Agricultural insurance for smallholder farmers

Digital innovations for scale

GSMA AgriTech Programme

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Authors
Rishi Raithatha and Jan Priebe, GSMA AgriTech Programme

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Steven Kimmoh Ouma
Subasis Barua (Green Delta Insurance)
Ali Tareque (Green Delta Insurance)
Thomas Wiechers (FSD)
Tinotenda Mhiko (Cassava Smartech)

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Executive summary

The income and livelihoods of smallholder farmers are increasingly affected by financial shocks and natural forces beyond their control, such as extreme weather or crop damage from pests and diseases. Globally, less than 20 per cent of smallholder farmers have insurance to protect themselves against the impact of unexpected events.

Smallholder farmers have been unable to access indemnity-based insurance services, which require farm-level loss assessments. Low awareness and knowledge of insurance, coupled with the high cost of premiums, have restricted farmer uptake. Insurance providers have largely overlooked smallholder farmers due to the cost of acquiring and serving rural customers in remote locations, making farmers a less profitable customer segment for the industry.

The emergence of index insurance, which makes payouts based on a predetermined index rather than on-farm visits, has overcome some of the challenges of indemnity-based models, such as high operational costs, the cost of premiums and the ease of settling claims.

Over the last 10 years, index insurance services have been using mobile and satellite technology to digitise service creation and delivery, enhancing their potential to scale. There are further opportunities for mobile network operators (MNOs) to use mobile technology to register and locate farmers, and use mobile money to collect premiums and pay out claims.

Smallholder farmers are increasingly using index insurance services, especially digitally enabled ones, as a safety net against crop or livestock losses. However, despite the ease of access of most index insurance services and stronger digital value propositions, most smallholder farmers have yet to fully adopt index insurance.

Index insurance service providers face a variety of challenges, from poor availability of historical and current weather data, and difficulties providing certain index insurance services (e.g. area-yield index insurance) without government support, to distributing their services efficiently. To overcome the challenge of weather data scarcity and complement existing data sources, such as remote data from satellites, MNOs have an opportunity to use base stations to co-locate automated weather stations and commercial microwave link data from mobile networks to monitor rainfall.[1]

Different actors can be the lead service providers of index insurance services, such as insurers, technical service providers (companies that offer administrative and technical input for insurance services) or MNOs. Under each model, partnerships with organisations trusted by farmers, such as agro-dealers, extension agencies and NGOs, are key to distributing index insurance services.

Meanwhile, bundling and cross-selling index insurance with other value-added services is key to driving uptake amongst farmers. Bundling allows farmers to access a suite of relevant services, such as agronomic advisory and input loans. Cross-selling index insurance with other types of insurance, such as health insurance, offers farmers greater cover for their risks and can often allow insurance providers to cross-subsidise the cost of index insurance services.

1 Commercial microwave links (CML) are ground-level radio signals used in mobile telecommunication networks globally. During rainfall, these signals are attenuated, leading to changes in the signal strength between transmitting and receiving base stations. Using an algorithm, CML data can be analysed and converted into realistic and accurate rainfall measurements, effectively turning a mobile network into a virtual network of rain gauges.

1 Introduction

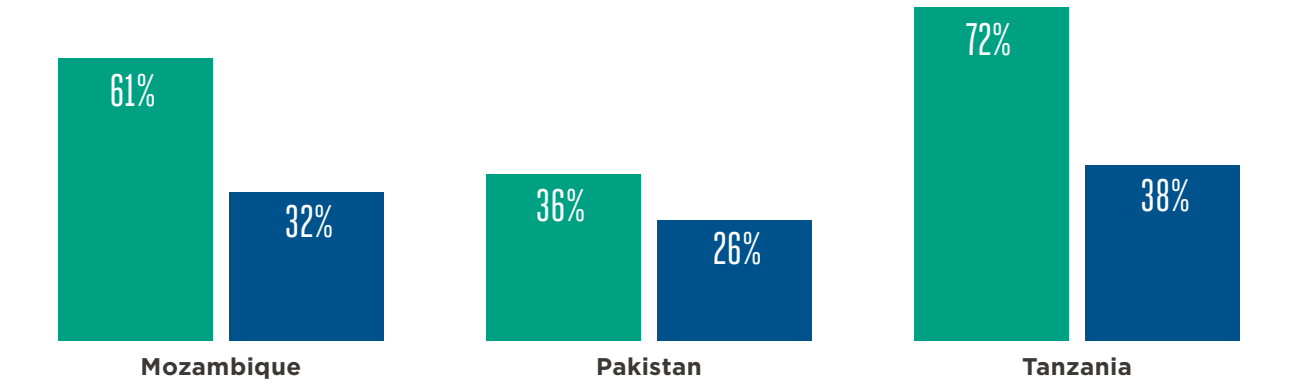
1.1 The insurance gap for smallholder farmers in developing markets

Smallholder farmers face a range of shocks and challenges beyond their control that can have a drastic impact on their incomes and livelihoods. These include unexpected non-agricultural events, such as health problems, and agricultural events, such as market and price fluctuations or pest and disease infestations.

Climate change is a key driver behind agricultural shocks. More frequent extreme weather events and an increase in the incidence of pests and diseases are increasing financial losses for farmers in developing countries (Figure 1).[2]

Figure 1

Impact of climate risks on farmers in Mozambique, Pakistan and Tanzania, 2016[3]

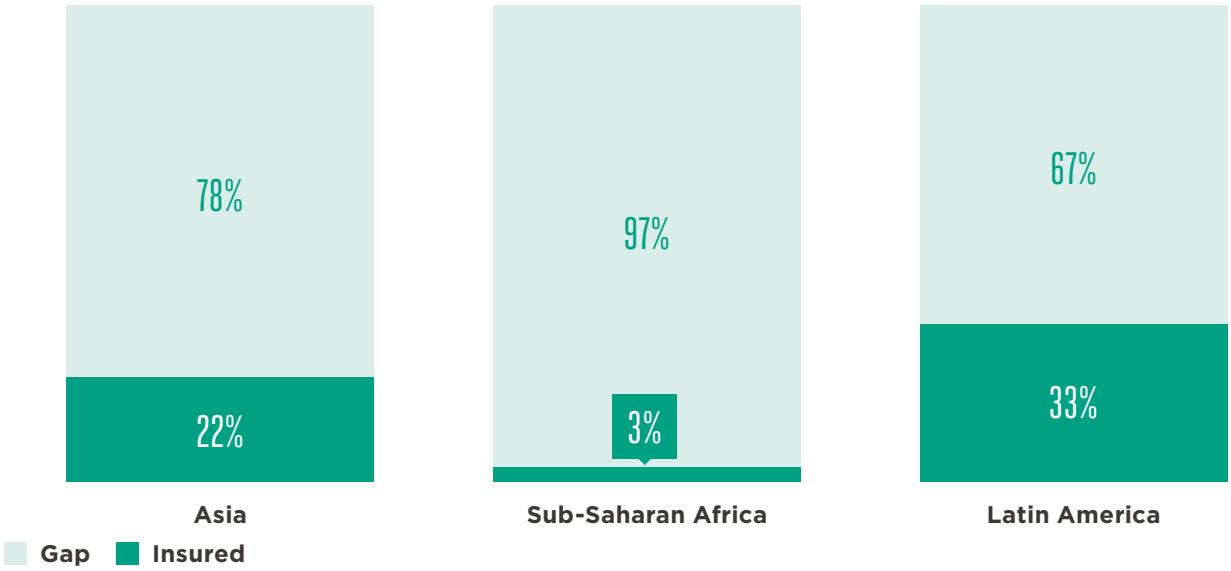


Source: CGAP (2016), *Smallholder diaries*.

2 Shakhovskoy, M. and Mehta, R. (2018), *Protecting growing prosperity: Agricultural insurance in the developing world*.
3 Anderson, J. and Ahmed, W. (2016), *Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania, and Pakistan*. CGAP.

Figure 2

Gaps in smallholder insurance coverage across regions, 2018



Source: ISF Advisors (2018), *Protecting growing prosperity.*

Insurance services in developing countries can struggle to offer safety nets for such shocks. Globally, less than 20 per cent of smallholder farmers have any form of agricultural insurance, and across Sub-Saharan Africa, this figure is less than three per cent (Figure 2).[4]

The insurance coverage gap is due to a range of demand-side and supply-side factors (Figure 3). On the demand-side, lack of awareness of insurance services, largely due to the low penetration of financial services in rural areas, is a key barrier to uptake. Even when farmers are aware of insurance, insufficient knowledge and understanding of financial services means they may not immediately trust the service provider or their ability to pay out a claim as promised. For farmers who are aware of insurance, they are only likely to use it if they understand how the service works and the value it offers.

Insurance uptake amongst smallholder farmers has also been constrained by two potential costs: the cost of insurance premiums and the cost of travelling to nearby towns to register for services and make claims. Governments have used subsidies to lower premiums and drive farmer uptake in Kenya, India and Pakistan.. However, subsidies can sometimes be restricted to government-mandated schemes or to specific agricultural insurance services and are often short lived. For example, Hollard Insurance conducted a pilot to provide insurance to cotton farmers in Mozambique in 2012 with support from the World Bank. However, the scheme ended in 2013 due to a lack of support from key stakeholders.

4 Shakhovskoy, M. and Mehta, R. (2018), Protecting growing prosperity: Agricultural insurance in the developing world.

Figure 3

Demand- and supply-side barriers to the uptake of agricultural insurance

Demand-side barriers	Supply-side barriers
Low awareness of insurance	Insurance services for smallholder farmers can be costly and complicated to design
Low trust in the provider and the chance of receiving a payout	Distribution and operations: smallholder farmers are expensive customers to acquire and serve
Poor understanding of how insurance works	Low profitability potential due to low premiums
High cost of premiums and lack of government subsidy	Difficult to provide some policies without government support and subsidies
Difficult to register and claim, which requires travelling to a nearby town	
The insurance cover on offer is not needs-specific	

From the perspective of an insurance service provider, a higher incidence of catastrophic events, such as droughts, would require larger and more frequent payouts. Covering such agricultural risks can be costly for providers, who would struggle to design insurance services that are both affordable and offer adequate cover.[5] Distribution is also a key challenge, as reaching and serving smallholder farmers can be logistically difficult and expensive. Given that smallholder farmers are price sensitive, insurance providers often perceive them as a low-profit customer segment, deterring them from offering agricultural insurance altogether.

Without access to formal insurance schemes, smallholder households resort to traditional risk management schemes, such as self-insurance and community funds. Self-insurance involves growing a mix of crops, using pest- or drought-resistant crop varieties, staggering planting dates, spreading crops out over their fields and investing in livestock. Farmers may also engage in off-farm employment or non-farm business to reduce their dependence on farming. However, self-insurance can be costly and ineffective against major weather shocks. Community funding schemes, in which farmers pool savings to support those who need financial help, may not always provide an adequate safety net. A key challenge is that traditional risk management schemes are unable to cater for covariate risks, which refer to catastrophic events that affect many farmers in the same region at the same time.[6]

5 Hess, U. and Hazell, P. (2016), *Innovations and Emerging Trends in Agricultural Insurance*. GIZ.
6 Ibid.

1.2 Overview of agricultural insurance services

With agricultural insurance services, the insured party (the farmer) pays a premium to an insurer to guarantee against losses (of crops, assets, property, livestock or income) over a defined period. These losses can be caused by perils such as extreme weather events (e.g. drought and floods), the onset of pests and diseases or the death of livestock. The insured party is given a promise by the insurer to indemnify them (be paid back) in the event of a loss.[7] While different types of agricultural insurance are available (Figure 4), crop insurance is the most common service offered to smallholder farmers in developing markets.

Figure 4

Types of agricultural insurance

Historically, farmers have been limited to indemnity-based insurance services. Indemnity-based insurance pays out claims based on an actual loss incurred by an insured party. In the event of a disaster, a certified loss assessor conducts an objective loss assessment to determine the compensation due.[8] While large farms may still use indemnity-based insurance, this type of insurance is unaffordable for most smallholder farmers worldwide.[9]

Today, innovative approaches like index insurance offer smallholder farmers an affordable and accessible way to manage agricultural risks. Index insurance is a type of insurance service that pays out benefits based on a predetermined index, such as rainfall level for losses resulting from weather and catastrophic events.[10] Index insurance provides cover against specific perils across a defined area rather than at the farm level.[11]

Unlike indemnity-based services, index insurance does not require individual claims to be assessed, allowing them to be settled through a quicker, more objective process. Indices are developed prior to the planting season and are used to measure deviations from typical levels of common parameters such as rainfall, temperature, crop yield and livestock mortality rates. Farmers can buy policies based on an index correlated with a specific event, such as rainfall, drought or yield losses, for a certain period and across a defined area. Payouts are automatically made when an index falls above or below a predetermined threshold.

Two types of index insurance services have traditionally been available to smallholder farmers: area-yield index (AYII) and weather index insurance (WII). Area-yield index insurance services are similar to indemnity-based services, with assessments made at one farm against a predetermined index for a given area.[12] With weather index insurance, payouts are based on the occurrence of a specific weather event over a specified period in a defined area. Early weather index insurance

7 Agricdemy (20 December 2016), *Agricultural Insurance*.
8 Sandmark, T. et al. (2013), *The Emergence and Development of Agriculture Microinsurance: A Discussion Paper*.
9 Carter, M. et al. (2017), "Index Insurance for Developing Country Agriculture: A Reassessment", *Annual Review of Resource Economics*, 9, 421–38.
10 Index Insurance Forum: indexinsuranceforum.org
11 Hess, U., & Hazell, P., (2016). *Innovations and Emerging Trends in Agricultural Insurance*. GIZ.
12 Index Insurance Forum: indexinsuranceforum.org

services involved assessments at weather stations that held paper-based rainfall records. While early index insurance gave many farmers their first experience with agricultural insurance, these services were not easily scalable due to the operational costs and effort required, and the use of indices based on incomplete datasets.

Over the last decade, the growth of digitally enabled index insurance services has overcome some of the limitations of indemnity-based and early index insurance services. From a farmer's perspective, new index insurance services are more affordable, have clearer and faster payouts and cover specific perils. Index insurance services have also largely dealt with the issues of moral hazard and adverse selection (Figure 5).[13] A moral hazard occurs when a farmer intentionally allows crops to fail to receive a payout. Adverse selection refers to when a farmer takes out additional insurance policies knowing they are likely to receive a large claim payout.[14] Given that all index insurance policyholders in a region pay the same premium and receive the same payout, an index-insured farmer and an uninsured farmer will have the same economic incentives to ensure that their crops can be harvested.[15]

Figure 5

Characteristics of different types of agricultural insurance[16]

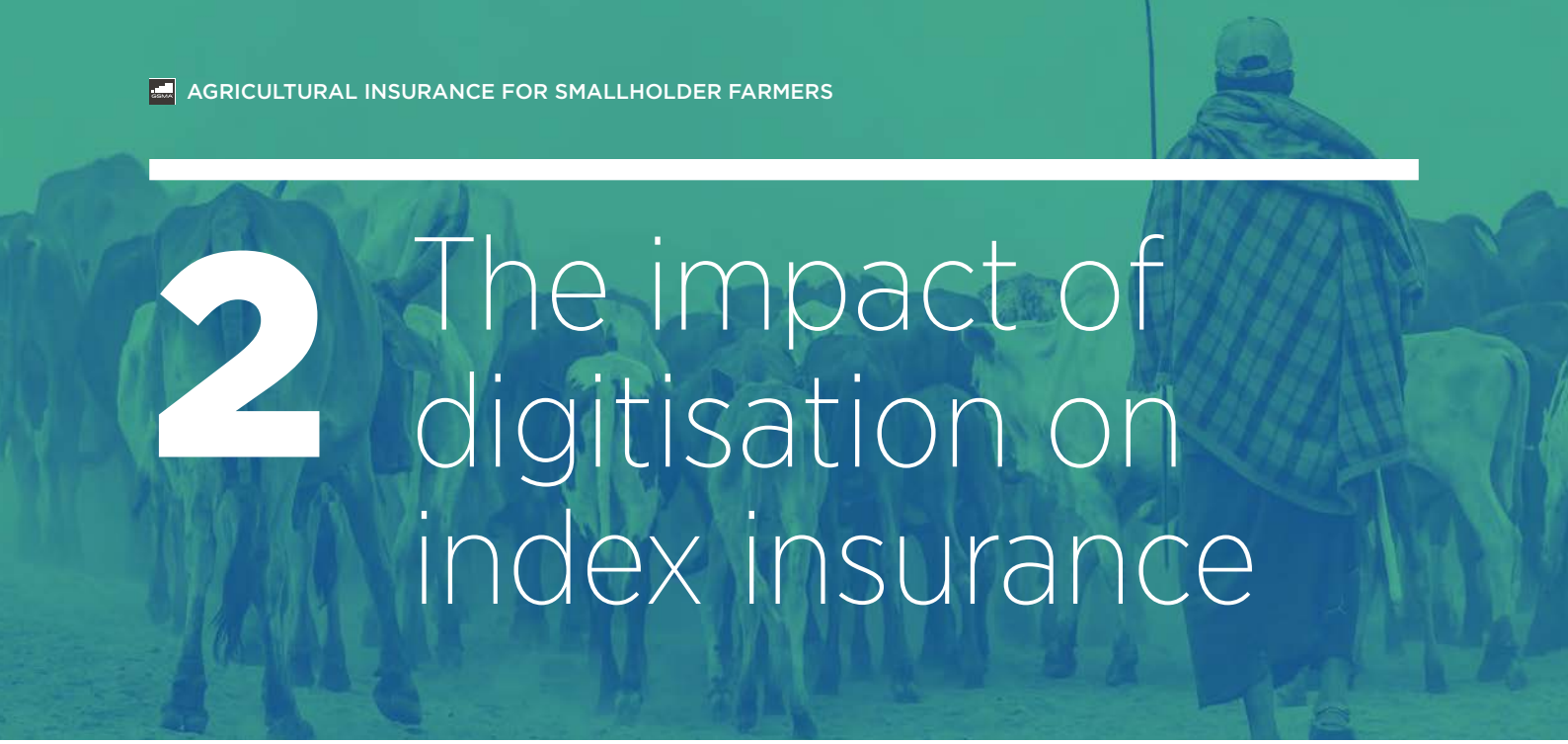
	Set-up costs	Operational costs	Claim settlement speed	Risk of moral hazard and adverse selection	Basis risk	Actuarial difficulty
Indemnity-based	Medium	High	Slow	High	Low	Low
Area-yield index	Low	Medium	Slow	Low	Low	Low
Weather index	High	Low	Fast	Low	High	High

One drawback to index insurance, and weather index insurance in particular, is the incidence of basis risk, which is the difference between the actual loss incurred by a farmer and the loss determined by the index.[17] An index calculated as an average for an area will be accurate for most farmers, but may not reflect the experiences of those farming on the fringes. Basis risk events occur when a calculated average index does not reflect actual losses or when weather stations, satellites or other data sources provide imprecise measurements. Basis risk events can also be caused by factors not covered by insurance policies, such as when a farmer with a weather index insurance policy suffers losses due to a pest infestation.[18]

Recent index insurance services use technology to automate and digitise key steps in service creation and delivery, such as satellites and automated weather stations (AWS) to collect the weather data needed to calculate indices. As national and international space programmes expand their satellite networks and operate increasingly powerful instruments, more frequent and higher resolution remote sensing data is becoming available for the development of WII services.[19] Many index insurance providers have taken advantage of the increased adoption of mobile phones and mobile money to provide services to farmers in remote locations. However, there is an opportunity for mobile technology to play a bigger role in creating and delivering index insurance services.

This report looks at how mobile network operators (MNOs) can use their assets to drive the adoption of index insurance services in developing countries. Using primary and secondary research, we analyse the challenges service providers face in scaling index insurance and the potential opportunities for growth through partnership-based approaches. This report is aimed at index insurance service providers (insurers, technical service providers (TSPs) and MNOs or mobile money providers), MNOs and fintechs planning to launch index insurance services, and donors and investors seeking to support index insurance initiatives.

13 Hess, U., & Hazell, P., (2016). *Innovations and Emerging Trends in Agricultural Insurance*. GIZ.
14 Greatrex, H. et al., (2015), *Scaling up index insurance for smallholder farmers: Recent evidence and insights*. CGIAR/CCAFS.
15 Hess, U., & Hazell, P., (2016). Innovations and Emerging Trends in Agricultural Insurance. GIZ.
16 GSMA AgriTech analysis
17 Sandmark, T. et al. (2013), *The Emergence and Development of Agriculture Microinsurance: A Discussion Paper*.
18 Ibid.
19 Recent developments include the European Space Agency's (ESA) continued launch of Sentinel satellites under the Copernicus programme, which will expand ESA's publicly available remote sensing data.



2 The impact of digitisation on index insurance

2.1 Digitising the creation and delivery of index insurance services

Area-yield index (AYII) and weather index insurance (WII) depend on having specific data available for service development and monitoring. Advances in digital data sources such as remote sensing, and data analysis such as machine learning, have spurred the growth of these services globally.

Area-yield index insurance

With AYII, service providers give farmers a reference yield for their farm, which is calculated as a proportion of the average yield based on historical data. Regardless of the actual yield, a farmer will receive a payout if the calculated average yield for an area is less than the reference yield for their farm.[20] Area-yield indices are developed using historical data from local authorities, which can often be difficult to obtain.[21] AYII covers multiple perils such as flood, drought, pests and diseases. Average yields are calculated by loss assessors using crop cutting experiments in which produce from randomly selected farms is analysed for parameters such as biomass, grain weight and moisture.

AYII has benefited from digitisation in several ways. For instance, partnerships with agribusinesses that share digital records of historical yields and area-yield data per farmer at the end of a season can greatly reduce the need for crop cutting. Insurance companies such as Pula are also using machine learning to allocate farmers to areas with similar agro-climatic conditions. Rather than using administrative borders, farmers are being allocated to areas based on yield potential derived from historical yields, soil quality and microclimate. In doing so, Pula has reduced the number of areas required for crop cutting to establish an average yield.

20 Index Insurance Forum: indexinsuranceforum.org
21 Sandmark, T. et al. (2013), *The Emergence and Development of Agriculture Microinsurance: A Discussion Paper*.

Weather index insurance

Digitisation has dealt with some of the specific challenges faced by weather index insurance services. Since index insurance services require historical datasets to create and run indices, limited weather station coverage across developing countries means that rural weather data is often patchy or simply unavailable. Creating reliable risk models typically requires at least 10 years of data from the monitoring source. The increasing affordability and accessibility of satellite data, and the declining cost of AWS have resulted in better coverage, more extensive historical data and access to near real-time weather data.

These new data sources have enabled better rainfall monitoring and more accurate claim settlements for farmers covered by WII services. Real-time monitoring has led to faster payouts, which are calculated based on an agreed insured amount per unit of the index, for example, dollars per millimetre of rainfall.

Normalised differentiation vegetation index insurance

In addition to transforming index insurance services, satellite data has also led to the creation of new services, such as normalised difference vegetation index (NDVI) insurance. NDVI is based on the moisture absorption of plants during photosynthesis and is used to monitor the loss of grazing land due to natural disasters.[22] Although NDVI can cover multiple perils, it is currently limited to index-based livestock insurance in Kenya and Ethiopia where sparse vegetation is used as a proxy for animal mortality rates.[23]

22 Sandmark, T. et al. (2013), *The Emergence and Development of Agriculture Microinsurance: A Discussion Paper*.
23 Greatrex, H. et al., (2015), *Scaling up index insurance for smallholder farmers: Recent evidence and insights*. CGIAR/CCAFS.

2.2 How index insurance providers have used mobile technology

Increasing mobile penetration has allowed insurance providers to distribute index insurance services to smallholder farmers that have traditionally been excluded. For example, index insurance providers, such as ACRE Africa, Pula and OKO, use mobile communication channels (voice, SMS, USSD,[24] IVR[25] and data) to register and communicate with their customers. Some services can also triangulate farmer locations using location-based services. For example, the locations of farmers registering for ACRE Africa's WII via USSD are automatically triangulated and captured. Where farm locations cannot be captured automatically, farmers are called and asked to verify the nearest school (the location of which ACRE Africa already knows). Mobile money is also used to collect premiums and pay out claims digitally.

Despite these initiatives, there is an opportunity for index insurance providers to further digitise their services (Figure 6). Around half of these providers have digitised their payouts and some have also digitised their registration process. However, around half of index insurance providers still rely on non-digital channels for service delivery.

Figure 6

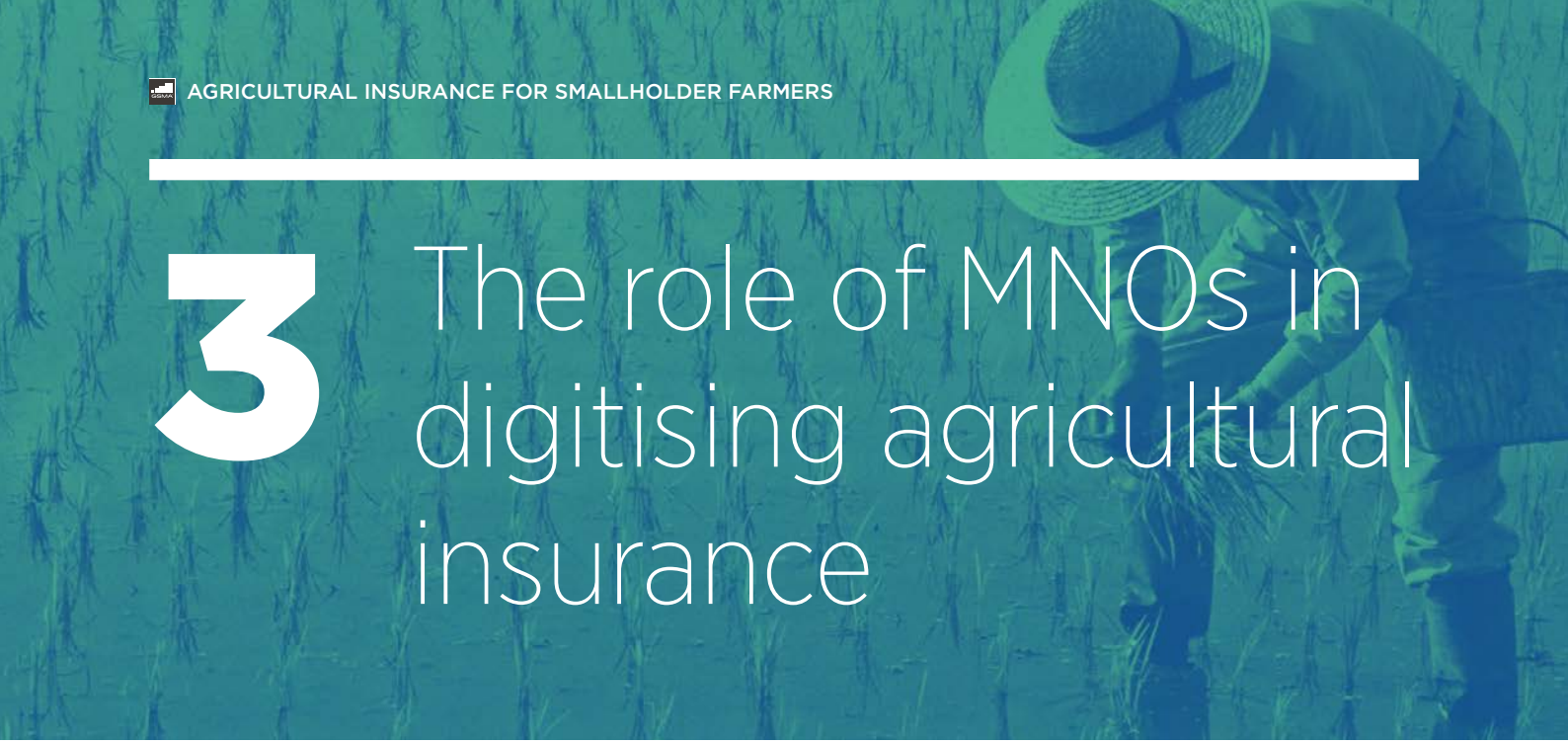
Level of digitisation across index insurance providers

Increasing level of digitisation ▸

Cash pay-out		Digital pay-out
Face-to-face registration		Digital registration
CARD Pioneer	APA Insurance	ACRE
GAIP	KLIP	Blue Marble Insurance
Green Delta Insurance	Mayfair Insurance	Econet (EcoFarmer)
Hollard Insurance		OKO
Ibisa Network		Pula
ICICI Lombard		Safaricom (DigiFarm)
Inclusive Guarantee		Sanasa
PMFBY		WorldCover

While digitisation has partially resolved problems such as data scarcity and claim payouts, distribution remains a key challenge for both farmers and insurance service providers. Few services have reached scale without relying on distribution partnerships or being bundled with other relevant services. Almost 90 per cent of all index insurance services are either bundled or offered together with credit, inputs or agronomic advisory.[26] Partnerships with agro-dealers and extension agencies, cooperatives and farmers' unions provide a customer base, and touchpoints to sell policies and educate farmers on how index insurance services work and the value they provide. However, farmers that cannot be reached through such partnerships risk being excluded from insurance services.

24 USSD: Unstructured Supplementary Service Data
25 IVR: Interactive voice response
26 Shakhovskoy, M. and Mehta, R. (2018), *Protecting growing prosperity: Agricultural insurance in the developing world*.



3 The role of MNOs in digitising agricultural insurance

MNOs have a role to play in creating, contextualising and delivering agricultural insurance services. By using their assets to enable further digitisation, they can help resolve the challenges facing index insurance service providers. The following sections will discuss the improvements and outstanding challenges at each level of digitisation.

Figure 7

Opportunities for digitisation across the agricultural insurance value chain

	Service creation		Contextualisation	Service delivery	
	1 Collect	2 Analyse	3 Locate	4 Pay	5 Bundle
Indemnity-based insurance	• Historical data (yields, specific perils) • Claim-specific data from affected sites	• Create actuarial models • Determine individual claim pay-out	• In-person registration of individual users, or user groups via field agents, local NGOs, agri extension workers	• Cash payment of premium to insurance representative • Cash payment of claim through insurance representative	• Bundle multiple types of insurance cover
Index insurance (insurtech value-add)	• Historical index data • Current weather data monitoring	• Create actuarial models; define triggers, premiums & payouts • Assess triggers & payouts	As above, OR: • MNO integration via APIs • Digital user registration • GPS via apps	As above, OR: • Automatic claim payout via mobile money	As above, OR: • Agri-advisory services (e.g. weather, good agricultural practices, market prices)
MNO value-add	• MNO data (CMLs) • Co-location of AWS with base station • Connectivity (cellular internet, WIFI, LPWAN)		• Network-based CDR • Triangulation via LBS • User registration (SIM registration, voice, field agents	• Mobile money as a payment method for premiums and claims • Premium collection via airtime deduction	• Other financial services (credit savings) • Other value-added services

▼ Increasing level of digitisation

3.1 Service creation: generating new data to improve weather models

MNO assets provide several opportunities to support the collection of meteorological data required to create and run weather index insurance products. MNO base stations provide opportune locations to install AWS, as they are secure sites with access to their own electricity supply. Weather station data can be used in isolation to provide rainfall index insurance products for the immediate vicinity, or they can provide the "ground truth" for modelled indices that draw data from several sources. MNOs can also invest in co-locating weather stations at base station sites to generate weather data for climate resilience services.

The use of commercial microwave link (CML) data for rainfall monitoring is another opportunity for MNOs to collect meteorological data. CMLs are close-to-the-ground radio connections used worldwide in mobile networks to connect the core network and smaller, peripheral networks. MNOs already collect signal levels to monitor the health of their mobile network. During rainfall, the radio signals used in CMLs are absorbed or scattered by raindrops, reducing signal strength between the transmitting and receiving tower. These reductions can be converted through algorithms into highly accurate rainfall estimates. Given the geographic coverage and density of mobile networks, CML presents an opportunity to improve the temporospatial resolution of available precipitation data in developing countries.[27]

Several organisations are leading research in this area. For example, the GSMA[28] is working in collaboration with Wageningen University and Research and the Royal Dutch Meteorological Institute to develop the capability of mobile operators in Asia and Sub-Saharan Africa to generate rainfall data from their mobile networks. Ericsson[29] conducts similar research in East Africa in collaboration with the Swedish Meteorological and Hydrological Institute. ClimaCell provides micro-weather services based largely on CML to private sector clients and has recently collaborated with Google Cloud to provide open weather forecasts for India.[30]

Data from co-located weather stations and CML can improve the availability of meteorological data for WII products. This, in turn, could enable the provision of index insurance to previously uncovered areas and reduce the gap between actual and estimated losses, lowering the basis risk. Both CML and weather station data are well suited to precipitation insurance products, such as excess rainfall insurance and rainfall index insurance. However, since no historical data sets are typically available for these new data sources, calibrating with existing data sources or accumulating historical data is necessary to develop actuarial models. Making this weather data publicly available is another consideration and may be required by regulators for oversight. Sharing near real-time weather data can also be a way to build trust in the insurance service as it makes a complex service more understandable and empowers customers to monitor their right to a claim payout.

27 To see examples of how CML data is used for rainfall monitoring, watch: http://youtu.be/LAR6K5-tBYs
28 Raithatha, R. and Tricarico, D. (2019), *Mobile technology for rural climate resilience: The role of mobile operators in bridging the data gap*. GSMA.
29 The Weather Data Incubation Project – The Ericsson ONE Unit: https://www.ericsson.com/en/cases/2018/SMHI
30 ClimaCell (7 January 2020). *ClimaCell Announces Collaboration With Google Cloud on Weather Forecasting With 5X Jump in Resolution, Starting in India*.

3.2 Contextualisation: registering and locating users

As mentioned in section 2, a key part of providing WII products is localising users and their farm plots. Payouts are currently based on defined agro-climatic zones, which are areas sharing similar climatic conditions. Allocating customers to a zone based on the location of their fields is necessary to deliver services. Index insurance providers currently use several approaches to locate users. Non-digital approaches include registration via agricultural cooperatives, NGOs or extension agents. In these cases, typically a sub-national administrative region, such as a local government area, is used to represent a location.

This approach has several drawbacks. Collecting location data in person can be somewhat imprecise, limiting scalability and increasing basis risk. Automating the collection of user location data via smartphones using GPS can overcome this challenge. However, the use of GPS has limited potential for scalability due to low adoption rates of smartphones in rural areas.

MNOs can support the localisation process in several ways. Call detail records (CDR) provide meta-data on calls made by users, including the base stations at which the calls originate and terminate, which can be used to infer a user's location. Location-based services (LBS) require software to refine this approach and triangulate a user's location from the towers in their vicinity, providing even greater accuracy. Integration of these services with an insurance product's registration process can eliminate the need for manual localisation of users, thereby reducing costs and increasing scalability. Where an automated approach is not possible, an MNO's agent network can provide a face-to-face marketing channel to register users for the index insurance service and record locations in the process. This approach requires training and educating agents about the service, and offering incentives to promote sales.

3.3 Service delivery: improving distribution and enabling payments

Face-to-face user registration continues to be the most common distribution method among current WII service providers. This is often due to several factors, such as the need to educate customers about the product, inaccessibility to appropriate digital channels, the challenge of locating users and challenges with collecting premiums digitally. As mentioned in section 2, MNOs' basic delivery channels (USSD, SMS, IVR) provide valuable opportunities to digitise all or parts of the service delivery process (Figure 8).

Figure 8

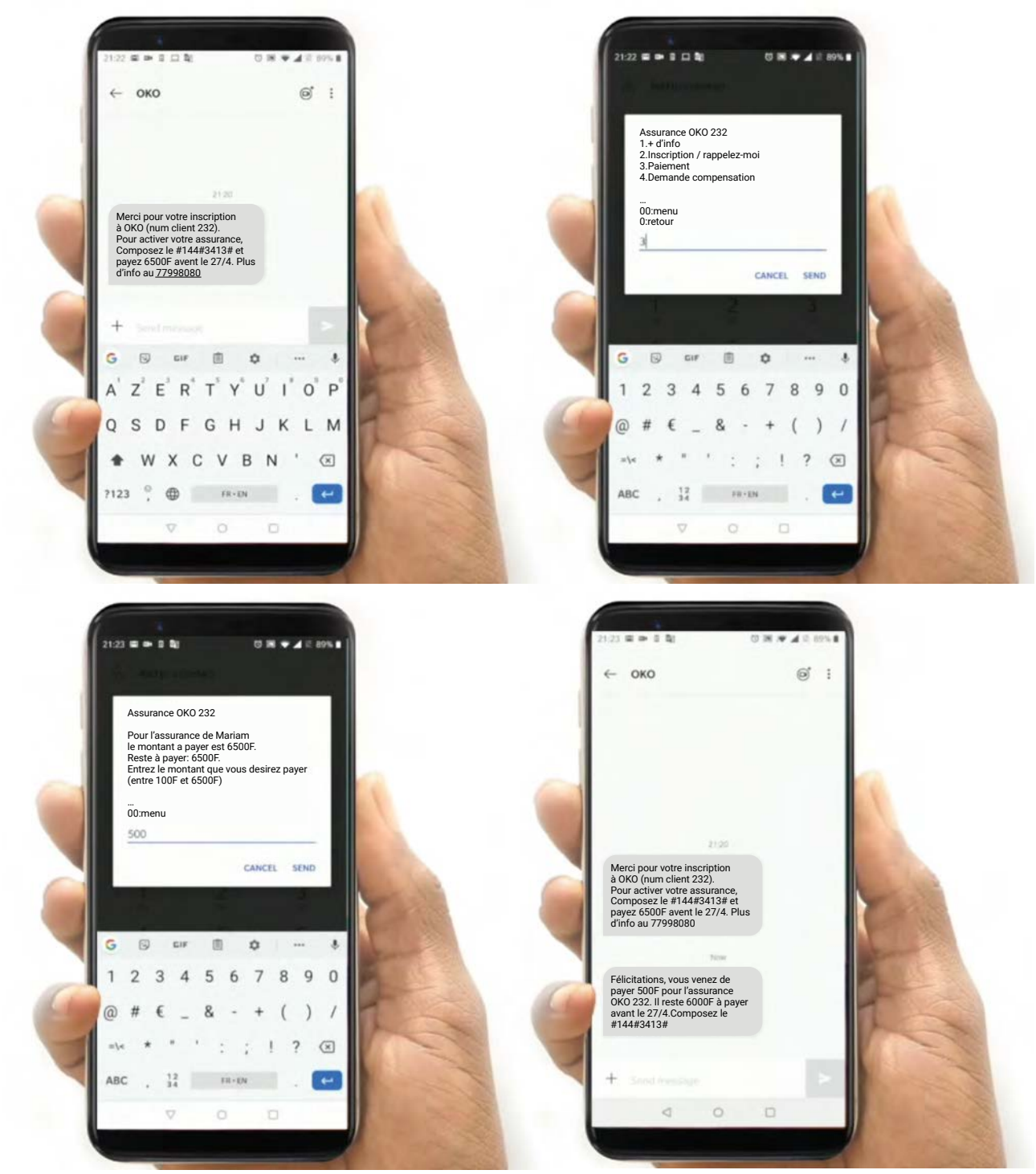
Examples of index insurance providers that use MNO assets for service delivery

	Use case	Examples
Registration	**USSD**	**WorldCover** Ghana, Uganda, Kenya **OKO** Mali
Farm location	**LBS**	**ACRE Africa** Kenya
Regular weather updates	**SMS**	**ACRE Africa** Kenya
Premium and claim payments	**Mobile money**	**Ecosure** Zimbabwe

For example, OKO's insurance service has been integrated in Orange's USSD menu in Mali (see Figure 9), reducing operating costs and greatly expanding the reach of their product. In Kenya, Pula's seed replanting guarantee scheme requires registration via the agent's app after buying a packet of insured seed.

Figure 9

Accessing OKO insurance through Orange Mali's USSD menu



While digitising the registration process for index insurance can help index insurance services scale, the complexity of the services requires significant efforts to sensitise and promote them to customers. As such, awareness campaigns and face-to-face channels will likely remain relevant in the near future. Through its partnership with Orange Mali, OKO has conducted a voice SMS campaign that educates farmers on its insurance service. OKO also involves mobile money agents in its community meetings to ensure customers receive help setting up their accounts and making transactions.

By using mobile money to collect premiums and disburse payouts, index insurance service providers can move away from cooperative or community-based

in-person sales. While mobile money offers lower costs and has less security risk compared to cash-based payments, farmers may still encounter challenges using it. Despite the growth of mobile money, rural customers remain an underserved segment. Agent networks often do not cover most rural areas while rural areas with agents are likely to encounter liquidity management challenges.[31]

In cases where rural agents have sufficient liquidity to offer cash-in and cash-out services, they may add a mark-up to the cost of cashing out, significantly reducing the value of any claims paid out. Farmers subscribed to index insurance services in Zimbabwe face this problem due to hyperinflationary pressures that have led to cash shortages. However, many farmers have embraced mobile money and use it for almost all their financial transactions.

3.4 How MNOs are providing agricultural insurance to farmers

Econet in Zimbabwe and Safaricom in Kenya are examples of MNOs using their assets to offer index insurance to farmers. Both operators use proprietary, in-house platforms to provide services to smallholder farmers. Ecofarmer is Econet's farming services platform. Launched in 2013 as a weather index insurance business unit, Ecofarmer provides farmers with free agronomic advisory, market prices (for maize) and weather forecasts via SMS. It also offers a tractor hire service and has recently launched a crowdfunding platform for the Zimbabwean diaspora to invest in smallholder farming. DigiFarm is Safaricom's centralised, mobile-based hub for smallholder farmers. It provides a range of agricultural services, such as inputs, access to credit, agronomic advisory, access to market and mandatory insurance for farmers taking out loans. Both platforms are well established with over a million registered users each.

Both platforms serve as delivery channels for index insurance as the user data required to offer insurance services is already available on the platform, and trusted communication channels are available to educate users on index insurance and market WII products. Similarly, mobile money services are already integrated in the platforms, which enable registration fees to be collected and insurance claims to be paid out.

While both services use existing assets to deliver WII, each service has adopted a slightly different approach to service creation. Econet uses its own index insurance subsidiary (Econet Insurance) and a partnership with a local underwriter while Safaricom's service is operated by two existing insurance providers, ACRE Africa and Pula, that work together on its DigiFarm platform. In both cases, the insurance services do not use MNO weather data due to the absence of co-located AWS and a lack of active services producing rainfall estimates from the MNO's CML data.

Offering insurance to smallholder farmers as part of a bundle is an opportunity for MNOs and mobile money providers to improve customer loyalty, drive service usage and cross-sell other services. While Econet and Safaricom offer a holistic bundle of digital agricultural services, other MNOs, such as Orange Mali, have allowed standalone index insurance providers to use their platforms without the need for bundling. Bundling is likely in markets with a well-developed mobile ecosystem, where a variety of value-added services are already available. Involving an MNO or mobile money provider increases the possibility of bundling, given their ability to pull together different partner companies under the same brand. In contrast, a variety of standalone services, such as Pula and Mayfair Insurance, offer index insurance through different types of distribution partnerships based on the type of business model they adopt.

31 Gilman, L., et. al. (2015), *Spotlight on Rural Supply: Critical Factors to Create Successful Mobile Money Agents*. GSMA.

4 Overview of index insurance business models

4.1 Current business models in index insurance

Index insurance value chains include traditional and digital players that either share or split core responsibilities (Figure 10).[32] Within these value chains, service providers are typically insurers (usually country-based insurance underwriters), technical service providers[33] (TSPs) and MNOs, each of which uses a particular type of business model to deliver an index insurance service.

Insurer-led

In the insurer-led model, the service is delivered by an insurer, typically an underwriter that also carries out most of the functions in the value chain. Insurer-led models include partners such as aggregators[34] and mobile money providers. TSPs are sometimes included to provide specialist assistance in service design and index trigger monitoring. For example, APA Insurance relies on Pula for actuarial modelling and crop cutting experiments in Kenya. Aggregators are usually involved in targeting potential customers and marketing the service, educating customers and responding to customer queries. For example, Green Delta Insurance sells area-yield insurance through Supreme Seeds, a seed manufacturer in Bangladesh. Premium payments and claim payouts are either carried out by aggregators through cash-based collections or using mobile money where available. Premiums are either paid by the end user (e.g. farmer) or by an intermediary customer (e.g. cooperative, agribusiness or local government), who buys insurance on behalf of a group of farmers.

TSP-led

In this model, the TSP delivers the service and undertakes many of the insurer's responsibilities in the value chain, with the exception of ensuring regulatory compliance and underwriting. TSPs typically lack the insurance licences required to perform these functions. TSP-led services target farmers directly or through distribution partnerships with MNOs, input suppliers, aggregators, microfinance institutions (MFIs) and even non-governmental organisations (NGOs). Both approaches involve premium collection and claim payouts via mobile money. However, some TSPs, such as Pula and Blue Marble, sell insurance to an aggregator which then distributes policies among a group of farmers. In this case, aggregators are also used to pay out claims on behalf of the TSP.

Despite registering growth, most TSPs have not scaled significantly. Distribution remains challenging without an agent network or partnerships, and smallholder farmers' awareness of insurance and the value it offers remains low. However, establishing partnerships with MNOs presents an opportunity for TSPs to scale further.

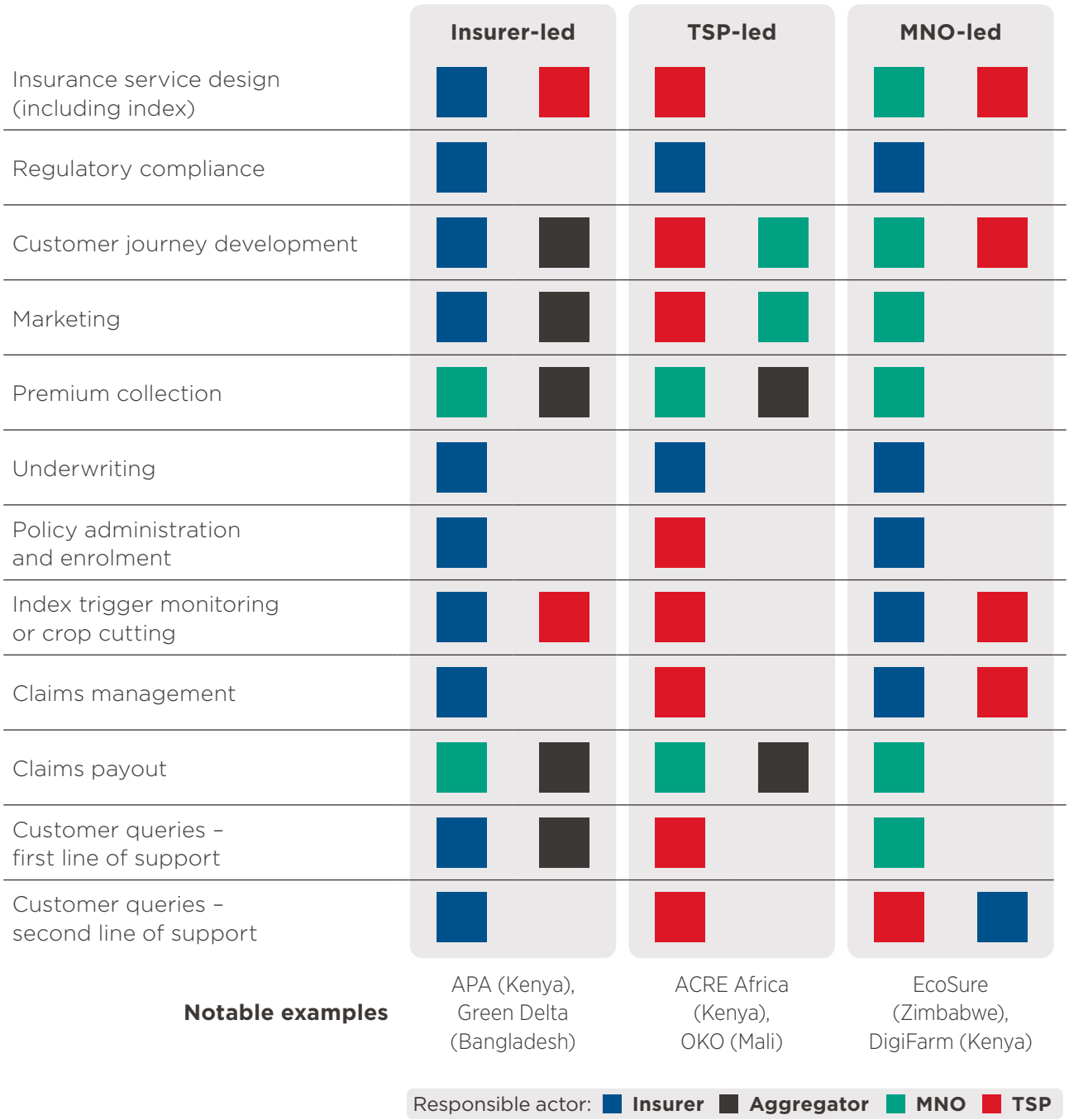
32 Raithatha, R. and Naghavi, N. (2018), *Spotlight on mobile-enabled insurance services*. GSMA.
33 TSPs are specialised companies that provide administrative and technical input for insurance services. While TSPs are sometimes thought of as insurance brokers, their remit along the insurance value chain can be as extensive as an insurer's, with the exception of seeking regulatory compliance and underwriting policies.
34 An aggregator in this case refers to a crop aggregator, such as an agribusiness, cooperative or seed manufacturer.

MNO-led

The MNO-led model is an emerging approach whereby MNOs offer index insurance services to their existing customers under their branding. Under this model, technical functions, such as ensuring regulatory compliance, underwriting, policy administration, index trigger monitoring and claims management, would typically remain the remit of insurers or TSPs. Econet is an exception as its insurance licence and partnership with a local insurer allows it to carry out many of these functions.

Figure 10

Insurance value chain responsibilities by business model[35]



Note: Please see the Appendix for explanations of each of the steps in the insurance value chain.

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DEEP DIVE

How index insurance providers have approached customer education

Farmers' awareness and understanding of insurance remains a key barrier to the uptake of index insurance services. While paying claims is often the best form of marketing and can build a loyal customer base, customer education is important for smallholder farmers to understand how agricultural insurance works and the value it offers them. Most index insurance providers offer customer education through a range of methods.

Providers that offer insurance through a partnership are likely to use a combination of their own agents and their partner's agents to promote the service to customers. Partner organisations will have already built up trust amongst farmers, who are in turn more likely to try out new services recommended to them. Some providers, such as Safaricom, Econet and Pula, use agent-led mass education sessions. However, these large sessions risk leaving farmers with a superficial grasp of the service and limit opportunities to ask additional questions. To overcome this, ACRE Africa, Pula and OKO have started their own call centres to call farmers and supplement their insurance knowledge in local languages.

Agent-led education can be beneficial for insurance providers, but is very expensive to run. In 2011, 40 per cent of ACRE Africa's budget was earmarked for trainers to spend time with farmers.[36] There is an opportunity for mobile technology to lower costs using IVR, outbound dialling (OBD) and SMS. For example, OKO already uses OBD in Mali to educate farmers there.

36 Greatrex, H. et al., (2015), *Scaling up index insurance for smallholder farmers: Recent evidence and insights*.

4.2 The importance of partnerships in scaling the TSP-led model

Partnerships have been key to driving the growth of most index insurance services. Providers have typically collaborated with extension agencies, agro-dealers, seed companies, government agencies and MNOs to promote, market and distribute their services. In many cases, providers have overcome the twin issues of trust and brand recognition by working together with established and trusted organisations in farmer communities. The growth of TSPs, such as ACRE Africa and Pula, stems from their ability to offer affordable index insurance services through partnerships (Figure 11).

ACRE Africa initially offered a seed replanting guarantee service through agro-dealers and seed companies in Kenya that would provide farmers with a replacement bag of seeds if their original seeds failed to germinate. The company has since transitioned to offering weather index insurance to farmers in Kenya directly via mobile, as well as through agents and agro-dealers. The existing partnerships used to sell its initial service remain essential to promoting and selling weather index insurance to farmers and providing customer education on how the service works. ACRE uses Safaricom's M-Pesa service to collect premiums and pay out claims.

Pula offers both a seed replanting guarantee service and an area-yield index insurance service through a business-to-business (B2B) distribution model. Insurance is sold to aggregators which then pass the policies on to farmers who work with them. These policies are either delivered directly to farmers or as part of a bundle of services sold to farmers. The aggregator pays premiums to Pula and collects claim payouts on behalf of farmers. In addition to being sold through aggregators, such as agro-dealers or agribusinesses, Pula sells insurance through government support programmes for farmers. In Kenya, half of the premium charged per farmer for Pula's area-yield index service is subsidised by the government. In Zambia, Pula delivers a hybrid weather index and an area-yield index insurance service through the government's Farmer Input Supply Programme, a nationwide scheme that provides subsidised inputs to around a million farmers a year.

Figure 11

Comparing ACRE Africa and PULA's agricultural insurance services

	ACRE Africa	PULA
Cumulative users*	1.7 million	3.4 million
Countries	Kenya, Tanzania and Rwanda	Kenya, Uganda, Tanzania, Rwanda, Zambia, Malawi, Nigeria, Ethiopia, Senegal and Mali
Types of insurance offered	Weather index insurance Bespoke area-yield index for SME farmers	Weather index insurance Area-yield insurance
Delivery mode	Direct and through partners	Through partners
Major partners	MNOs, agro-dealers, lenders	Governments, agro-dealers, seed companies
Agronomic advisory offered	Yes — based on expected crop life cycle phases	Yes — specific, tailored advisory is provided based on seed purchase date
Weather index data sources	Satellite data and own weather stations	Satellite data

* "Cumulative users" refers to the total number of historical users up to April 2020.

Both TSPs have scaled through a range of partnerships with agro-dealers, MNOs and governments, which also stand to benefit from offering insurance. Agro-dealers can build the trust amongst farmers by selling seeds bundled with a guarantee, while aggregators can use insurance as an incentive to expand their farmer base or to better understand farmers' performance. For instance, Pula offers its customers a dashboard with performance data on farmers, agro-dealers, seeds and areas, giving them a window into farmers' realities.

4.3 The importance of bundling and cross-selling

Besides being bundled with related value-added services, such as agronomic advisory and input loans, many index insurance services have been cross-sold with other types of insurance, such as health or life insurance. This approach provides farmers with comprehensive cover against a range of shocks and allows providers to cross-subsidise their index insurance services and even educate farmers through trusted partners.

MNOs in particular have made bundling and cross-selling central to their index insurance delivery approach. Econet's ZFU EcoFarmer Combo comprises membership of the Zimbabwe Farmers' Union (ZFU), funeral insurance, agronomic advisory and weather index insurance. The service costs $1 per month payable via Econet's mobile money service, EcoCash. Initially offered as a standalone weather index insurance service, the Combo was created to drive uptake and offer a comprehensive bundle of useful services to farmers. The Combo also allows Econet to cross-subsidise the cost of weather index insurance across other services offered in the bundle. As of 2019, around 30,000 farmers were actively using the service.

In DigiFarm's approach, two TSPs with their own services, ACRE Africa and Pula, work together to offer an area-yield insurance service. Both TSPs have similar responsibilities, such as service design and customer journey development. Each TSP also fulfils specific functions, with Pula responsible for crop cutting experiments while ACRE conducts seasonal monitoring. With over one million registered users on the platform, the insurance service has been piloted amongst 42,000 farmers as of February 2020.[37]

With several digital agricultural services available to farmers via DigiFarm, insurance is mandatory for farmers taking out an input loan from the financial services providers on the platform. DigiFarm uses an algorithm based on a farmer's historical yield data, agro-climatic data and historical mobile money use to approve loan applications (Figure 12). When a farmer successfully applies for a loan they are also issued an insurance policy. The policy covers the farmer's yield at the end of a season, which is measured using historical data. While service providers stand to gain access to DigiFarm's million-strong customer base, Safaricom stands to gain additional revenue from providers using its DigiFarm platform.

DEEP DIVE

White-label insurance services can lower barriers to entry for new insurance service providers

Developing WII services requires technical expertise to model and monitor climatic data. Not previously required by underwriters, insurance service providers have either developed this expertise internally or acquired or accessed it through consultancies or technical partners. This is a common approach, with providers like Econet, ACRE Africa, Pula and Blue Marble structuring and running their own insurance services. Acquiring expertise and designing an insurance model can have significant cost implications, especially given the added risk of not recovering these investments if uptake is low or the model is poorly designed.

As index insurance has become widespread, specialised companies have lowered barriers to entry by offering a full package of technical services required to create and run WII services. For example, eLeaf, a Dutch company, provides services that analyse historical weather data to structure WII products, as well as real-time data monitoring to trigger payments. Having deployed WII products in over 20 countries, eLeaf uses its direct connection to the Meteosat satellite and 30 years of data covering Sub-Saharan Africa for the majority of its services. Such specialisation has allowed eLeaf and other companies, such as Guy Carpenter and CelsiusPro, to offer cost-effective, white-label WII products to underwriters, mobile operators and other providers of agricultural insurance.

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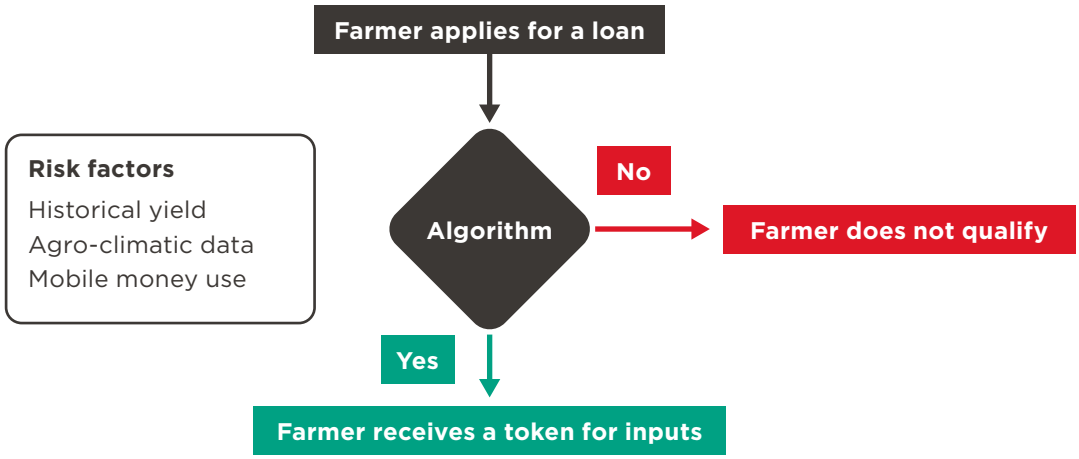
Figure 12

DigiFarm loan application process and insurance pay-out formula

Loan application process



Claim payout formula

Input cost (expected yield: 1 tonne per acre)	KES 10,000
Price of crops	KES 20,000
Profit	KES 10,000

If drought or damage occur, farmer gets 67–90% of expected yield.

In this case, assuming 80%, farmer receives KES 16,000.

KES 10,000 covers inputs, while the farmer receives KES 6,000 via mobile money.

Both Econet and Safaricom already had a large customer base and reputation for their digital agricultural services. Customer trust in both MNOs was apparent through increased uptake and a willingness to pay for their services. This enabled both companies to layer index insurance onto their existing digital agricultural services. This approach shows that an existing digital agricultural offering allows providers to gradually test and launch new and more complex services for smallholder farmers.

4.4 The commercialisation challenge and new pathways to sustainability

Despite a modest growth in index insurance services, few have become commercially viable. Although more affordable than indemnity-based services, the premiums charged by many services are still beyond the means of most smallholder farmers. A key cost driver is the high risk that underwriters associate with agriculture, while administrative costs related to distribution and registration also impede commercial sustainability. One approach to reducing the burden on farmers when selling index insurance through the business-to-customers (B2C) channel, is allowing them to make micro-payments towards their WII. Farmers can expand their level of cover depending on their available funds. ACRE Africa has adopted this approach in Kenya where most rural residents buy goods based on their immediate needs and budget.

Implementing a business-to-government (B2G) model through government partnerships that support subsidised premiums is another pathway to sustainability. For example, Mayfair Insurance in Zambia works with the government's Farmer Inputs Support Programme, which subsidises inputs. Similarly, Hollard Insurance in Mozambique offers insurance with 40 per cent of the premium covered by the World Bank.

Government support has helped to include farmers for whom insurance would have otherwise been unaffordable, reduce farmers' risk exposure and scale up demand for index insurance. However, government support can often be short-lived, leaving newly insured farmers no better off than they were without insurance. For index insurance providers, working with government programmes can be time-consuming and requires an understanding of shifting government priorities. Index insurance providers will need to engage continuously with government and build internal capacity to foster partnerships.[38]

Forming business-to-business (B2B) partnerships is another sustainable way to deliver index insurance services at scale. Partnerships with agribusinesses can significantly reduce the cost of registering and locating farmers. Agribusinesses that digitise financial transactions through mobile money can also benefit insurance providers, as this increases the likelihood of digitising premium payments and claim payouts.

For example, with the support of the GSMA AgriTech Programme, MTN Mobile Money Ghana developed mAgric, a mobile-based tool that digitises the entire procurement process in the agricultural last mile.[39] mAgric supports farmer registration and mobile money payments from agribusinesses to farmers, as well as providing data analytics and monitoring for agribusinesses. Index insurance service providers can sell index insurance as an additional layer through platforms that integrate farmers in formal value chains, digitise transactions and collect data on farmers' transactions.

An alternative B2B approach involves partnerships with agribusinesses that pre-finance insurance premiums for farmer inputs. For example, Green Delta Insurance in Bangladesh provides index insurance services to agribusinesses that subsidise the cost of insurance for farmers in their value chains, deducting premiums from the proceeds of crop sales at the end of a season. Agribusinesses that pre-finance inputs for farmers would benefit from insurance service providers offering their farmers index insurance. This approach would limit the outlay an agribusiness would incur for inputs and for subsidising insurance policies, and offer collateral against the cost of inputs.

38 Hazell, P. et al., (2017), *When and How Should Agricultural Insurance be Subsidized? Issue and Good Practices. Global Index Insurance Facility*.
39 GSMA (2019), *Digitising the agricultural last mile in Ghana: MTN Mobile Money's mAgric*.

5 Lessons and recommendations

The digitisation of index insurance services has overcome some of the challenges of indemnity-based services and enabled many smallholder farmers to access insurance for the first time. However, uptake remains limited.

Index insurance services have been piloted worldwide, with some pilots successfully transitioning into fully fledged services. Without a need for farm-level loss assessments, index insurance have reached many previously uninsured smallholder farmers. Index insurance services providers have scaled their services further by digitising elements of service creation and delivery. For example, satellite data and co-located AWS have resulted in better coverage of near real-time weather data and generated more precise claim settlements. Despite these improvements, distribution and customer education remain a barrier to uptake by farmers.

Partnerships are vital for index insurance services to scale further and to improve customer education.

Index insurance providers have benefited from partnerships with organisations trusted by farmers to sell their services. Both ACRE Africa and Pula offer their index insurance services through agro-dealers that farmers already trust and which play a vital role in educating farmers about the value of insurance and how these services work. Similarly, Econet relies on existing ZFU field agents in farming communities to promote and register farmers for its bundle of services. Collaborating with trusted and recognised organisations to distribute their services has enabled index insurance providers to raise awareness of their services and expand their customer base.

Mobile technology adds value to the index insurance value chain by enabling, contextualising and delivering services. Alongside the well-understood benefits of using mobile channels for service delivery, data from mobile networks can complement satellite data to overcome the challenge of data scarcity.

Low availability of historical and current data is a challenge for most index insurance services. Data from automated weather stations co-located with MNO base stations and CML data from mobile networks can complement data from satellites and weather stations to provide a clearer picture of the ground truth. This data can also lead to more accurate indices and triggers, and therefore accurate claim payouts to farmers in affected areas. Data-sharing partnerships between index insurance providers, MNOs and other companies with ground-level weather data can bridge the data gap in developing countries. Partnerships with MNOs have the potential to go beyond improving service creation and delivery; index insurance providers can also obtain user locations through triangulation via LBS.

There is a significant opportunity for MNOs to use their brand strength to drive the growth of index insurance services. MNOs that already provide agricultural value-added services are well placed to offer index insurance to farmers as part of a holistic bundle of content and financial services.

Index insurance service providers are using mobile technology to register new users, provide updates, collect premiums and pay out claims via mobile money. In addition, MNOs can drive uptake by including index insurance services as part of their value proposition to

farmers and rural dwellers. The examples of Econet in Zimbabwe and Safaricom in Kenya show that farmers are likely to trust and use services offered by MNOs, especially those with a well-recognised brand and history of offering other digital agricultural services. However, brand recognition is not limited to MNOs with digital agricultural services. OKO's partnership with Orange Mali shows that an MNO can rely on brand strength to provide well-designed index insurance services to rural customers.

Bundling index insurance with other agricultural value-added services, such as input loans, is likely to increase uptake. Farmers applying for input loans through Safaricom's DigiFarm platform have been required to take out a mandatory area-yield index insurance policy. This offers farmers a safety net against crop losses and collateral for the loans, with farmers receiving between 67 per cent and 90 per cent of the value of their expected yield. From an initial pilot that saw 19,000 farmers register, the service was extended to 42,000 as of February 2020.

Cross-selling index insurance with non-agricultural value-added services can also increase customer uptake. Econet's ZFU EcoFarmer Combo service has proved attractive to farmers because of the funeral insurance and agronomic advisory offered. Having previously sold weather index insurance on its own, Econet decided to offer a bundle of services after realising the weather index insurance was too complex to sell as a standalone service. Although growth has been affected by the economic situation in Zimbabwe, the service has seen higher uptake than the initial weather index insurance service.

Of the different approaches to commercial sustainability, B2G remains important due to the role played by government programmes. Several providers offer B2C services, while B2B2C models through partnerships with value chain actors offer greater potential for sustainability.

Early index insurance services struggled to grow as farmers were unable to afford the premiums. Current index insurance service providers, such as Pula, ACRE Africa, Mayfair Insurance and Hollard Insurance, all offer services with premiums subsidised by government programmes. This has increased the number of farmers who can access affordable agricultural insurance. While B2G partnerships have proved effective at scaling insurance services, government support can be short-term and challenging to work with.

Some providers have adopted a range of B2C and B2B approaches to achieve commercial sustainability. For example, ACRE Africa's Bima Pima (B2C) service allows customers to pay what they can, which determines the level of cover they receive. Pula and Green Delta Insurance have partnered with agribusinesses that buy index insurance policies on behalf of the farmers they work with and deduct premiums from farmers' seasonal crop sales. Most providers have adopted a B2B2C-type approach that involves partnerships with agribusinesses or other organisations trusted by farmers to distribute their index insurance services widely.

Bundling agricultural insurance with loans is a viable strategy to enable farmer financial inclusion because insurance serves both as a form of loan protection and income safety net.

Insurance can help unlock agricultural credit as it serves as collateral for loans and eases the process of assessing the creditworthiness of farmers. For example, DigiFarm offers compulsory area-yield index insurance to farmers who successfully apply for a loan through its platform. Green Delta Insurance in Bangladesh also offers a similar service for livestock loans taken out through Brac Bank. While most smallholder farmers may need credit for inputs or livestock, few may realise the benefit of buying an insurance policy alongside them to protect against defaulting on the loans. Any events that affect their yield and livestock would expose them to the double blow of income loss and loan default. This can be avoided to some extent through customer education on how insurance works and the value it offers.

Bundling insurance with loans can also benefit the insurance service provider and the lending institution. Index insurance service providers are likely to see higher uptake if their services are bundled with loans given that standalone services have often struggled to grow. Lending institutions face lower risks providing loans with an insurance service. Evidence from early pilots of index insurance bundled with credit show that lending institutions can recover more loans from insured farmers, potentially allowing them to offer lower interest rates on loans bundled with insurance.[40]

40 Mukherjee, P., Pandey, M. and Prashad, P. (2017), *Bundling to make agriculture insurance work*.

Appendix

Explaining the value chain categories

Definitions for the responsibilities outlined in the value-chain model shown in Chapter 4 are listed below.

Responsibility	Explanation
Insurance product design (including index)	Identifying insurable risks, determining key product features, determining pricing based on actuarial analysis and designing the index based on historical data.
Regulatory compliance	Ensuring alignment with regulatory requirements set by the local regulator.
Customer journey development	Defining the target group, devising the customer value proposition and customer sign-up process, and establishing payment capabilities.
Marketing	Branding the product, developing content for campaigns, taking the product to market and developing relationships with premium collectors and enrolment partners.
Premium collection	Collecting product fees (for premium and freemium policies).
Underwriting	Assuming liability for insured risks.
Policy administration and enrolment	Managing all aspects of insurance policies issued, including signing up and onboarding customers, policy rating, policy issuance and billing.
Index trigger monitoring or crop cutting	Monitoring the threshold that needs to be met or breached, or carrying out crop cutting experiments to determine yield thresholds for payouts.
Claims management process	Registering claim notification, checking cover, determining liability, determining claim payout amounts and arranging for claim payouts.
Claims payout	Mechanism by which claims money is paid out to beneficiaries (usually using mobile money, cheques or cash).
Customer queries	Managing customer queries at two levels: responding to basic product queries (first line of support) and responding to complex policy-related questions (second line of support). These can be done through field-based agents or call centres.

Selected digital agricultural insurance providers by country

Region	Country	Provider
Asia	**Bangladesh**	Green Delta Insurance
	India	Ibisa Network
		ICICI Lombard
		IFFCO-Tokio
		Ministry of Agriculture & Farmers' Welfare
		PULA
		Tata-AIG Insurance
	Philippines	CARD Pioneer
		PCIC
	Sri Lanka	Oxfam
		Sanasa
Sub-Saharan Africa	**Burkina Faso**	Inclusive Guarantee
	Cote d'Ivoire	Inclusive Guarantee
	Ethiopia	ILRI
	Ghana	Ghana Agricultural Insurance Pool (GAIP)
		WorldCover
	Kenya	ACRE Africa
		APA Insurance
		DigiFarm
		Kenya Livestock Insurance Programme
		PULA
		WorldCover
	Malawi	PULA
	Mali	Inclusive Guarantee
		OKO
	Mozambique	Hollard Insurance
	Niger	Ibisa Network
	Nigeria	PULA
	Rwanda	ACRE Africa
		PULA
	Senegal	Inclusive Guarantee
	South Africa	Mobbisurance
		CelsiusPro
	Tanzania	ACRE Africa
		PULA
	Uganda	M-OMulimisa
		PULA
		WorldCover
	Zambia	Mayfair Insurance
		PULA
	Zimbabwe	Blue Marble Microinsurance
		Econet Wireless

GSMA Head Office
Floor 2
The Walbrook Building
25 Walbrook
London EC4N 8AF
United Kingdom
Tel: +44 (0)20 7356 0600
Fax: +44 (0)20 7356 0601