



Technical Workshop

Agricultural Insurance in Sri Lanka – Building a Knowledge Network and Partnerships

9 March 2018



International Water Management Institute (IWMI)

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Executive summary

The frequency and severity of extreme climate events are increasing the world over (IPCC 2014). The devastating effects of such events are intensified in areas where there are high rates of poverty and limited resources and capacity for disaster recovery.

Risk sharing and transfer instruments like insurance are contributing to the efforts of governments and households to reduce immediate and long-term financial impacts associated with extreme weather events. These could go beyond supplying post-disaster liquidity for relief and reconstruction measures to also support ex-ante measures that reduce vulnerability. Resilient climate risk management that involves a balanced mix of approaches could also introduce insurance solutions as part of an 'integrated climate risk management' approach.

The international community recognizes risk management and insurance as a means to managing climate-related risks during major global climate negotiations. Several initiatives have been taken by organizations to develop a comprehensive risk management framework that includes risk transfer tools such as insurance to address the loss and damage caused by extreme climatic events.

Institutions are now placing considerable importance on agricultural risk management (ARM). The experience and knowledge gathered over the years could be used to develop more comprehensive strategies to cope with the risks faced by the agriculture sector. But insufficient knowledge transfer between countries, lack of a structured collection of lessons learned from management systems, as well as low uptake of innovations in ARM constrain development of such strategies.

Organizations involved in these initiatives in Sri Lanka include national (the Ministry of Finance, National Insurance Trust Fund [NITF], Disaster Management Centre [DMC], Institute of Policy Studies of Sri Lanka [[IPS] and SANASA Federation Ltd.) and international (International Water Management Institute [IWMI], World Bank/Global Facility for Disaster Reduction and Recovery [GFDRR], and the International Labour Organization [ILO] of the United Nations [UN]).

Within this context, IWMI, in collaboration with Epic Lanka, Fairfirst Insurance and other partners, identified the need to foster an exchange of knowledge and bring together the experiences on ARM available in Sri Lanka.

The partnership aims to develop a more structured collection of data on good practices and lessons learned in ARM for the use of local policymakers and rural development practitioners. It also identifies the necessity of exploiting synergies among relevant development organizations to promote private sector partnerships that would generate greater impact for the insurance research community in Sri Lanka.

A workshop on Agricultural Insurance held on Friday March 9, 2018 at the International Water Management Institute (IWMI) headquarters in Pelawatte, Battaramulla, took the initial steps towards achieving these aims. About 45 professionals from the public, private and development sectors involved in areas of insurance and research attended the sessions.

Workshop objectives

- To assemble the ARM stakeholder community around a shared vision and consensus framework to understand the contribution of insurance to agricultural and rural development, and set adaptation goals.
- To devise a toolkit, including setting out the critical steps needed to integrate insurance approaches into national risk management planning, which takes into consideration existing challenges and limitations and identifying ways to overcome the,.
- To take stock of the relevant expertise and approaches across the agencies in Sri Lanka and build specific projects in ARM.
- To explore the potential benefits of using weather index insurance and information and communications technology (ICT) to support development of the micro-finance and microinsurance markets in Sri Lanka.
- To discuss the potential for scaling up in Sri Lanka, the ongoing index-based flood insurance (IBFI) initiative implemented in India by IWMI.
- To present the concept of an automatic flood warning and forecasting system, using the Kelani river as a pilot project, to share flood warning information with insurance firms and other key stakeholders.

Index based flood insurance

Most South Asian countries are impacted by flood events annually or at least once every three years. Globally, the number of people exposed to a 100-year flood was estimated to be 805 million in 2010. This could increase further in the next decade. In Sri Lanka, a total of 33 flood events were reported between 2000 and 2017, with 8.736 million people affected and economic losses amounting to USD 2.042 billion (EM-DAT 2018).

Traditional flood-risk management initiatives have focused either on engineering responses such as dams and flood walls, or on rebuilding activities and compensation after the event. In recent decades, however, a broader approach has been identified that could significantly reduce flood losses through planning and building regulations as well as early warning systems. Index-based flood insurance (IBFI) is one such solution that is both cost-effective and equipped to target post-disaster relief to compensate agricultural losses.

A multi-disciplinary approach brings together various activities to help understand the complex issue of flood and disaster recovery. IBFI is an innovative technological initiative that integrates hi-tech modelling and satellite imagery with other data to predetermine flood thresholds. This information could be utilised to develop insurance products for people living in flood prone areas. It has the potential to help millions of people safeguard their livelihoods from the impacts of natural disasters because of its ability to assess the risks and damage caused by floods, enabling swift compensation pay-outs. The initiative has been successfully introduced in several parts of India.

More details on the project can be referred here <http://ibfi.iwmi.org>

Workshop proceedings

SESSION 1

Opening session

In his welcome remarks, **Research Group Leader, Water Risks and Disasters (WRD), Giriraj Amarnath**, commented that huge sums had been paid out on loss compensation during the recent flood disasters in Sri Lanka and emphasized the need to look at the technology that could be offered to address financial losses through development of robust risk transfer solutions using science-based data sets in developing knowledge-based insurance products and services.

He outlined the objective of the workshop. Index insurance initiatives were not new to the CGIAR system and were designed five to six years previously and are already being implemented in Asia, Africa and South America. The workshop is to be an open platform for ideas and discussions, and although a specific product was not being launched today, he hoped such a scenario would happen in the future.

Opening remarks

Director General, IWMI, Claudia Sadoff said the sessions tie in with two CGIAR programs which IWMI is involved in, namely, [Climate Change, Agriculture and Food Security \(CCAFS\)](#) and the [Water, Land and Ecosystems](#), which focus on climate change and safety nets. Across both programs, IWMI support a range of efforts to develop effective climate information and advisory services for farmers and importantly, for climate informed safety net innovations like what is being discussed at this workshop. IWMI implements these programs in countries in which it works by partnering with the CGIAR system and national institutions. A case in point was development of an Index Based Flood Insurance (IBFI) scheme working with insurance partners in India. The program uses remote sensing data with flood modelling to generate information on the duration and depth of floods. This information is then compared with historic norms and data and is used to calculate the threshold at which crop damage is believed to have occurred. When this threshold is passed, farmers receive payments directly into their bank accounts by their insurers.

*“No matter how well we predict climate extremes, no matter what we build in terms of reservoirs and irrigation schemes, extreme weather events will harm farmers. In order to protect these farmer and ensure that incentives continue for investment so that farmers thrive agriculture and food security is strengthened and so that the economy is driven by agriculture, insurance has to be an essential tool in the context of safety nets” said **Claudia Sadoff, Director General, IWMI***

IWMI is also working to develop crop advisory services for insurers to provide more precise and more easily accessible information on adverse weather conditions. This can directly benefit smallholder farmers as part of the Indian PMFBY (Pradhan Mantri Fasal Bhima Yojana) program, which uses high technology, innovations and tools for social empowerment and transparency.

Today’s sessions will explore the advanced technology applications from satellite data, crop modelling, electronic data and cloud solutions to promote science-based crop insurance solutions for sustainable public-private partnerships in agricultural insurance. Today’s dialog convenes national and International

experts to discuss ICT early warnings, insurance products, policies, planning and institutional imperatives that are essential for scaling up crop insurance and agriculture risk insurance in Sri Lanka. These are innovative tools that will become more important with climate change.

Chairman and MD, Epic Technology Group, Nayana Dehigama. The company contributes to society through its research arm, Epic Research and Innovation, which focuses on research with a view to using innovative technology to solve social problems. A recent highlight is a pioneering product designed to provide alerts on potential floods. It will mitigate the impact of flood disasters by giving advance warnings to enable people to move to safer locations with their property. Fairfirst Insurance came forward to support the project with IWMI's technical support and guidance.

This partnership would substantially improve the output of the company's research, in line with its vision to create a delightful society through providing innovative services to the highest satisfaction of partners and society.

Managing Director and CEO, Fairfield Insurance Ltd., Sanjeev Jha. Adverse weather conditions are an important issue today. Key areas that must be addressed are the climate change impacts on society, and the environmental effects of an ageing population that will outlive the previous generation by about 50 years. The insurance industry must meet these issues head-on but doesn't have solutions as yet.

The challenge in agricultural insurance is to determine which cost should be addressed, whether insurance should be based on the input cost, output cost, cost of fertilizer or cost of time spent. The types of risks covered must also be decided on, whether, for example, coverage should be for rainfall variation, pests or theft. Finally, the value of the claims to be settled must be assessed if the insured event occurs. These are all questions that perplex the insurance industry but they must not prevent the industry from moving forward.

Chief Guest, **Chairman, National Insurance Trust Fund (NITF) Sri Lanka Manjula de Silva** said the workshop meets a long-felt need for a common platform that brings stakeholders together to discuss the importance of agricultural insurance. Certain other organizations, including the ADB and Sanasa Insurance, have carried out work in the area of agricultural insurance, several of whom are present at this workshop.

Although agricultural insurance has not as yet been established in Sri Lanka, there are schemes that provide compensation to farmers, although these may need to be streamlined and improved. Rs. 1.8 billion was paid out in insurance claims for losses sustained in the Maha season in 2016 and the Maha and Yala seasons in 2017. The revenue for these compensation payments comes from a crop levy collected by the NITF from all financial institutions - banks, insurance companies and finance companies. These institutions contribute 1% of their profit after tax paid quarterly and adjusted annually, which amounts to a total of approximately Rs. 1.8 billion and has been reinsured as additional protection. The NITF works in partnership with the Agriculture Insurance Board, who assess claims and make payments.

This compensation was earlier restricted to paddy farmers but has now been extended to cover onions, potatoes, chilly, maize and soybean crops. Compensation is limited to Rs 10,000 per acre but the Agrarian Insurance Board is planning to increase this sum to Rs. 40,000 per acre with the first slab of Rs. 10,000 contributed by the financial institutions and the balance contributed in part through a premium paid partly by the beneficiaries and partly subsidized by the Treasury.

There are gaps however. The loss sustained by paddy farmers exceeded Rs. 7 billion so the Treasury had to meet the shortfall. Tea smallholders and producers of other agricultural crops are not covered. NITF is looking at ways to bridge these gaps, on behalf of the government.

In his closing remarks, **Head, Sri Lanka Development Initiative, IWMI, Herath Manthrithilake** emphasized the need to change the rural mindset if insurance solutions are to be effective. Rural farmers are more accustomed to being provided with state benefits like grants and subsidies and could resist software solutions like insurance designed to promote social resilience and build capacities. So the onus is on insurance companies to promote the concept of self-resilience and the importance of working towards one's own independence.

This is a key task faced by the industry and is essential to building a better society. All communication should be evidence-based, which is where research comes in. By showing the people information like remote sensing data they could be made to understand and convinced of the importance of building long-term social reliance over short- term political gains.

It is also necessary to explore how a model from other countries could be introduced in Sri Lanka, given the rural mindset and utilizing the institutional framework available.

Although there is opportunity and money available in this area, he cautioned that the steps taken must be careful and consistent. There is much to be done but working in partnership will overcome the challenges.

SESSION 2

Technical session

1. Index insurance as an instrument for managing risk and building resilience: examples of Flood Insurance and Crop Advisory Services: Giriraj Amarnath, IWMI

Natural catastrophic risk is growing as a result of unplanned urbanization, persistent poverty and ecosystem degradation. A recent report by reinsurer Munich Re estimates that the insurance industry suffered losses of US\$135 billion worldwide the previous year, 2017, the highest in about 40 years. Global economic losses from natural disasters was reported to be US\$330 billion during the year, 97% was due to extreme weather patterns. The data from EM DAT indicates that floods were the highest occurring natural disasters in Sri Lanka, a total of 33 major floods occurred between 2000 and 2017 and accounted for the main share of damages, estimated at economic losses exceeding US\$ 2 billion.

Weather-related hazards are on the increase and if they are not managed over time they will affect people and governments in terms of fatalities and physical damage that makes recovery difficult. But the risks must be managed in ways that support adaptation of the most vulnerable sectors.

IWMI promotes remote sensing-based flood mapping, flood hazard and vulnerability assessment to monitor and help manage extreme weather conditions. This data is used in emergency response planning to generate emergency maps, in partnership with the DMC. The maps have also been shared in real-time with the Emergency Operations Centre (EOC). The data is now part of IWMI's online system that strives to provide near-real-time information.

Today, risk management has progressed to the transfer risk in building resilience and reduce economic losses. Risk transfer facilitates increase the level of risk, strengthens the coping mechanisms of communities and mitigates risk exposures. Insurers could play a key role in risk transfer part and improving effectiveness through increased investment in this area.

IWMI implemented the Index Based Flood Insurance (IBFI) as a solution for effective risk management and has introduced it in India. The government, insurance companies and other private sector partners provided the resources and knowledge to design a micro insurance product. Climate and weather information on flood depth and duration spanning 35 years was utilized in designing the product. A range of technologies - computer modelling, remote sensing data, data from satellites and station-based water level information were used as well as economic crop loss information provided by insurance companies. The validity of the product was also tested cross-checked with information obtained from farmers and government officials on their experiences in the floods of 2010.

Payouts are based on the number of days of crop inundation which correspond to payouts starting from 35%, the sum insured is paid in full if inundation exceeds 23 days.

The product was introduced in July 2017 as a pilot project to six villages in Bihar, India, which covers 200 farmers. The premium amounted to INR 3,51,578 and the sum insured was 5 million INR. The product is transparent and village-specific, providing a viable alternative to mid-season calamity surveys. Affected farmers have received payouts already, valued in total at INR 4,61,090 in February 2018.

The project has the potential to be linked to the Indian government's Pradhan Mantri Fasal Bima Yojana (PMFBY) and Weather Based Crop Insurance Schemes (WBCIS, which involve a USD 5 million investment. The fact that the product covers only basic risk is a disadvantage.

Technological interventions will continue to play a role in minimizing the gap that could occur between the premium paid and the sum insured released to the community. However, risk identification and pricing should reflect the level of risk if the product is to be effective, and risk reduction measures adopted should include direct financing, either through loans or investment, as is the practice in India when a farmer takes a loan from a government agriculture bank. Invest in resilience in the form of premiums before a disaster happens' is a slogan being promoted in all processes of agricultural insurance from the perspective of disaster risk insurance. The platform for implementation is already in place by way of the SDGs, the semi framework for disaster reduction, and the Paris Climate Change Agreement.

Scientific data collected on the depth and duration of floods could be used for other purposes as well. Farmers who lost their crops could use the information to grow alternative crops in available conditions of humidity. This concept is especially applicable to Sri Lanka, where farmers can compensate for crops lost during the recent yala and maha seasons by growing cash crops in the two months that follow the seasons.

IWMI is exploring further technologies that could be used for risk transfer. Available technologies include emergency maps created from satellite information on the areas of inundation before and after floods. These have been utilized in Sri Lanka to assess the flooding of Kelani river in 2016 and the Southern province in 2017 Sri Lanka. Satellite-based information could be used to create such maps at district level if sufficient risk information was available.

Other sophisticated technology used by IWMI to assess flood damage includes a low flying drone. This provides detailed high- resolution information and images on flood damage. The drone was used to obtain flood information in Hanwella town along the Kelani river from an altitude of 70 meters. IWMI also uses social networks to ensure the information reaches the end user through crowdsourcing technologies.

As a further step to the work in micro insurance, IWMI is developing digital crop insurance solutions with insurance companies in India.

Insurer need information after the crop insurance policy is issued to farmers either through agricultural banks or directly by insurer. They already have access to the limited weather forecast data and crop calendar supplied by the Meteorological Department. Additionally, IWMI supplements this by providing them with more information on weather forecasts and rainfall estimates received from satellite data, high resolution satellite sensors and crop sensors to measure vegetation health. These sources provide them with a summary of forecast weather information that they could share.

The farming data is obtained and digitalized through multiple cloud- based channels . Data from satellites, mobile apps and weather stations is also incorporated through a programming tool and a live database is generated. This provides real time data on crop growth, crop cover and crop production that is used by insurance companies for estimating overall crop losses. This information can be made available to farmers, agronomists and other stakeholders, and enables them to practice guided farming

that reduces risk. The model is flexible and enables use of a variety of parameters. Overall our role is to guide insurer to estimate reliable compensation for the damaged crops quickly and reduce the overall sampling on crop cutting experiment (CCE) being conducted in the field to estimate crop production.

IWMI has also designed a drought monitoring system which enables monitoring of spatio temporal patterns of drought severity over several years. This is also useful in managing water stress. A key innovation in soil moisture information was also introduced, namely, the Soil Water Anomaly Drought Index (SWADI). This model enables the capture of soil moisture stress on a regular basis using satellite data. IWMI has requested Epic Technologies to develop a soil moisture sensor to integrate with this system for use by agricultural insurance companies when determining drought insurance.

The way forward. Dr Giriraj said that more investment in pre-crisis financial management is necessary to meet post-disaster recovery needs. IWMI is exploring ways to design a comprehensive disaster-risk financing strategy that includes Insurance solutions that incentivize communities to manage and reduce risk better.

However, progress must be cautious and solutions should be based on research because there is no one-size-fits-all product suitable for all communities and economies.

Agricultural insurance should be add-on products available within existing crop Insurance and other schemes, improving its outreach and acceptability to farmers will reduce their burden and promote better livelihoods. Plenty of tools and indexes are available which must be used and scaled up to cover important risks and meet the requirements of both farmers and insurers.

Knowledge must be shared and capacities built to provide effective agricultural insurance. A scientific approach that goes beyond merely listening to farmers and governments is vital to design effective agricultural insurance products as are sustainable public-private partnerships and business models.

Questions from presentation

Question: Is the data captured daily?

Answer: Different data is used for different purposes. Rainfall data is captured daily, but during the flood season, rainfall data is captured every 3 hours. Data on drought is captured weekly. During times of disaster, five images are processed daily. The requirements differ, depending on the emergency.

Question: If we give you the GPS coordinates in the Anuradhapura area for instance, could you give us the NDVI and tell us how much the vegetation is on a particular day?

Answer: Yes. This data is available and we are processing it regularly to capture drought stress over South Asia.

Question: How high is the resolution of satellite data?

Answer: the CGIAR has an open data policy system, so we use only freely available satellite information. Here we are talking of 10 meters to 200 meters to 500 meters. In the case of a continental product we go 250 to 500 meters, in the event of a flood we go about 10 meters depending on the resolution. We

don't have any product less than 10 meters. During a disaster however, we go less than 10 meters to 2.5 meters, 50 cm. according to the data from the space agency. On the Sri Lankan scale, 10 meters provides good information.

Question: Have you done any calibrations between the ground level data and the satellite data on flood or drought?

Answer: If we take flood insurance, for example, the daily water level is provided by the Central Water Commission, so we know when the water level is rising. The model has already been calibrated for the last 30 years, it is run using the same data. Our field staff determine if the water level is increasing, which is captured on the model. Field-based information is obtained using the open data kit. This enables the farmer or field staff to take a photograph of rising water levels to which the field staff adds notes. The samples collected are added to the system in real time.

Question: Are you linked with the European Satellite Agency?

Answer: Yes. We have a number of MOUs with the European Space Agency and with countries like Japan, all images are free during disaster.

Question: Do you have any forecasting models?

Answer: Yes, we have a drought early warning and a flood early warning tool, the latter tool inputs European median forecast data to predict the likely areas for flooding ten days in advance.

2. Pilot concept of automatic flood warning and forecasting system to support the insurance industry, CEO, Epic Research & Innovations (Pvt.) Ltd., Shanta Yapa

Loss events have increased between 1980 and 2014, as confirmed by a map on natural disasters designed by German re insurer, Munich Re. This reflects a large protection gap which indicated that about 90% of these areas have not been addressed, which provides insurance companies with opportunities+ to step in. Between 2007 and 2016, uninsured losses as a percentage of economic losses from natural disasters in developing countries was 90% of GDP against the global average of 70% of GDP. In GDP terms, insured and uninsured losses in developing countries between 1977 and 1986 was 0.07% of GDP against the global average of 0.03%. From 2007 to 2016, this increased to 0.17% in developing countries against the global average of 0.8%.

Despite substantial increases in connectivity in Sri Lanka, 200 people died in May 2016 floods, and local insurance companies paid out Rs. 16.5 billion in damages. The May 2017 floods in the following year killed 305 and flood claims mounted to Rs. 4.6 billion.

In response to the floods of 2017, Epic Technologies developed an early warning system within a short time span of two months. This is an innovative device that has the capability of detecting the water level of a river and communicating this information to mobile devices through a remote server.

The device can be assembled for about Rs. 3,000 with components purchased locally. The system features multiple electronic sensors of three types - ultrasonic, pressure and hydrostatic, some of which were developed in-house.

IWMI stepped in as knowledge partner to advise on the characteristics of floods and the parameters to be addressed and developed the forecasting algorithm. Fairfirst Insurance came in as commercial partner and principle sponsor.

Kelani river was selected as a pilot project since this is a commercially important area and most of the victims of the floods during the past two years lived in close proximity to the river. Towers located at strategic positions along the river will transmit information via the Internet to the main server. These towers have computation, communication and forecasting capabilities, and can transmit automatic map updates and GPS data to the server. IWMI provides the expertise to operate the towers. The system utilised Google maps and digital elevation maps. A key feature is the SMS or voice alerts the system can generate that advises insurance field officers to inform their customers located within the possible inundation area, to move to safer locations.

The system could help mitigate flood claims because pre-warning insured customers to be vigilant for a prospective disaster enables them to take the necessary precautions to avoid flood losses. The cost of the system is approximately Rs. 50 million, which amounts to the compensatory cost of two high end vehicles in the event of a flood claim.

Questions

Question: How does this system add value to the system in the Meteorological department?

Answer: Some of the features of this system are not available even in very expensive devices. This is a sophisticated system capable of predicting the level of rainfall if it continues for a particular period of time. The device is cost effective and also ensures last mile accuracy. For instance, if a community of households are given these devices and water is detected, it sends signals to the main server where it is also recorded, which enables cross checking. Households are then alerted to evacuate. At present, despite the fact that people have been alerted to evacuate they have failed to heed the advice, and the government has been blamed for the consequences. The recording facility provides proof of such warnings.

Remark: This system has potential for collaboration with the DMC. Funding will not be an issue if the technology is available. Many organizations and agencies would be interested in funding such initiatives. A comprehensive EW system could be designed at national-level. Public- private collaboration is necessary to implement it.

3. IWMI's low-cost mobile weather station to prevent natural disasters David Wiberg, Head of Hydroinformatics

IWMI developed the model of a low-cost open source mobile weather station several years ago, which could be easily assembled from an open source design available online with components bought from a local electronics shop.

The model was designed to respond to an information gap. IWMI was approached by the Irrigation Department in Sri Lanka to design a tool that provides climate and spatial information on the Malwathu Oya, in the catchment of the Nachchaduwa Tank, which experiences regular monsoonal floods. Manual rainfall gauges available in the area were inadequate to provide advance warning on possible flooding.

Precipitation in Sri Lanka is spatially varied so a larger network that includes the remote areas of the island was necessary to facilitate better and more frequent flood information. Available solutions were expensive and not available in the local market, a fee is levied to access the information generated, and the technology is proprietary.

The open source weather station has several advantages over the expensive stations. It is versatile and can be set up anywhere. It can be programmed according to the user's needs and the technology and information is controlled and fully owned by the user.

It has different types of rain gauges and sensors to monitor changes in the climate and uses an inexpensive micro SD card similar to a mobile phone. Information is stored on a GPRS board that sends text messages or data across networks to servers. This information could be used for modelling purposes as well as for analysis and decision- making, and ensures transparency.

The model is adaptable and can accommodate add- ons with minimal reprogramming of the software. Google Earth fully owns the open source technology.

The total cost of the weather station is about \$ 250 which includes a components cost of about \$ 150 and a setting up cost of \$ 100. The blue print and Information on setting up the hardware and software is available on the IWMI website.

The information provided by the weather station could help insurers improve their indexes by enabling them to make informed decisions that reduce basic risk. The information also educates consumers and helps them take steps to mitigate risk.

Several countries and organizations have expressed interest in the prototype. The weather stations are currently being used in Sri Lanka by the Meteorological Department's laboratory, the weather Coordinating Secretariat for Science, Technology and Education (COSTI) National Weather Laboratory. IWMI works with the Lanka Rainwater Harvesting Forum to establish the early warning systems in Sri Lankan schools as educational tools. IWMI also inspired young Sri Lankan entrepreneurs to develop a startup model at their organization, A&T Labs, who are providing based on the prototype.

The stations have been developed further by the University of Moratuwa and Institute of Earth Sciences, Switzerland, to create a weather observatory. Other countries and projects that have already utilized the model include the Pakistan Meteorological Department and the World Food Programme and UNESCO.

Questions

Remarks: The DMC working with the Meteorological Department could partner IWMI in developing this initiative further.

SESSION 3 : PANEL DISCUSSION {Theme: The Effectiveness of Index-based Insurance as a Tool to Manage Weather Risks and building knowledge network in Sri Lanka}

Panelists: Sydney Gajanayake, [Agricultural and Agrarian Insurance Board], S. Premalal [DoM], Kanchana Wickramasinghe [IPS], Shanta Yapa [Epic Lanka], Giriraj Amarnath [IWMI]

Moderator: Sanath De Silva, CEO, NITF

All panelists expressed the importance of a workshop of this nature and the key role it plays in bringing leading stakeholders together for collaborative learning from the initiatives and experiences of each other. These learnings could form the basis of a cooperative framework for establishing agricultural insurance in Sri Lanka.

Moderator Sanath De Silva introduced the topic by giving a brief overview of the current status of agricultural insurance in Sri Lanka.

He commented that the NITF and the Agricultural and Agrarian Insurance Board provided insurance for paddy cultivation and paddy loan protection and some schemes were offered by Sanasa Insurance as well. However, few commercial insurance companies offered agricultural insurance products. Most commercial insurance companies were reluctant to venture into agricultural insurance because of the risk to their profit margins: a single disaster could divest them of their funds and reserves. This situation must be addressed.

Question: The moderator requested panelist Sydney Gajanayake to outline the current status of weather index and crop insurance in Sri Lanka and the gaps and challenges faced.

Answer: Mr Gajanayake stated that private insurers were not involved in agricultural insurance because the actuarial pricing is about 8% to 9% of the total risk, and the farming communities cannot afford to pay high premiums because of their low incomes. However, the government implemented some protection programs between 2013 and 2015 for the paddy sector which have now been extended to cover five more essential crops. The farmer pays a low premium and the program is subsidized by the government.

Weather index insurance is still at the testing stage. It was begun in 2016 and five projects have been completed in Vavuniya to date. Mr Gajanayake opined that index insurance is not equipped to handle agricultural insurance on its own. A hybrid system was necessary because the country's singular microclimate has prompted heavy use of weather stations throughout the island.

Question. The moderator asked of Mr Premalal how he sees the scope of implementing satellite technology and early warning systems for restructuring solutions, from the perspective of the DMC, given the fact that the country needs to address the challenge of recurrent floods.

Answer: Mr Premalal responded that he sees good potential in the technology because existing mechanisms must be used to address these issues. But the DMC prioritizes improving resilience through reducing disaster risk, and that risk transfer comes secondary. Changing rural mindsets to accept contributory insurance, as mentioned by Dr Manthrithilaka earlier, is a viable and long-term approach. DMC could work with IWMI in the lead to improve predictions on floods and droughts.

Question: The moderator asked Mr Premalal how best the DMC could function as a central center of information for the insurance industry to evaluate agricultural risk and minimize the cost of reinsurance in the future.

Answer. Mr Premalal stated that the role of the DMC is essentially one of coordination. The Center is also equipped to speedily disseminate information to the ground level and has a fully- fledged emergency operations center for dissemination of risk-related information. He suggested that institutions should collaborate to address this by employing the DMC's mechanisms.

Mr Gajanayake interposed that the flood index could be utilized to address agricultural insurance. Currently, the GP coordinates of lands are being taken and the Agricultural and Agrarian Insurance Board is in the process of developing the software. In the event of a flood, the GPS coordinates of the farmlands would be used to generate flood coordinates that identify the farmers affected. In a few hours, the Board's in-built system enables transfer of the monies to their bank accounts. Some of the technology of the flood index is being used presently to enable speedy payments to farmers, whereas they are usually required to wait about 3 months to receive compensation under other systems.

The problem issue is with the inadequacy of the drought index because weather indications like humidity must be known, the rainfall index alone cannot help farmers.

Mr Premalal stated that the DMC had, over the past decade, been trying to improve vertical coordination from central to local level, but is now maximizing on horizontal coordination to improve provincial to local interactions to address the issue of resilience. This will be worked on in the future as well.

Question: The moderator commented on the necessity of bringing in technology to assess the extent of damages to agricultural lands for purposes of indemnity. He asked Mr Yapa what technological solutions affordable to the people could be utilized for the purpose.

Mr Yapa identified weather stations as being one technological solution because of their cost-effectiveness. Other cost-effective technologies are also available but the technology not being used to solve social problems and is either under-utilized or being used for the wrong purpose. Forums like these must be developed and partner organizations should work together towards implementation.

Answer: Mr Gajanayake elaborated on the moderator's question. He said that that technology had been introduced in several risk-based initiatives in the island. The Department of Agriculture and the Ministry of Agriculture are in the process of digitalizing agriculture and are working with European satellite agencies for this purpose. Several models have been developed and portable devices that capture and speedily transmit images as well as drones will soon be introduced. The project is almost half-way through. The government, in its current budget has also allocated Rs 3,000 million to the Ministry to develop flood index based insurance to protect the farmer.

Farmers are the source of the country's food, so they must be protected at all costs and claims payments made fast. Rs. 5.10 billion was paid speedily to 510 farmers affected by the drought during the Maha season in 2017, although the total claim of Rs. 20 billion could not be met since the Treasury did not have the capacity to finance this amount.

Question: The moderator asked Ms Kanchana Wickramasinghe how access to finance for stakeholders should be facilitated policy-wise to transfer risk to index-based or indemnity-based solutions.

Answer: Ms Kanchana Wickramasinghe said a recent study confirmed that the major risk management strategy of farmers was borrowings, and that the main risks they face were extreme weather events, rainfall uncertainty and fluctuations in the water levels of small tanks. Some of the key issues in the system arise from the fact that the needs of the farmers have not been adequately addressed. Initiatives like Index based insurance and indemnity based insurance must not be addressed as standalone strategies but should be integrated into other risk management strategies adopted by the farmers. For example, index based insurance could be used effectively alongside agriculture credit, a suggestion put forward by the farmers themselves.

Question: Sanath De Silva enquired of Ms Wickramasinghe if she had suggestions as to how farmers could be moved from the informal to the formal sector. He said the NITF had launched the paddy farmers loan protection scheme that provides them with full protection to pay off the crop levy, with this progression in mind. But financial institutions were reluctant to grant them loans despite the fact of the full protection provided by the NITF loan scheme.

Answer: Mr Yapa responded to this question, citing the experience of his company in developing solutions to extend the reach of banks to a non banking clientele. He said several effective solutions had been developed that had reduced documentation and did not necessitate direct access to banks.

Moderator Sanath de Silva observed that such modern high- tech banking has not as yet permeated to grassroots level. He suggested that a policy decision should be taken to introduce a project that integrated the farmers into the formal banking sector and made credit facilities more accessible. This will reduce their social vulnerabilities that stem from non formal sector borrowings.

Mr Gajanayake demurred that awareness on loan protection is now being created and that the situation is being addressed. Farmers could now provide banks with their insurance policy document as security, but the Central Bank needs to provide the instruction.

Despite the fact that mobile penetration has exceeded 100%, banking penetration in the island is still below 40%. There is potential for using technology to increase banking activities but collaboration with stakeholders is necessary to take this forward.

Question: The moderator asked Dr Giriraj about the extent of the technical capacity that insurers have for executing index based insurance in the future and disseminating know-how, and how reliable the grid data is, since technical knowhow is material to the insurance industry from the perspective of agriculture.

Answer: Dr Giriraj traced the evolution of a well- known weather insurance scheme in India to illustrate his argument. Weather index insurance was first started in India in 1995 with ICICI in collaboration with the World Bank as a pilot project in Andhra Pradesh. The product faced many challenges and did not work at the time in terms of sustainability and scaling up due to local weather conditions, data quality and declining weather stations. Insurance companies in India did not accept the data because it had not been provided by the government. The product was not accepted by the farmers either because they received no payouts during that time. But today, the scheme's user base has reached 40 million farmers. Index and indemnity insurance have been merged and the project has expanded considerably. It is now

known throughout India as the Prime minister's crop insurance scheme. An extensive network of state agencies and a massive number of weather stations generate high volumes of data at low fees. The government subsidizes the farmers and are planning to invest over \$ 5 billion in the scheme.

The data available has also expanded to include automatic weather stations and crop cutting experiments that ensure farmers know their crop yield in advance, which promotes transparency and builds trust.

He said there must be a clear policy when initiating index based insurance and that data should be made available long term (at least 30 years) to promote the insurers' commitment and investment in resources. The main failure of products could be attributed to a lack of trust among partners, but trust is now increasing. However, all partners should be brought together to make them understand the product and grassroots level requirement should be understood prior to implementation.

There is no third party validation since most of the data is freely available in the public domain. This is where satellite data can play a role.

The technology is available but educating farmers on the product must be the first priority to ensure its acceptability and success.

Mr Gajanayake commented that the total value of the six essential crops covered by the Agrarian and Agriculture Board is Rs. 160 billion, so agriculture insurance is the way of the future for insurance companies. But the private sector is not coming in because of the lack of infrastructure. They should involve themselves and support the building of infrastructure.

Mr Premalal added that Sri Lanka should follow the example of India by involving all three tiers of government – central, local and provincial - to assist the farmer. The development and welfare of the people should be the responsibility of the local government, which takes the burden off the central government.

Question: The moderator asked Dr Giriraj how index insurance could be adopted at low cost in Sri Lanka, given the fact that the island has a lesser number of continuous acreage, different terrain and smaller plots of paddy cultivation when compared with countries like India. In low terrain, for example, farmlands could be completely inundated and the farmer severely affected, which would necessitate a combination of index based and indemnity insurance.

Answer: Dr Giriraj said that In cases of heterogeneous terrain, the product developed will need to be very complex because every farmer has the right to grow whatever he wants. Since no loss information for each paddy field is available, the transaction cost will be high if approached from the perspective of the farmer.

Giriraj suggested that in such situations, index insurance should be implemented in a pooling mechanism that considers aggregating farmers. Climate information services could be offered as a bundle product with index based insurance, which would indirectly mitigate risk.

Question: The moderator asked Dr Giriraj about his opinion on crop hedging as a funding mechanism for safeguarding farmers.

Dr Manthrithilaka responded to the question from the audience. He said that although it was a good suggestion, the practicality of implementation is low unless private sector support is obtained. Farmers do not have the income necessary to implement this system, a bumper harvest would bring in between Rs. 40,000 and Rs. 60,000. As a result, many farmers even in high irrigation areas, are moving away from paddy cultivation to crops that give them a steadier cash flow and lower risk.

Moderator Sanath De Silva posed the final question to the entire panel. He requested them to suggest the steps that could be taken to ensure the long- term sustainability of the paddy sector, since paddy is the main crop cultivated in Sri Lanka. The fact that the majority of farmers pursue this livelihood is a clear indication of its profitability.

Mr Premalal affirmed that there is substantial risk in paddy cultivation that must be identified in order to mitigate the impact of a future disaster to the country. The governance component must be addressed and methods of financing must be determined. However, a small number of agencies cannot address this risk. There must be a mechanism to bring together all institutions, including the private sector, to address this issue. The mechanism is in place but it is not being practiced. The Disaster Management Council is the agency responsible for implementation but it is not functioning at present. The Council is headed by the President of Sri Lanka, co-chaired by the Prime minister and the cabinet of ministers are stakeholders. This initiative must be pursued.

Santa Yapa opined that farmer migration to other fields was a problem and that land extent is not the real issue. He advocated technological innovations as being the means to ensuring the nations' prosperity and quoted the experience of the US. The US reduced its dependency on agriculture from 85% to 3% with increased technology and now leads the world economy.

Kanchana Wickramasinghe commented that the government must do more to ensure that outputs like technology, research and climate information reach the farmers. There are issues in agriculture extension services and large gaps in dissemination. Discussions with farmers reveal that they are unaware of the research on droughts and floods carried out by key institutions. The IPS is doing a study with a research consortium to improve this gap by carrying out a pilot project that provides localised forecasts for farmers. This is integrated with their traditional climate forecasts. In terms of the profit from paddy farming, information from the Department of Census and Statistics states that agriculture is not the island's main source of income and has been declining over the year. Even in the agriculture sector, the main income is from cash crops. Paddy cultivation is practiced mainly because it is the traditional occupation of farmers in the country and rice is necessary for household consumption.

Moderator Sanath De Silva mentioned the importance of an integrated approach to increase the net yield per acre and elevate paddy cultivation to a commercial operation that improved livelihoods.

In his summing up of the panel discussion, the moderator said the panelists had raised several good points and discussed many important issues. One of the areas of focus was the value of new technology for improving rural livelihoods. The importance of a national policy to facilitate risk financing solutions and new agricultural technologies like index based and indemnity based insurance was also pointed out. The need to involve the farmer community to ensure sustainability of the agriculture industry was another area highlighted. Finally, the panelists emphasized the importance of an integrated approach that involves all participating institutions for ensuring the development and sustainability of the agricultural insurance sector into the future.

The forum was opened to receive questions from the audience.

Mangala Herath of Sanasa Insurance enquired if there were any strategies to overcome the basic risk component of index based insurance. He also asked Mr Gajanayake about the claims ratio experienced by the Agricultural and Agriculture Insurance Board.

Sydney Gajanayake stated that he was unable to provide a definite loss ratio because the insurance premium obtained by the Board is subsidized by the government, but estimated that the ratio would be about 9% or 10%, which is a positive one. He said there was a definite pattern between the claims and the weather especially from 2013 onwards.

Dr Giriraj responded that when assessing basic risk, the type of risk must be determined. The exposure information available and the farmers' support of premium payments must be also assessed because farmers are heavily subsidized in most countries. In situations of high subsidies, the government will be unable to go beyond paying high premium rates. However, if a good premium is provided by the government or the farmers a comprehensive risk solution could be determined based on the actual loss to be paid. That point has not been reached even in developed countries like the US. The premium of farmers even in the US is subsidized by 80%. So the basic risk is beyond at this stage is beyond expectations. But there are ways in which the basic risk could be transferred provided there is credible data, a credible product, the cooperation of the farmers and the government as well as a good market.

Sanath De Silva commented that the challenge in the agriculture sector is that intermediaries make money while the end user pays a higher price than necessary and the farmer gets a lower price for his produce. The agriculture sector must be de-politicized if it is to move forward. This could be accomplished slowly and surely.

Closing remarks

Dr Giriraj wrapped up the workshop by thanking Sanath De Silva for leading the panel discussion, and for the participants for their time and inputs. He stated that the sessions had generated valuable information and despite time constraints, were successful in determining the way forward. The sessions must be also continued in a forum and ways to attract more information must be looked into by prioritizing a few key areas. The network of stakeholders must be expanded to include more private sector and insurance companies who will be accessed on a single platform. Finally, IWMI will explore new initiatives in Sri Lanka in collaboration with government agencies, insurance industry to scale up the ongoing efforts by CGIAR's index insurance for smallholder farmers.

Participant list

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