

# State of Index-Based Crop Insurance Interventions for Smallholder Farmers and Agribusinesses in East Africa

Joab Osumba | John Recha | Teferi Demissie

Status Report



**AICCRA**  
Accelerating Impacts of CGIAR  
Climate Research for Africa



# **State of Index-Based Crop Insurance Interventions for Smallholder Farmers and Agribusinesses in East Africa**

## **Status Report**

**Accelerating Impacts of CGIAR Climate Research for Africa  
(AICCRA)**

**June 2023**

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Titles in this series aim to disseminate interim climate change, agriculture, and food security research and practices and stimulate feedback from the scientific community.

## **About AICCRA**

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## 1. Introduction

This review of index-based agricultural insurance for the Climate Resilient Agribusiness for Tomorrow—CRAFT (<https://crafteastafrica.org/>) project was part of a wider effort to strengthen understanding in the enabling environment for scaling in CRAFT interventions. The findings can be used to design an appropriate agricultural insurance intervention in future.

Climate-smart crop insurance is one of the interventions that was proposed in the project. Smallholder farmers and agribusinesses (SMEs and cooperatives) often lack access to financial services such as insurance, which could help them to prepare, invest, safeguard, and adapt. Opportunities for tailored index-based insurances to cover climate-related crop losses are still underdeveloped in eastern Africa. Further, there is a possibility of the risk or likelihood or prospect of climate change to raise insurance prices. Hence the urgent need to help climate-proof the CRAFT project value chains through financial services such as insurance. In the wider CRAFT enabling environment, there were opportunities for access to insurance services that were either not yet developed (such as tailored index-based insurances to cover for climate-related crop losses) or did not experience sufficient incentives due to high risks and uncertainties, including those related to climate change. East African governments need support in facilitating access to these financial services for agribusinesses and entrepreneurial farmers.

It was therefore proposed that the CRAFT project was to contribute to filling the gaps, especially for insurance. The strategy was for the project to work with national governments, government extension services, private sector companies in insurance services amongst others, in line with East African governmental policies (NAPs and NDCs) and with the overarching objective of ensuring food security in the region as part of the Sustainable Development Goals (SDGs). In the project, it was considered that embracing insurance as a component of inclusive business model would enhance access to development enablers such as energy, communications, financing, and facilitate investments in CSA technologies and inputs. The workstream on enabling environment for CSA aimed for the roll-out of climate-informed index-based agricultural insurances building on existing initiatives to stimulate climate-smart investments and financing.

Based on the existing initiatives premise, a detailed scoping and gap analysis was conducted on the potential for roll-out of index-based insurance, including best practices and clear recommendations were made for development and roll-out of index-based insurance for relevant crops in the Kenyan, Ugandan and Tanzanian context under CRAFT\*<sup>1</sup>. The study found that all the three project area countries had formally initiated index-based agricultural insurance scaling programs to help agricultural value chain actors de-risk production and investments. What was envisioned in the project was a strategy development for public-private roll-out of index-based insurance services.

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<sup>1</sup> Osumba and Recha (2019), “Scoping Study Brief - State of Index-Based Crop Insurance Services in East Africa”; Osumba et al., “State of Index-Based Crop Insurance Services in East Africa.”

## 2. Types of Insurance, and Index-Based Insurance Under Climate Change

Agricultural insurance comes either as crop insurance or livestock insurance.

- Crop insurance: Crop insurance covers the insured person against the loss of crop due to natural disasters, such as drought, floods, hail, etc. Crop insurance can be index-based or peril-based.
- Livestock insurance: Livestock insurance covers the insured person against the loss of livestock due to natural disasters, such as diseases, drought, and floods, hail, etc. Livestock insurance can be index-based or peril-based.

### 2.1 Index-Based Crop Insurance

Index-based crop insurance: Index insurance pays the insured based on the observed value of a specified “index” or variable. Index Insurance can be termed Weather Index Insurance (WII) or Index-Based Weather Insurance (IBWI) or Area Yield Index Insurance (AYII) or Index-Based Area Yield Insurance (IBAYI), or a hybrid index of weather and area yield to diversify the insurance product and hence reduce basis risk associated with index insurance products.

#### 2.1.1 Weather Index Insurance (WII) or Index-Based Weather Insurance (IBWI)

WII or IBWI is a seasonal cover per locality or region for loss or damage to growing crops directly caused by deficits or excesses in weather conditions such as rainfall, temperature, sunlight or wind speed. WII/IBWI can cover an index of: -

1. Rainfall (– e.g., Rainfall estimates/ drought/ excessive rainfall index) to predict losses based on a specific weather parameter measured at a particular weather station or for a given satellite grid over a pre-specified period of time
2. Evapotranspiration (rainfall-water balance vs crop water requirements/State of water sources)
3. Standardized Precipitation Index (SPI). SPI is the deviation of current observed rainfall total from a 30-year average. SPI is one of the indices are used to define drought phases
4. Vegetation condition: State of natural vegetation and pasture conditions
  - a. Vegetation Condition Index (VCI). VCI is based on plant health condition, especially the greenness of vegetation (mainly applicable to pastures so far but can also be used on field crops). VCI compares the current state of the vegetation to the state at same period over a five-year period while. VCI is one of the indices used in drought decision-making.
  - b. Normalized Difference Vegetation Index (NDVI). NDVI is a remote sensing-based index that responds to changes in the amount of green biomass and canopy water stress and can be used as a possible predictor for crop yield. NDVI is mostly used in drought assessment, especially when water is the primary factor being monitored
  - c. Standard Vegetation Index (SVI)
5. Temperature (growing degree days – a index of heat energy required for growth and development of plants during a growing season): heat wave/ cold wave/ frost index

## **2.1.2 Area Yield Index Insurance (AYII) or Index-Based Area Yield Insurance (IBAYI)**

AYII/IBAYI is a seasonal cover for crop yield shortfall below the historical average yield (sometimes called the declared yield) in a unit area of insurance (UAI).

## **2.1.3 Hybrid Index Insurance**

A hybrid index Index-based crop insurance is a combined package of both weather index and area yield index insurance in one contract.

## **2.2 Peril-Based Crop Insurance**

In insurance terms a peril is an event, hazard, situation, or incident that can cause loss or damage to property, and that an insurance contract will cover. Peril-based crop insurance can be Multi-Peril Crop Insurance (MPCI) or Named-Peril Crop Insurance (NPCI). MPCI/ NPCI is a farm-specific approach to agricultural insurance for agricultural risks, based on verifiable farm level production losses. Some of the risks covered by MPCI/NPCI are assorted natural calamities such as droughts, windstorms, floods, uncontrollable pests & diseases, extreme/excessive rainfall, damage caused by wildlife, fires, earthquakes or hailstorms, frosts, lightning, explosion, etc. MPCI/NPCI is a seasonal cover against physical loss or damage to crops directly caused by any of the above-listed perils in a specified farm. MPCI contracts are open and cover all risks unless some are specifically excluded. In NPCI the insurer offers to cover all sorts of crops against a specified peril for a specified farm. Both in MPCI and NPCI, the claim payable is determined by a qualified expert who inspects and scientifically quantifies the magnitude of the loss.

## **2.3 Credit Insurance (or Credit Life Insurance)**

Credit life insurance is an insurance cover to cushion the lender by paying off the credit in case the borrower is not able to pay back the loan due to any “stated” reason. Under credit life insurance there is no pay-out or benefit for the beneficiaries of the borrower, but credit insurance can safeguard the family of the borrower from an outstanding financial obligation. It can also be described as:

- An insurance cover where the lender is the sole beneficiary: Credit insurance insures the consumer's obligations against the consumer's death, disability, unemployment, or other events that may affect the consumer's ability to earn an income to service the debt. The insurance may be required by the credit provider as a pre-condition granting credit to the consumer, or;
- An insurance on a loan or credit for a pay-out to cover existing or outstanding debt, provided by a financial institution and can be claimed against should the borrower be permanently disabled, retrenched, or die.

The reasons often stated are death (read LIFE), disability, unemployment, loss, or destruction of property that was used as collateral, or loss/destruction of traded goods and/or services that the payback was pegged on.

A detailed description of these types of insurance used in agriculture is presented in Table 1.



**Table 1: Types of Crop Insurance**

Category of insurance	Type of insurance	Description	Index-based		Peril-based		Remarks
			Features	Benefits	Features	Benefits	
Index-based	Weather Index Insurance (WII or IBWI)	A seasonal cover for loss or damage to growing crops directly caused by deficit or excesses in weather conditions such as temperature, sunlight, wind speed or rainfall	Can only be for a particular crop within a defined area of homogeneous weather patterns. Pay-out based on actual weather measurement at the reference weather station or satellite in relation to effects at any stage of a crop growth cycle	Cover for many farmers at once, assured stability, affordable, easy claim process, improved financial management			-Provides coverage for smallholder farmers without relying on individual farm assessments for claim processing. No individual claims are for compensation are lodged.  -Does not cover a specific farm or parcel of land and does not have to go with a claim and a valuation on the specific insured farm or parcel of land.
	Area Yield Index Insurance (AYII)	A seasonal cover for crop yield shortfall below the historical average yield in a unit area of insurance (UAI)	Can only be for a particular crop within a defined area of homogeneous production. Pay-out is based on a crop cutting exercises results done at the end of the harvesting period	Cover for all kinds of crops, assured stability of many farmers in one locality, affordable, improved financial management.			-Convenient to smallholder farms
Peril-based	Multi-Peril Crop Insurance (MPCI)	A seasonal cover against physical loss or damage to growing crops directly caused by assorted natural calamities such as			In this, we cover all sorts of crops in a single strand of large or small farms. The claim payable is determin	Cover for all kinds of crops irrespective the farm size, cover from any form of loss associated with nature, stability, improved	-Covers a specific farm or parcel of land and has to go with a claim and a valuation on the specific insured farm or parcel of land.  -It is not convenient to

Category of insurance	Type of insurance	Description	Index-based		Peril-based		Remarks
			Features	Benefits	Features	Benefits	
		Drought, Uncontrollable Pests & Diseases, Hailstone Damage, Flooding, Fire, Lightning, Earthquake, Explosion, Frost and Windstorm, Insect damage			ed by a qualified expert who inspects and scientifically quantifies the magnitude of the loss	financial management and comfort in knowing there is a safety net for unexpected loss and associated costs	smallholder farms
	Named-Peril Crop Insurance (NPCI)	In this, offers are made to cover all sorts of crops in small or large farms. The claim payable is determined by a qualified expert who inspects and scientifically quantifies the magnitude of the loss				Cover for all kinds of crops irrespective the farm size, stability	
Credit/life-based	Credit insurance	An insurance cover to cushion the lender from the borrowers' default					The lender is the sole beneficiary. There is no pay-out or benefit for the beneficiaries, but can safeguard the family of the borrower from an outstanding financial obligation

### 3. Barriers to Index Insurance Interventions

The scoping study determined the preliminary status of user demand for climate/weather related information services and for index-based insurance services. The preliminary demand was determined as low, due to several gaps and barriers identified, but detailed studies on the extent of user demand were deferred. CRAFT project business case champions who are the entry points of implementation would need to be more directly engaged in such a review.

A policy engagement workshop held in Kampala in December 2019 for climate information and insurance stakeholders discussed the demand issue with a view to reaching a consensus on the way forward for climate information and index insurance. Informal policy engagement was also initiated with the following stakeholders in 2019:

- Kenya Meteorological Department (KMD) and Kenya Agricultural and Livestock Research Organization (KALRO) Agricultural Observatory Platform (KAOP) in Kenya
- Tanzania Insurance Regulatory Authority (TIRA) and Ministry of Agriculture and Cooperatives (MoAC) in Tanzania for index-based insurance
- Agriculture and Climate Risk Enterprise (ACRE Africa) in Kenya and Tanzania for index-based insurance
- Uganda National Meteorological Authority (UNMA)
- Environmental Analysis and Remote Sensing (EARS)/ eLEAF Competence Centre and Agro-Insurance Consortium (AIC) in Uganda for Agro-Weather Information and index-based insurance
- As well as a number of private sector prospective index-based insurance service providers

In Kenya there was the Kenya Agricultural Insurance Program (KAIP) Crop Insurance Sub-Program (K-CIP), which started in 2015. Uganda Agriculture Insurance Scheme (UAIS), a PPP, started in 2016. The Uganda Agriculture Insurance Scheme (UAIS) is a public-private partnership to provide agricultural insurance to small and large-scale farmers in Uganda. This public-private partnership supports accessibility of index-based insurance for smallholder farmers through government-subsidized premiums. It also leverages industry knowledge on how best to develop products and service premiums and claims and in a cost-effective way. A joint approach between the insurance industry and the supervisor is also being undertaken for consumer awareness of index-based insurance products. Tanzania in 2019 launched its Tanzania Agriculture Insurance Program (an index insurance strategy/guidelines) but the COVID-19 pandemic of 2020 hindered its take-off. Whereas the piloting of scaling activities had started in each country by the time of the start of CRAFT project, the process was hindered by so many gaps and barriers.

## 4. Attempts to Link Agribusiness Partners and Farmers to Collaborative Insurance Initiatives

There were attempts to link CRAFT Project business champions (BCs) and Small-holder farmers (SHFs) with insurance initiatives. The CRAFT project team in Uganda reported that Beffe, Sebei, Okeba, Alito agribusiness (BC) partners had tried insurance with some 327 farmers. Most coverage started in season-B 2021. The premiums were Uganda Shillings (UGX) 30,000 (USD 9) per acre of land. But the project was providing a 50-percent subsidy on the premiums and farmers were paying the other 50-percent. The UGX 30,000 is already subsidized by the government, so the project was subsidizing further. However, the insured farmers did not receive a payout despite farmers having incurred losses through a drought, probably because insurance 'trigger points' were not met. It was noted that the insurer did not explain why a pay-out was not made. Attempts were also made to bundle insurance with fertilizer, but this also had its challenges. The barriers of cost of inputs and cost of information, coupled with the barriers of basis risk<sup>2</sup> (the risk that the index does not reflect the true situation on the ground) complicates the understanding by the BCs and SHFs, and consequently affects their buy-in to the concept of crop insurance.

### 4.1 Lessons from Kenya

CRAFT Kenya sought to be linked to Kenya Crop Insurance Project (KCIP) under the broader Kenya Agricultural Insurance Programme ([KAIP](#)). Both sides looked forward to the linkages. Further meetings were scheduled to firm up the institutional collaboration arrangement. Actual field activities on this collaboration were planned for 2023. The subnational scope of the collaboration was to cover four value chains across 15 of Kenya's counties where CRAFT Kenya Business Champions had a presence with over 71,000 SHFs. The value chains for Kenya agribusinesses are potato (eight counties), sorghum (six counties), common beans (two counties) and green gram (three counties), with some counties and value chains overlapping. The counties covered are presented in Table 2.

For seasonal, monthly and daily weather information, which was one of the barriers that hindered the roll-out of the index insurance internally under CRAFT, the CRAFT Kenya team was linked to Kenya Agricultural Observatory Platform ([KAOP](#)). KALRO-KAOP made a presentation of [KALRO Apps](#) which have solutions CRAFT Kenya could utilize. Several meetings were held, and presentations made (both at KALRO and at SNV Kenya) to strengthen mutual understanding both of the CRAFT project and the KALRO-KAOP initiative. The App list in the link has only 58 Apps but the actual list presented to CRAFT Kenya has over 65 Apps, some of which have not yet been uploaded. The Apps are available on Google's Play Store. Currently the CRAFT project and the KALRO-KAOP initiative are finalizing a collaboration memorandum of understanding (MoU) on digitalization and joint field agro-weather advisory services. The plan is to have a collaboration arrangement where CRAFT Kenya provides farmer details while KALRO-KAOP provides the farmers with the much needed downscaled, targeted weather information and agro-weather advisories through the KAOP SMS gateway. Further meetings are scheduled to firm up this arrangement. Actual field activities on this collaboration are planned to kick off in 2023. The counties covered are:

- Bomet - Potatoes
- Bungoma - Sorghum
- Busia - Sorghum
- Elgeyo Marakwet - Potatoes

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<sup>2</sup> The risk of error associated with gaps in data and information – the error in the correlation of an index in predicting losses. This error is recognized as the main drawback of index insurance products.

- Embu - Green gram and Sorghum
- Kakamega - Sorghum
- Kiambu – Potatoes
- Kitui - Green gram
- Laikipia – Potatoes
- Machakos - Beans
- Meru - Sorghum and Potatoes
- Nakuru - Beans and Potatoes
- Nandi – Potatoes
- Narok - Potatoes
- Nyandarua - Potatoes
- Nyeri – Potatoes
- Siaya – Potatoes
- Tharaka Nithi - Green gram and Sorghum
- Uasin Gishu - Potatoes

Areas identified by CRAFT Kenya for possible collaboration were:

- Incorporating CRAFT Kenya SHFs into the KALRO-KAOP database for them to start receiving weather/ advisory information.
- Digitization of CRAFT Kenya products e.g., Climate Risk Assessment reports, Suitability maps, training materials, etc.
- Digitization of SHFs details e.g., soil, vegetation characteristics, farm size, etc., to be able to receive customized advisories.

Areas identified by CRAFT Kenya for possible capacity building were:

- Capacity building of BCs on the digital solutions.
- Digitization of CRAFT's knowledge products e.g., CRA briefs, Training manuals etc.
- Increasing access to existing information – targeting CRAFT's beneficiaries (either general or user target information).
- Customize CI services to fit CRAFT's beneficiaries.

**Table 2: Kenya counties with CRAFT presence as at December 2022**

No.	County	Value Chain	No. of SHFs
1	Bomet	Potatoes/Beans	2087
2	Bungoma	Potatoes/Sorghum	660
3	Busia	Sorghum	2846
4	Elgeyo-Marakwet	Potatoes	2739
5	Embu	Sorghum	431
6	Kakamega	Sorghum/Potatoes	86
7	Kiambu	Potatoes	268
8	Kitui	Greengrams	8251
9	Laikipia	Potatoes	72
10	Machakos	Common Beans	1503
11	Meru	Sorghum/Potatoes	24756
12	Nakuru	Potatoes/Common Beans	7704
13	Nandi	Potatoes	2630
14	Narok	Potatoes	1097
15	Nyandarua	Potatoes	1808
16	Nyeri	Potatoes	20
17	Siaya	Potatoes	191
18	Tharaka-Nithi	Green gram/ Sorghum	10218
19	Uasin Gishu	Potatoes	468
<b>Total</b>			<b>71,325</b>

## 4.2 Lessons from Tanzania

Reliance Insurance Company Limited pledged to scale up index-based insurance in Tanzania in 2022. Subsequent documentation from CRAFT Tanzania shows that Kibaigwa, EAFF and TEMNAR business champions (BCs) had used insurance in their interventions. According to the CRAFT Tanzania report on index insurance: -

- Nondo BC did index insurance awareness and proceed to contact insurer but the number of farmers who wanted that service was not enough for the insurer to provide those services to Nondo farmers.
- Musoma, Mwenge, RIVACU, KMC, and Isowelu BCs had the insurance component in their case, but only farmers awareness meetings on the service were held.
- Ikuwo and Mpui didn't include insurance services in their business case.

For all the three BCs listed only awareness training had been done on insurance, and none of them had taken up insurance, whether peril-based or index-based (Annex 1). Reliance Insurance Company Limited paid some TSH 21,000 (USD 9) per acre for some peril-based insurance cover taken by Kibaigwa (i.e., Kibaigwa was not the contract/policy holder). If Reliance paid, then Kibaigwa did not own that insurance contract, and therefore was not responsible for it. This awareness was given for all the BCs and their farmers. Only Reliance Insurance Co. Ltd offered index-based insurance and only to TEMNAR BC. The other two BCs (Kibaigwa and EAFF) took up peril-based insurance with Reliance and Jubilee Insurance Co. respectively. Challenges mentioned in the template are presented in Table 3.

**Table 3: Insurance challenges faced by Tanzania CRAFT farmers & insurance service providers**

Challenges faced by farmers	Challenges faced by the insurance provider
<ul style="list-style-type: none"> <li>Quantification of the production cost as it varies from village to village, yet the insurance company wanted the standard production cost and productivity to be used.</li> </ul>	<ul style="list-style-type: none"> <li>Reluctant of the farmers to enroll into the programme.</li> <li>Limited staff to conduct the assessment.</li> </ul>
<ul style="list-style-type: none"> <li>Crop is new in the region, so farmers are hardly able to pay for the service.</li> <li>Absence of well calibrated gross margin among the many farmers as in their first season they experienced poor productivity due to consecutive wet days.</li> </ul>	<ul style="list-style-type: none"> <li>Absence of statistical index covering sunflower value chain in the region.</li> </ul>
<ul style="list-style-type: none"> <li>Drought.</li> </ul>	<ul style="list-style-type: none"> <li>Verification of claims.</li> </ul>

### 4.3 Lessons from Uganda

Reports were also received on the efforts CRAFT was making to link the BCs and SHFs with insurance initiatives in Uganda, despite the challenges they were experiencing with the intervention.

## 5. Critical Success Factors for Adoption and Scaling of Index-Based Insurance

Lessons from pilot initiatives<sup>3</sup> point to a number of critical success factors for adoption and scaling of index-based agricultural insurance, some of which are: -

- Incentives: insurance collateralizing index insurance for credit, providing subsidy, and providing conducive regulatory environment.
- Designing products that correspond to customers' actual/felt needs.
- Bundling several services with index-based insurance is considered part of a broader value proposition for farmers: insurance can be linked to credit from microfinance institutions (MFIs), input companies, off-takers (which guarantee the sale of production), farmer associations, mobile companies, and climate information services
- Aggregators play a key role in creating awareness and in product distribution, helping to increase access and to go to scale.
- Public sector (enabling environment) support from policymakers (governments and the donor community) for the uptake of index-based insurance helps in the development and implementation of agricultural index-based insurance programmes. There are three levels of public and donor involvement:
  - 1) providing premium subsidies and supporting the design of appropriate products integrated with safety nets, including supporting data capture.
  - 2) establishing consumer education/awareness programmes to stimulate demand/ uptake.
  - 3) introducing proportionate and supportive regulatory environments that accommodate different types of aggregators for product distribution.
- Effective coordination between different stakeholders, and effective partnerships, where each player gets value from participation. The value chain for agricultural index-based insurance comprises a diverse range of stakeholders:
  - Data providers and analysts are essential for product design.

<sup>3</sup> Marcantonio and Kayitakire.

- Insurers, reinsurers and actuarial experts are needed for product pricing and determining the level of cover.
- Aggregators<sup>4</sup>, including distribution channels and intermediaries, support processes to mobilize demand, client enrolment, payments of premiums and claims, complaints management and client communication.
- Policymakers, supervisors, donors and the media support in the development of an enabling environment.

## 6. Challenges, Gaps and Barriers to Adoption and Scaling of Index-Based Insurance

Index-based agricultural insurance has been sold as the most promising approach to minimizing the cost of verifying insured losses, thereby overcoming the limitations of conventional crop insurance. However, the penetration of index-based agricultural insurance has not achieved the expected results and, after now close to two decades, index-based agricultural insurance is still largely in the pilot stage. Key challenges to adoption and scaling of index-based agricultural insurance identified from pilot initiatives<sup>5</sup> are: -

- Data constraints: limited availability and accessibility of good quality data (both agricultural and climatic data) are the central problem for good index design, leading to challenges in designing appropriate insurance products. Less data leads to higher premium rates charged by insurers for index insurance products. Sometimes poorly designed products/contracts fail to provide compensation for losses: farmers pay premiums, losses occur, but no claims payments come through. This leaves the smallholder farmer worse off.
- Basis risk: Basis risk refers to the failure of index insurance to cover all losses that may be experienced by the insured. In particular, since the index insurance payout is based on an index, rather than verifiable losses, it is possible for the insured to suffer a significant loss without receiving a payout; conversely, it is possible for the insured to receive a payout without suffering a significant loss. The problem of the index failing to capture the loss is caused by a high adverse basis risk. On the converse, index-based insurance is also exposed to perverse basis risk, whereby an index might be triggered, and farmers receive a pay-out despite no damage or loss occurring to their crops. This undermines the basic principle of insurance (whereby a pay-out is made following a loss) and can reduce it to a form of gambling in more extreme cases.
- Low demand: Farmers and or their aggregators are not ready to buy stand-alone agricultural insurance products. The low demand for agricultural insurance is probably due to low awareness and weak understanding of how index-based insurance works
- Pricing dilemma: Due to lack of reliable data, pricing of agriculture insurance product is usually high (4% to 18%) compared to other classes of insurance leading to a catch-22 situation. Since data is scarce, uncertainty is high. The uncertainty is loaded onto the price, making the price high. Since price is high, penetration is low, and since penetration is low, prices cannot come down.
- Skepticism: low trust on the viability of index insurance has hindered uptake. Farmers still don't understand the payout mechanism.
- Target population: index-based insurance pilots have largely operated at the micro-level by targeting the last mile beneficiary – the farmer, fisher, pastoralist. A new conversation is gaining momentum to target aggregators at the meso level to generate more lessons on the most viable model for index insurance. If properly integrated into a lenders portfolio risk management and loan policies, index insurance

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<sup>4</sup> Aggregators can be defined as entities that bring together people for non-insurance purposes (for example retailers, service providers, utility companies, member-based organisations or civil society organisations) and that are then utilized by insurers, with or without the intervention of agents or brokers, to distribute insurance and, depending on the model, fulfil additional functions such as administration and/or claims pay-out

<sup>5</sup> Marcantonio and Kayitakire, "Review of Pilot Projects on Index-Based Insurance in Africa: Insights and Lessons Learned | SpringerLink."



could dramatically reduce the lenders exposure to catastrophic risk and promote the expansion of credit supply to subsistence farmers at lower interest rates, which in turn should spur increased adoption of higher-yielding agricultural technologies.

## 7. Conclusions and Recommendations

### 7.1 Conclusions

It is generally agreed that there is a gap in the index-based agricultural insurance market caused by the market failure of low demand chasing high supply, but the flip question is whether there is a market in the gap in the first place to justify the efforts to scale index insurance. Suppose basis risk, which seems to be the principal barrier, is addressed, can the demand grow? A review of available information shows that penetration rate for agricultural insurance is strongly dependent on the support of public authorities, and that the more support provided by public authorities to farmers, the more involved the latter get by underwriting insurance policies. However, in Africa, which is relevant to the CRAFT Project, public authorities are least forthcoming in supporting agricultural insurance, hence the poorest turnovers reported in the continent.

From the narrative above, it can be concluded that there occurred changes in strategy, at different stages of the project, on how the insurance intervention in CRAFT was to be approached. The strategic changes affected implementation, making the insurance component of the project not to take off in good time.

As captured in this review, bundling is touted as a viable strategy to catalyze the scaling of index insurance, but can collateralizing index insurance work? Does it reduce loan defaults if the lender doesn't up their game? Is index insurance bundling a substitute for strong loan recovery practices? Or can it compensate for weak loan recovery practices? What if, instead of targeting smallholder farmers, the index insurance cover is offered to lenders, input suppliers, processors, and exporters strengthen the agricultural value chain in general, with farmers benefiting indirectly.

### 7.2 Recommendations

1. Policy dialogue: Public sector support to index-based agricultural insurance is a policy issue that requires concerted dialogue given that, as a climate change concept, index-based insurance has both a public good element and a private good element. Public sector support for agricultural insurance may be needed in the following areas:
  - a. Generation of common data for development of the index that is specific to agricultural risks.
  - b. granting subsidies for the underwriting of insurance premiums to low-income farmers: Wherever possible, the subsidy should crowd in private insurers and encourage competition.
  - c. funding of campaigns designed to promote insurance plans: management of costs pertaining to research and development, data collection, training, etc.
2. Scaling model: An effective Public-Private Partnership (PPP) with government support is the most viable pathway to reaching scale. Quote: "Several CSA interventions started out as pilots implemented by researchers, EAS providers, NGOs and the private sector, but upscaling only really happened when the practices became a state/national policy and started receiving public investments and programmatic support from state agencies." Non-State pathways of scaling "are likewise dependent on state support, since their upscaling is contingent on the presence of favorable regulations..." – FAO 2018.

- a. Since index-based insurance has both private and public good elements due to its association with climate change, only a consortium/ pool approach can effectively address the insurance inherent challenges in the model.
- b. Government/public sector subsidies will help to lower the cost of premiums for small holder farmers and low-income households to afford or to appreciate the value of insurance initially.
- c. The Govt takes up the role of data collection and the public good aspects of the index insurance programme.

Consumer education for awareness and protection: Building trust in agricultural index-based insurance requires a joint effort from insurers and regulators, for example by implementing joint consumer education strategies. Experience shows that considerable time is needed for insurance to gain traction, and for this to happen premiums have to be subsidized for a number of years as farmers become familiar with the terms of the policy. The varied impacts of shocks within a small area are often not discernible from satellite imagery, thereby requiring the expense of fielding teams to conduct crop cuts.

## References

- Marcantonio, Federica Di, and François Kayitakire. "Review of Pilot Projects on Index-Based Insurance in Africa: Insights and Lessons Learned | SpringerLink." Accessed January 15, 2023. [https://link.springer.com/chapter/10.1007/978-3-319-59096-7\\_16](https://link.springer.com/chapter/10.1007/978-3-319-59096-7_16).
- Osumba, Joab J. L., and John W. M. Recha. "Scoping Study Brief - State of Index-Based Crop Insurance Services in East Africa," December 2019. <https://cgspace.cgiar.org/handle/10568/107337>.
- Osumba, Joab J. L., John W. M. Recha, Teferi Demissie, Helena Shilomboleni, Maren A. O. Radeny, and Dawit Solomon. "State of Index-Based Crop Insurance Services in East Africa: Findings from a Scoping Study to Establish the State of Index-Based Crop Insurance Services in Kenya, Tanzania and Uganda," November 11, 2020. <https://cgspace.cgiar.org/handle/10568/110122>.
- Sulaiman, R., D. Chuluunbaatar, and S. Vishnu. Upscaling Climate Smart Agriculture: Lessons for Extension and Advisory Services. Rome, Italy: FAO, 2018. <https://www.fao.org/documents/card/en/c/I9209EN/>.

# Annexes

## Annex 1: Index-based crop insurance under CRAFT Tanzania

BC	Type of insurance cover taken (e.g., credit-based, peril-based, index-based, etc.)	Name of insurance company	Date when farmers were covered	Crop covered	Which seasons have been covered under CRAFT?	# SHFs covered per named BC	Which index is being covered, if peril-based?	Which index is being covered, if index-based?	How much premium was paid per acre	Who pays the premium for the cover?	Is there co-payment agreement on the premium?	If there is a co-payment agreement, who pays how much of the premium	Payouts (if there has been any payout)	Challenges faced by farmers	Challenges faced by the insurance provider
Nondo				Sunflower											
KMC				Sunflower											
Mpui				Sunflower											
Ikuwo				Common beans											
EAFFC	Peril based	Jubilee Insurance	Only awareness on the named insurance was done and farmers were yet to register as the season was over	Potato	none	433 farmers (249 males and 184 females)	Frost, Fog, and Wilting	N/A	N/A	Farmers	N/A	N/A	N/A	Quantification of the production cost as it varies from village to village yet the insurance company wanted the standard production cost and productivity to be used.	Reluctant of the farmers to enroll into the program Limited staff to conduct the assessment
Isowelu				Potato											
Vibinjo	N/A	N/A	N/A	Common beans	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KSR				Sunflower											
Kibaigwa	Peril	RELIANCE INSURANCE	Jan-21	Sorghum	2020/2021	130	MPCI	N/A	21000	COMPANY	N/A	N/A	YES	DROUGHT	VERIFICATION OF CLAIMS

BC	Type of insurance cover taken (e.g., credit-based, peril-based, index-based, etc.)	Name of insurance company	Date when farmers were covered	Crop covered	Which seasons have been covered under CRAFT?	# SHFs covered per named BC	Which index is being covered, if peril-based?	Which index is being covered, if index-based?	How much premium was paid per acre	Who pays the premium for the cover?	Is there co-payment agreement on the premium?	If there is a co-payment agreement, who pays how much of the premium	Payouts (if there has been any payout)	Challenges faced by farmers	Challenges faced by the insurance provider
Rivacu				Common beans											
Mwenge				Sunflower											
Temnar	index-based	Reliance Insurance Company (Tanzania) Limited,	Awareness only	Sunflower	none	217 (95 males, 122 female)	N/A	draught/ pest infestation	N/A	N/A	N/A	N/A	N/A	Crop is new in the region so farmers are hardly able to pay for the service. Absence of well calibrated gross margin among the many farmers as in their first season they experienced poor productivity due to consecutive wet days.	Absence of statistical index covering sunflower value chain in the region.
Musoma				Sorghum											



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