KP24

Knowledge Product 24

CCARDESA

Centre for Coordination of Agricultural Research and Development for Southern Africa

POLICY BRIEF:

Index-based insurance: How does it work and is it climate smart?

CLIMATE SMART AGRICULTURE
KNOWLEDGE PRODUCTS FOR EXTENSION WORKERS
Customised Information Tool for Agricultural Professionals

Audience: Directors of Research, Directors of Extension, Heads of NARES, Farmers Organisations and National Level Extension Staff, Social Protection Agencies and Ministries

Policy Brief | Climate Smart | Technology | Gender | Youth

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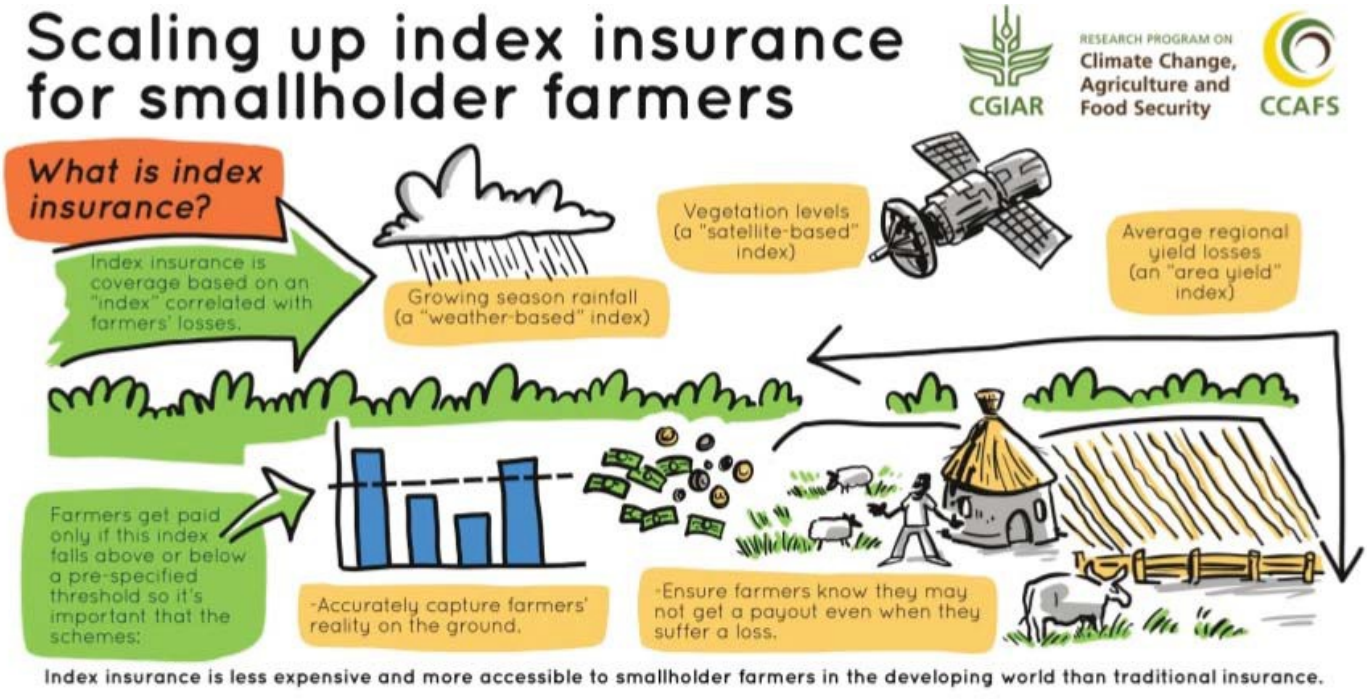
WHAT IS INDEX-BASED INSURANCE AND HOW DOES IT WORK?

Index-based insurance (IBI) compensates farmers in the event of a loss (Greatrex et al. 2015). IBI generally uses '**proxy**' indices relating to specific risks (often climate related) that may affect a farmer's yield. Proxy indicators typically include rainfall or extreme temperatures. For example, the amount of rain received within a certain window is linked to a percentage yield decline for farmers in a specific area. Should the amount of rain fall below or exceed the established thresholds, a payout is triggered to compensate farmers for anticipated loss. This approach can also introduce efficiencies for the insurance company, as they do not need to visit the farmer's fields to assess potential losses.

Key Messages:

1. An **index-based insurance** (IBI) policy represents a viable risk-transfer option for smallholder farmers in the SADC region
2. IBI is Climate Smart, as it sustainably increases productivity, improves resilience, and can encourage practices that reduce Greenhouse Gas (GHG) emissions
3. There are multiple examples of successful implementation of IBI across Africa
4. IBI requires substantial investment in the enabling environment to be implemented at scale.

Figure 1: The principles of index-based insurance.



Source: CCAFS2018

Table 1 provides a comparison between IBI and indemnity traditional insurance, which directly covers crop yield losses.

Table 1: Differences between index-based and crop indemnity insurance.

Index-based insurance	Crop indemnity insurance
Based on proxy index against well-defined climate risk	Based on direct losses
Specific indicators and thresholds for key risks (cheaper premiums)	Could cover a variety of causes/risks – more expensive premiums
Clear incentive to use climate smart farming practices to keep crops alive in a poor year, as payout will be issued directly based on weather indices – regardless of crop failure or reduced yields	No real incentive to keep crops alive, as payout is dependent on yields failing – moral hazard
Might not cover losses as a result of unforeseen causes	Covers majority of yield losses
Requires monitoring data (ground weather monitoring data, remote sensing) payout generally collected remotely	Requires field-level assessments
Can cater for a larger geographic area by monitoring established weather indices in that area	Can be logistically challenging, as assessor required to verify loss
Potential for using distribution systems (e.g., Mobile Money) for payouts and subscriptions (no need to assess losses directly)	

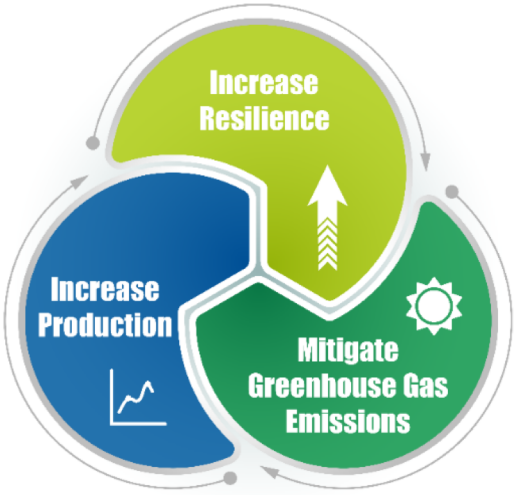
IS INDEX-BASED INSURANCE CLIMATE SMART?

Climate smart agriculture (CSA) is an approach to reorient agricultural systems to effectively and sustainably support food security[1]. CSA includes actions at various scales from farm plots, farming systems and landscapes, to national and global contexts.

This approach aims, within the context of national food security and development goals, to tackle three main objectives (FAO, 2013):

1. Sustainably improve food security by increasing agricultural productivity and incomes
2. Build resilience and adaption to climate change
3. Develop opportunities to reduce greenhouse gas emissions – compared to expected trends, where possible.

Figure 2: Pillars of CSA.



[1] 'Agriculture' is taken to include crop and livestock production, as well as fisheries and forest management.

Figure 3 below indicates how each one of the pillars of CSA is addressed by index-based insurance.

Figure 3: Climate smart pillars and index-based insurance.

INCREASE PRODUCTION	ADAPTATION/ RESILIENCE	MITIGATE GHG EMISSIONS
Increased access to credit for intensification/improvement of inputs and procedures Farmers protected against major climate-related shocks can afford to take additional risks to increase productivity (such as investment in improved practices and expansion of cultivated area)	Protection against losses from specific climate-related shocks – rainfall quantity and duration is particularly relevant to the SADC region Less dependence on community level safety nets Broader agricultural economy advantages (agribusiness and input producers benefit from lower risk and shocks)	Improved practices and intensification leading to improved efficiency of production have been shown to potentially enhance carbon sequestration or reduce GHG emissions. (Campbell et al. 2014)

Sources: Greatrex et al 2015, Adegoke et al 2017, Campbell et al. 2014

Examples of successful index-based insurance

In recent years, IBI has been implemented in many different countries across the continent. Project design has varied between locations, depending on the following factors:

- The country context
- Farmer requirements
- Available resources
- Institutional capacity
- The regulatory environment.

A few examples of prominent IBI schemes in Africa are summarised in Table 2.

Table 2: Examples of index-based insurance schemes in Africa.

ACRE (Agriculture and Climate Risk Enterprise)
Countries: Kenya, Rwanda, Tanzania
Start Date: 2009

Farmer Crops: Maize, beans, wheat, sorghum, coffee, potatoes

Data Sources: Remote sensing and climate stations

Key Elements: One of the largest and fastest growing micro-insurance schemes in Africa

Strong links to aggregators and mobile technology. Wide range of products, mostly linked to credit or inputs

Partners include local and international finance and insurance institutions

Mobile Money is a key component of the process, both in premium collection and payouts. Replanting Guarantee Product covering vulnerable planting period.

R4 Rural Resilience Initiative
Countries: Malawi, Zambia, Zimbabwe, Kenya, Ethiopia, Senegal
Start Date: 2011

Farmer Crops: Teff, beans, maize, wheat, barley, sorghum, millet, cassava

Data Sources: Several data sources used, including remote sensing (Alaska Research CubeSat 2 (ARC2) satellite rainfall estimates)

Key Elements: IBI as a component of a diverse risk management strategy with a strong participatory approach

The project has directly engaged organizations at all stages of the insurance process, including farmer groups, governments, banks, microfinance institutions, local insurers, research institutions and international reinsurers

A farmer-led, integrated risk management project, with labour for insurance (participation in work programmes building community resilience for subsidised insurance premiums) and satellite rainfall indices.

Index-based livestock insurance (IBLI)
Country: Kenya
Start Date: 2006

Farmer Crops: Livestock (camels, cattle, sheep, goats and horses)

Data Sources: Uses satellite-based vegetation index over the target area

Key Elements: Innovative approach towards pastoralists who can be nomadic

A public–private partnership with innovative risk layering within a diversified risk management portfolio.

Assurance Récolte Sahel (ARS)
Countries: Mali, Burkina Faso, Benin, Senegal, Ivory Coast
Start Date: 2011

Farmer Crops: Various crops

Data Source: Weather stations, remote sensing, relative evapotranspiration, rainfall estimates

Key Elements: Incorporates access to credit

Four indices used for different products and crops.

Sources: Greatrex et al 2015, Adegoke et al 2017, IBLI 2018, WFP 2018, Mude et al. 2010

The ACRE project is often referenced when demonstrating the viability of IBIs in Africa. It forms the largest agricultural insurance programme in sub-Saharan Africa (Greatrex et al. 2015). Unlike other projects, some of the premiums paid by farmers in the ACRE project **have not been** subsidised. This demonstrates the financial viability of IBI as a concept.

The project uses several data sources for indices, from automatic weather stations to remote sensing, and features a wide range of products (Nganga. 2013). The project also plays an important **intermediary role** between insurance companies, reinsurers and distribution channels for ACRE as an organisation – see Figure 4. This helped to drive the initiative and coordinate stakeholders.

Mobile Money plays a key role in the success of the project, allowing for quick subscription and payment of claims – without having to visit farmers or farmers having to leave their fields.

IBI PRODUCT SHOWCASE:

ACRE REPLANTING GUARANTEE

- This product incorporated an insurance premium into the price of a bag of seed
- The bag of seed contains a scratch card with a code to be texted to ACRE during the planting period to start coverage against drought
- The farms are monitored using remote sensing for 21 days after receiving the text
- If the index was triggered, the farmer would automatically receive a payment via mobile money for a new bag of seed in order to replant.

Figure 4: ACRE Africa Business Model.

Source: Acre Africa 2018.

THE ENABLING ENVIRONMENT

The **enabling environment** for CSA is the set of **conditions that facilitate and support the widespread adoption of climate-smart technologies and practices.** This includes policies, institutional arrangements, stakeholder involvement, gender considerations, infrastructure and insurance schemes, as well as access to weather information and advisory services.

The enabling environment should provide the **laws, regulations** and **incentives** to assure that **reorientation** and **transformation** towards climate smart agriculture proceeds effectively and sustainably. Many index insurance schemes (micro, meso and macro) rely on public support to facilitate greater involvement of private insurers, and to enhance farmer uptake with varying state (and donor) involvement in the provision of an enabling regulatory environment. The aim should be to build institutional capacity at all levels, and to reduce risks deterring farmers from investing in innovative technologies and practices. Policy makers need to take note of the listed challenges that follow, and to ensure that plans to implement IBI address these challenges in a way that is relevant to national contexts.

Experience has shown that investing in the enabling environment is essential for implementing CSA at larger scales. The following factors need to be in place for IBI to be rolled out appropriately:

- Data availability
- Institutional capacity
- Farmer capacity
- Regulatory environment
- Subsidisation
- Addressing basis risk.

Data availability

Foremost among the challenges facing IBI is the **limited availability of ground-based weather data.** Accurate and reliable weather data is required for actuarial calculations and creation of indices (Parthasarathy 2014) by insurance providers. In many countries, the information available is not accurate enough, or does not capture enough variables (Adegoke et al. 2017). The most accurate and reliable indices use a combination of ground (data collected using weather stations/ gauges, etc.) and remote sensing data (data collected by satellite/aircraft) to measure climate thresholds. Investing in reliable climate and weather monitoring with a high density of ground-based weather data gathering is essential in the development of IBI at scale (Hess & Hazell 2016).

Ashton, 2009

Institutional capacity

The implementation of IBI requires input from multiple actors. These include NGOs, agricultural extension services, insurance companies, reinsurers, financial institutions, microfinance companies, agribusinesses, meteorological services and mobile networks. The successful implementation of IBI relies on the cross-sectoral coordination and cooperation of these role players. This is critical to overcoming barriers in bringing IBI to smallholder farmers in a meaningful way (Adegoke et al. 2017).

IBI also requires insurance firms with the desire and capacity to sell insurance schemes in rural areas with low penetration. In a traditionally urban and peri-urban sector, this may prove to be a challenge (Greatrex et al. 2015). Providing services in languages understood by most local people is essential.

Many of the successful examples of IBIs noted in Table 2 have bundled access to credit together with IBI schemes. This provides a clear incentive for enrolment to the farmer and can result in increased productivity (Jensen & Barrett. 2017).

Farmer capacity

Farmers at a subsistence level need to have the capacity to understand the concept of IBI and be able to navigate the required financial and recording systems. In many parts of the SADC region, this may be a barrier to implementation. Trust needs to be built between farmers and insurance providers before meaningful scale up can be achieved (Hess & Hazell. 2016). **Women** and **Youth** farmers may need to be specifically targeted for capacity building in order to take advantage of IBI.

If mobile technology is being utilised in the implementation of IBI, it is important to understand the different challenges faced by men, women and youth in accessing this technology. The use of mobile phones and the internet often faces the problems associated with illiteracy, and the ability of the target audience to use the technology. Women generally have lower levels of literacy than men and often have more limited access to technology or services, even though they are frequently able to make better use of the information provided than men can.

Regulatory environment

The relevant legislation and regulatory bodies need to be in place in order to implement IBI. This is similar to conventional insurance, in that customer protection requires a **strong regulatory framework**. This includes regulations such as minimum capital to liability holdings requirements, clear index certification processes, and efficient dispute resolution mechanisms. Under some legislation, index-based contracts are not enforceable or may even be illegal, leading to a high level of regulatory risk for insurers and reinsurers (Jensen & Barrett 2017).

Subsidisation

Almost all of the examples of successfully implemented IBI programmes involve a level of subsidisation, particularly during the project launch period. The required investment in building capacities, systems, indices and data monitoring capabilities can be substantial. It is often subsidised by donor organisations or public funds. This extends to the premiums, which may need to be subsidised in order to promote farmer buy-in and inspire trust in the system (Jensen & Barrett. 2017).

Address basis risk

Basis risk is the **difference between a payout and the farmer's actual loss.** Basis risk can result from any number of factors from poor correlation to indices, to other stressors causing crop losses (not directly climate related). In order to be successful, an index must be designed so that the farmer is secured against the targeted risk, and accurately replaces losses. Accurately calculating basic risk has been shown to be a key challenge in designing IBIs in a way that ensures farmers' continued trust in payouts (Hess & Hazell. 2016).

TO SUMMARISE

Index-based insurance (IBI) is one of a set of important climate change adaptation mechanisms available to smallholder farmers. It has been shown to be **climate smart**, and to be a viable option for risk reduction for farmers in the SADC region. There is a growing body of evidence and examples across sub-Saharan Africa demonstrating the viability of the concept, and highlighting challenges that need to be overcome to implement at scale.

Chief among these are:

- Data availability requirements
- Capacities at institutional and farmer level
  - Including gender disparities in access to and use of technologies/services
- The regulatory environment.

Implementers and policy makers need to understand these challenges, and plan to address them in ways that are appropriate to the local contexts in which they operate.

WHERE CAN I FIND MORE INFORMATION?

- **CCARDESA Knowledge Hub** – See various Decision Support Tools for reference to ICT specific to CSA practices and technologies www.ccardesa.org

- **The Global Index Insurance Facility (GIIF)** – The Global Index Insurance Facility (GIIF) is a dedicated World Bank Group's programme that facilitates access to finance for smallholder farmers, micro-entrepreneurs, and microfinance institutions through the provisions of catastrophic risk transfer solutions and index-based insurance in developing countries https://www.indexinsuranceforum.org

- **Impact Insurance (ILO)** – The ILO's Impact Insurance Facility is enabling the insurance sector, governments, and their partners to embrace impact insurance to reduce households' vulnerability, promote stronger enterprises and facilitate better public policies

  http://www.impactinsurance.org

- **The Global Action Network (GAN)** on agriculture insurance – a consortium of thought leaders from the development, private sector and research communities who are engaged in developing agriculture insurance markets, working in select countries to build local capacity to implement agriculture insurance http://www.impactinsurance.org/partner/gan

- **FAO (2013)** – Climate-Smart Agriculture Sourcebook. Rome.

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