana Agricultural Insurance Program has been dealing with some realistic challenges. Regardless of the plethora of success chalked by the Ghana Agricultural Insurance Pool, the banks opted out in spite of the numerous training workshops held for the banks as well as follow ups, and the total land size insured decreased from 4,045 hectares to 769 hectares in 2012(GAIP, 2013).

Moreover, collaborations with NGOs also did not yield many results. Furthermore, most of these activities hover around the cereal crop farmer as an interview with GAIP revealed that the number of farmers who received a pay-out were more for soya farmers than maize farmers.

Some of the challenges also included but were not restricted to limited access to consistent and reliable data and information system with the Ghana Agriculture insurance system. Like any insurance system in the world, the pool makes use of climatic, agronomic and production data among others in designing insurance products especially pricing as well as monitoring the insured farms (Burke *et al.*, 2010). Insurance providers would also benefit from the existence of a farmer database as well as the risk profiles of crops in each location for which the insured product is to be provided. In the case of Ghana, as in the case of other particularly less developed countries, this data is not readily available and accessible (World Bank, 2007; Burke *et al.*, 2010). In situations where they are available, they have not been cleaned, packaged and stored in a way that would make it easily usable without a lot of cleaning and interpolations particularly where there are data gaps, are done by the TMU of the Pool. This, therefore, forces the Pool to spend so much of the resources conducting research for data or cleaning already existing data to make them usable in designing the insurance products. The situations, therefore, have been that of cleaning and working with current existing data paid by clients (Miranda and Farrin, 2012).

A major factor driving the expansion in agricultural insurance provision across the world has been active government participation (Burke *et al.*, 2010). The government provides certain essential services like the regulatory framework, infrastructural support, enhancement of existing data and generation of new relevant data as well as provision of funds for implicit and explicit subsidization of insurance premiums as is the case in USA, Spain, China, Brazil, Canada, India, Malawi, Mongolia, Senegal and Nigeria (Mahul and Stutley, 2010; Burke *et al.*, 2010; Smith, 2011). All these go to reduce the cost of setup and operation making premium affordable and define the clear guidelines for offering the agricultural insurance products (Clarke *et al.*, 2012). The role of the government in the provision of agricultural insurance in Ghana, however, can be judged to be less active. The government, even though have been participating in the policy discussions through the MoFA and MoFEP, have not made substantial investment in providing infrastructure, developing legal framework and providing funds for subsidizing the cost of product development and premium rates.

Another major challenge facing the provision of agricultural insurance is the low level of awareness among farmers coupled with a negative perception about insurance among the populace. Most of the farmers with whom the program dealt knew nothing about agricultural insurance until they came into contact with GAIP. In this light, it would be necessary for government, via the use of its agencies and departments, to be actively engaged in public awareness and sensitization as well as capacity building during the early stages of crop insurance market development (Ucak and Berk, 2009). Very often, crop insurance or even general insurance is not very well understood by rural farmers and therefore these kinds of efforts are critical to ensure that farmers understand the advantages and disadvantages of different crop insurance products (World Bank, 2007). The government can also by regulation make agricultural insurance topics part of financial literacy programs, school curricula as well as part of any campaign on social protection carried out in the country and also a requirement for financial institutions that provide agricultural loans and credits.

So far, the design of insurance products, sensitization and sales has been largely driven by GIZ-IIPACC and Ghana Agricultural Insurance Pool (GAIP) collectively known as the Ghana Agricultural program. In spite of the IIPACC-GIZ collaborations with GAIP, it is normally fraught with conflicts arising mainly as the result of goal incompatibility and this needs urgent attention to scale-up and sustain the program in future. While GIZ is a non-profit making organisation, Ghana Agricultural Insurance Pool exists to make profit and this difference results in conflicts that have adverse effect on sales and marketing. This partly accounts for the sluggish sale performance of the pool with the weather index insurance products.

### Concluding Remarks and Policy Implications

To ensure the sustainable agricultural insurance programme and to protect the Ghanaian farmer from falling into poverty traps emanating from climate change related hazards, the program is working towards enhancing government involvement in the development of insurance schemes to mitigate the effect of climate change in Ghana. To this end, there have been discussions with MoFA top officials aimed at looking at meaningful ways that the government can assist in the sensitization and education of the general public on the insurance scheme. This would reduce the cost of marketing associated with the product and also raise the level of demand for agricultural insurance in Ghana. The team is also soliciting government assistance in the area of infrastructural support to procure more automated weather stations and other ancillary equipment for field officers who are involved in the collection of data that is used in the development of the insurance products. Again, there are discussions on the need for government to support insurance companies by subsidizing the administration

cost of the insurer and also provide subsidies to farmers who seek cover for agricultural risks.

The team is also working towards building the capacity of the local insurance industry in general to position them to provide ready staff who would work towards expanding the program. To achieve this, fifty (50) selected members of staff from the pool member companies have been trained to act as marketing champions so as to expand the distribution channels.

To enhance data collection techniques, GIZ has procured and provided support for the installation of 38 automated weather stations that would be operated by the Ghana Meteorological Agency. A database management system is also being provided for the GMet to enhance their data processing system.

To ensure data integrity and quality and to ensure it is available to the insurance pool at the right time from SRID for insurance purposes, GIZ has also procured office and field equipment for use by officers of MoFA-SRID in selected districts in the Upper West region of Ghana for the pilot of area yield index insurance before it is rolled out on a large scale if the pilot is successful. This intervention would strengthen data collection, processing, storage and transmission to enhance its suitability for designing agricultural insurance products more explicit, affordable and also be adopted as a tool for mitigating risks associated with climate change.

Currently, the pool is expanding its operations to embrace the development of products to cover perils that affect other crops, livestock and fisheries. In this regard, specialized trainings provided by international experts in the identified products would be offered to staff that are currently designing and selling the insurance products to make them competent enough to meet the anticipated demand.

However, the strategic alliance between GIZ and GAIP needs to be re-defined to draw a clear objective for sales. Again, some phases of the collaboration should be decoupled and a clear distinction should be drawn between the project phase and business phase. Hence, GIZ could assist up to product development while Ghana Insurers Association (GIA) with the help of NIC markets the insurance product.

Based on the oral interviews, focus group discussions held with stake holders as well as various information gathered from participant observation techniques, it is worth recommending the following for successful and sustainable scale-up of the Ghana Agricultural insurance programme in order to mitigate the effect of climate change with a positive spill over effect on poverty reduction. There is an urgent need to embark on more product development and innovation to offer a wide range of product to prospective clients. Many agro-based organisations and farms have approached the TMU to develop agricultural insurance products to cover their risk. The demand for excess rain fall insurance exists, since in some parts of the Upper West region, clayey or loamy soils easily get flooded and farmers in these areas rather experience flood instead of drought. Consequently, the programme should either design a separate policy for excess rainfall or bundle it with the existing product so as to widen the coverage.

The programme should increase awareness both in print media and television to augment the radio programme which has started. Adverts with testimonies from nucleus farmers who received pay-outs as well as testimonies from /National Best/Regional best farmers could also be used to endorse the products in television adverts in languages the stakeholders would understand. The selected weather stations should be published in the news print for the attention of Stakeholders.

The National Commission for Civic Education (NCCE) should be used as a medium to educate farmers in order to generate leads for marketers of GAIP.



One of GAIP's key priorities should be to advocate the need for the registration of small holder farmers and their fields in other to come out with a data base for these farmers and farmer-based Organisations (FBOs) or on the contrary, GAIP could come out with a programme to put the farmers into groups in order to qualify them for insurance purposes.

The Ghanaian Industry should build capacity in terms of the number of staff for the TMU in future or the Pool Member companies should assign staff to Agricultural Insurance and also come up with a framework for marketing.

Targets should be set for pool member companies on Agricultural insurance for them to give it the needed attention. Roll ups, stickers and brochures should be placed at vantage points of pool member companies to alert the insuring public that they can buy agricultural insurance products from GAIP to mitigate effects of climate change.

The Pool should aim at developing other products to cover perils that affect other crops, livestock and fisheries. In view of this, specialized trainings should be provided by international experts to staff who are currently designing and selling the insurance products to make them competent enough to respond to the anticipated demand.

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