



International  
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# ► An impact insurance solution to build smallholder farmers' resilience

How to design and assess the performance of the solution

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## ► 1. Introduction

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### 1.1 The landscape of inclusive insurance for smallholder farmers

Recently, the world has experienced devastating natural disasters such as floods, droughts and extreme heat. According to a new climate update published by the [World Meteorological Organization \(2021\)](#) (WMO), the average global temperature is likely to temporarily reach 1.5° C above pre-industrial levels in at least one of the next five years. That is, earlier than expected. Moreover, a recent study has found that 30 per cent of the world's population currently suffers deadly heat temperatures for at least 20 days per year and this number is expected to rise to approximately 50 per cent by the year 2100 ([Mora, et al., 2017](#)). Similarly, health risks such as pandemics have proven to be a great threat for humankind. For instance, [The World Bank \(2021\)](#) estimates the COVID-19 pandemic has led to 97 million more people into poverty, an unprecedented increase in global poverty.

Despite the need of investing more in resilience building, a financing gap for adaptation and disaster risk reduction remains wide. From the inclusive insurance perspective, according to the *Landscape of Microinsurance*, a study performed by the [Microinsurance Network \(2021\)](#) (MiN), just between 6 and 14 per cent of the potential market for inclusive insurance, largely made up of low-income individuals, is currently covered, meaning that there is still a huge gap to be closed. This is mainly due to the fact that this particular segment of the population is characterised by being difficult to reach and inclusive insurance providers have lack of access to them.

In this context, the main purpose of this article is to introduce an integral impact insurance solution consisting of an insurance protection and a savings account for smallholder farmers<sup>1</sup> that will provide them with coverage particularly against climate change and health risks, since this particular sector is in need of receiving support from international programmes such as the ILO's Social Finance Programme, as they are one of the most vulnerable communities against these types of risks. Smallholder farmers are prone to suffer adverse events due to their limited resources and reduced access to both technical and financial support. Everyday perils range from an individual health emergency to a widespread crop loss, being both aggravated considerably by catastrophic events such as pandemics and natural disasters (mainly driven by climate change), respectively.

The development of the smallholder farmers' sector represents a great resource for humanity. According to [Lowder, et al. \(2021\)](#), the world's smallholder farmers produce around one third of the world's food, revealing the importance of this sector for human development. On the other hand, the sector's current status exposes the need of resilience building, particularly, in the form of insurance, for this particular group. For example, [ISF Advisors \(2018\)](#), an advisory team that combines research strategy advisory and deep financial and investment banking expertise to develop financial solutions for the rural enterprise market, recently published the report *Protecting Growing Prosperity: Agricultural Insurance in the Developing World*, from which among many other findings we can highlight the following:

- 20 per cent of smallholder farmers currently have agricultural insurance;
- ~270 million smallholder farmers in developing countries require between US\$60 and 80 billion in agricultural insured value coverage, and
- the coverage gap is highly driven by both a low demand for and a low supply of agricultural insurance in developing countries.

In accordance with these findings, we could presume that smallholder farmers lack of insurance awareness and access.

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<sup>1</sup> A smallholder farmer is a farmer operating under a small-scale agricultural model.

## 1.2 Gender sensitiveness in inclusive insurance

The absence of insurance awareness and access is more prevalent among female smallholder farmers (see, for example [Delavallade, et al. \(2015\)](#), where the authors state female smallholder farmers appear to participate less than their male counterparts in index-insurance programmes – a type of agricultural insurance that pays out benefits on the basis of a predetermined index, such as rainfall, temperature, humidity or crop yields, rather than paying indemnities for actual losses – in Africa). There are many potential causes that discourage agriculture insurance demand among women. Firstly, male smallholder farmers are more concerned about risks affecting their agriculture production whereas female usually worry more about other types of risks, such as the well-being of their families (health risks) ([Delavallade, et al., 2015](#)), clearly showing men and women perceive risk in different ways ([Msangi, 2017](#)). As a consequence, male and female smallholder farmers have different preferences towards risk management strategies. For example, male smallholder farmers prefer investing their money on buying index-insurance while female ones are more in favour of using alternative strategies such as savings ([Delavallade, et al., 2015](#)). Secondly, the levels of financial literacy among smallholder farmers and the degrees of trust associated with institutions that commonly assume the role of insurance providers could also be categorized by gender ([Akter, et al., 2015](#)). For instance, compared to men, smaller proportions of women tend to have higher education, while larger portions of female smallholder farmers are more likely to be unfamiliar with the concept of insurance ([Akter, et al., 2015](#)). Moreover, women have shown to prefer government banks as insurance providers ([Akter, et al., 2015](#)). Finally, for the particular case of index-insurance, researchers have found that these products may be gendered in their crop choice. That is, index-insurance products tend to focus on one or two primary crops usually grown in an area, thus reducing gender-inclusiveness since the chosen crops may be only (or more often) grown by men or women (see for example [Greatrex, et al. \(2017\)](#), which highlights the fact that groundnuts in Ghana are shown to be more often grown by women). All these causes suggest gender needs to be integrated into the design process of risk management strategies to ensure both men and women are benefited by enrolling into an insurance programme ([Born, et al., 2019](#)). Involving both male and female smallholder farmers in insurance product design could represent a key factor for reaching scale. In addition, gender-sensitive consultative methods and gender indicators can also help to reach this objective.

## 1.3 Technology-driven index and health inclusive insurance solutions

As in many industries, technology has been a game changer throughout the inclusive insurance value chain. Particularly, in the agricultural insurance landscape, advances in technology breakthroughs have facilitated the emergence of new insurance products such as index-insurance, making the product more affordable for smallholder farmers since, for example, claims settlement processes turn out to be quicker and more objective. The low purchasing power of smallholder farmers together with the high transaction costs mainly due to, among other reasons, the assessment of the losses suffered by the insured that characterize traditional-based insurance systems, empower the idea that innovative forms of insurance such as index-insurance are therefore more feasible for this sector of the population ([Hansen, et al., 2017](#); [Yuzva, et al., 2018](#)). The reduction of moral hazard and adverse selection is also another feature that characterizes index-insurance programmes. Moral hazard occurs, for example, when smallholder farmers falsify losses ([Peterson, 2012](#)), while adverse selection takes place when smallholder farmers own hidden information about their risk exposure that the insurance company does not possess, hence resulting in an imprecise assessment of the risk by the company ([Carter, et al., 2014](#)) which can lead to higher premiums and pay-outs, therefore threatening the programme's sustainability. There exist two main types of index-insurance: (1) weather-based and (2) area yield indices ([Born, et al., 2019](#)). Weather-based index-insurance programmes typically track a meteorological index that indicates when there are particularly bad yields ([Binswanger-Mkhize, 2012](#); [Leblois & Quirion, 2013](#); [Carter, et al., 2014](#)). Certainly, these meteorological indices must be highly correlated to the agricultural production within the region, easily measurable, publicly verifiable and not subject to manipulations ([Carter, et al., 2014](#)). On the other hand, area yield indices are based on historical average yield losses over a specific region and are commonly crop-specific ([Wang, et al., 2013](#); [Tadesse, et al., 2015](#)). To the present day, weather-based indices have been more popular among developing countries, since they rely on weather records which tend to be more available than historic yield losses ([Wang, et al., 2013](#)). All these features have led to an unprecedented increase on the up-take of index-insurance. Some examples of index-insurance programmes in developing countries include the Pradhan Mantri Fasal Bima Yojana (PMFBY), which was launched

in 2016 to replace the existing National Agriculture Insurance Scheme (NAIS) and is considered as the largest crop insurance in the world, with about 20 million farmers being insured every year in India ([Mahul & Stutley, 2010](#)), and the Nigerian Agricultural Insurance Scheme, created in 1987 to provide agricultural risks insurance coverage to Nigerian farmers through the government-owned Nigerian Agricultural Insurance Corporation (NAIC) ([Akinrinola & Okunola, 2014](#)). Even though index-insurance has shown promising effects as a risk management tool against climate change risks, there are still many challenges this type of insurance needs to overcome. For instance, basis risk (this type of risk refers to the fact that, under an index-insurance policy, farmers might experience a loss but not receive compensation, or they might receive a pay-out despite not experiencing a loss ([Msangi, 2017](#))), data management and communication with clients ([Food and Agriculture Organization \(FAO\), 2014](#)) are among these obstacles. In the particular case of basis risk, some researchers suggest it can be mitigated by attaching other types of risk management strategies, such as savings, other type of insurance or credit arrangements, to the index-insurance policy ([Clarke, et al., 2015](#)). Besides, researchers have found that, in general, smallholder farmers are more open to test index-insurance products when they are offered as part of a portfolio of risk management strategies ([Hellmuth, et al., 2009](#)). For example, the Agriculture and Climate Risk Enterprise (ACRE), a Kenya-based service provider established in 2009 that evolved from the Kilimo Salama project and is funded by the Syngenta Foundation and the Global Index Insurance Facility (GIIF), has been offering index-insurance linked to agricultural credit provided by microfinance institutions ([Greatrex, et al., 2015](#)). Cumulatively, by 2018, approximately 1,700,000 smallholder farmers in Kenya, Rwanda and Tanzania were insured by products designed by ACRE ([CTA, 2019](#)).

In like manner, the emergence of digital healthcare platforms has simplified the access to healthcare through technology by enabling tele-medicine consultations, medication support and health management strategies, among many other features. For example, BIMA MILVIK, a Swedish Fintech for Health that was founded in 2010, has been providing healthcare and insurance access to about 10 million people across 10 markets in South Asia, Southeast Asia and Africa. In 2021, the company performed 74 million positive health interventions ([BIMA MILVIK, 2022](#)). Apart from offering access to qualified doctors and enhanced health services at a touch of a button, BIMA MILVIK also provides, through a mobile phone application, Value Added Services (VAS) that allow customers to manage their health needs in the form of weekly messages that contain information about health topics of interest, such as diabetes or women's health ([BIMA MILVIK, 2022](#)). The partnership established between GOJEK, an Indonesian start-up established in 2010 that specializes in ride-hailing and logistics ([GOJEK, 2022](#)); Halodoc, a leading Indonesian healthcare platform whose main goal is to simplify access to healthcare through technology ([Halodoc, 2022](#)); and Allianz, the life and health-insurance leader in Indonesia ([Allianz, 2022](#)); is another example of the great benefits that a technology-enabled health-insurance product can provide to its clients. The alliance offers a group medical indemnity insurance product to GOJEK drivers which covers both inpatient and outpatient care. Digital healthcare, which is boosted by Halodoc, is one of the main features of the product. In addition, the product is powered by a digital platform in which customers can register for the product, submit claims and pay premiums ([Munich Re Foundation, 2022](#)). Notably, tele-health services take on greater importance during pandemics such as the COVID-19 outbreak. In times in which government directives on social distancing and staying at home must be followed by the population, tele-medicine that includes, among many other services, diagnosis and disease treatment provided by qualified doctors, plays an important role to contain the spread of the disease. Specifically, Britam, a leading financial services group with presence in Kenya, Malawi, Mozambique, Rwanda, South Sudan, Tanzania and Uganda ([Britam, 2022](#)), together with Strathmore University ([Strathmore University, 2022](#)), launched Britam Afya Mikononi during the COVID-19 pandemic, an insurance product that offers remote healthcare services ([Strathmore University, 2020](#); [Britam, 2020](#)).

## 1.4 Bundling inclusive insurance with savings to create financial resilience

Bundling inclusive insurance products with other financial products could bring many benefits for both the insurer and the insured. As mentioned previously, the proposed impact insurance solution (which provides protection against climate change and health risks) also contains a savings component which can help smallholder farmers to build a financial base that can serve for multiple purposes. Savings provide a buffer against short-term needs, therefore increasing smallholder farmers ability to cope with shocks. Besides, saving for different purposes, including agricultural investment, insurance premium payment and for risk management supports participants' graduation and builds their resilience against climate and other shocks ([World Food Programme \(WFP\), 2020](#)). For example, MicroEnsure in Ghana experienced an increase in penetration and a stimulation of, insurance and savings,

respectively, when bundling together both products (Matul, et al., 2013). There exist several examples of agricultural insurance programmes that are bundled with a savings component in developing countries, being the R4 Rural Resilience Initiative probably the most known among them. As of 2020, R4 benefited approximately 900,000 people in Bangladesh, Burkina Faso, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Senegal, Zambia and Zimbabwe. R4 puts in the same basket four risk management strategies: (1) improved natural resource management through asset creation or improved agricultural practices (risk reduction) (2) inclusive insurance (risk transfer) (3) increased investment, livelihoods diversification and microcredit (prudent risk taking) and (4) savings (risk retention) (World Food Programme (WFP), 2020). Correspondingly, bundling health inclusive insurance with savings has also been suggested by practitioners. People working in health inclusive insurance state that a combination of health inclusive insurance and savings can help low-income individuals cope with inpatient and outpatient healthcare expenses by relaxing liquidity constraints and helping households accumulate funds for out-of-pocket expenses (Holtz, et al., 2014). Some examples of health inclusive insurance products that are bundled with a savings component include Changamka's Maternity Savings Card in Kenya, which is a product that enables transactions and provides a savings account (Woodman, et al., 2013) and the New Cooperative Medical Scheme for Rural Residents in China, a risk management strategy that combines medical savings and health-insurance (Ma, et al., 2012). Both programmes have been very popular and have helped low-income individuals cope with medical expenses.

## 1.5 Public-private partnerships as key components on the development of inclusive insurance solutions

Experience has shown that successful inclusive insurance programmes are characterized by strong coordination and partnerships between governments, private insurers, donor agencies, non-governmental organizations (NGOs) and other external stakeholders from the private sector. Therefore, these institutions play a key role in the risk management solution proposed in this paper. In particular, governments play a crucial role since, for example, in some countries like China and India, thanks to the support (and premium subsidies) provided by central and provincial governments, the agricultural insurance sector has shown to grow dramatically (Mahul & Stutley, 2010). Another great example of success that results from efficient public-private partnerships (PPPs) is the Ugandan Agriculture Insurance Scheme, an agricultural insurance product launched as a five-year pilot in 2016 that was recently extended until (at least) 2024 due to the increasing uptake and accomplishments reached throughout the years. In particular, this country-wide scheme provides premium subsidies to farmers of 30 per cent, 50 per cent and 80 per cent, depending on whether they are large-scale, small-scale farmers or if they are in disaster-prone areas, respectively (Erena, et al., 2019). By building successful PPPs with the appropriate stakeholders, the ILO's Social Finance Programme can help insurance providers to create affordable and adequate products for the people.

## 1.6 What is the role of the ILO's Social Finance Programme?

The ILO's Social Finance Programme needs to understand and leverage from past experiences of impact insurance products as the ones mentioned previously. Moreover, the programme needs to understand the strong and weak points of, employing digital developments throughout the inclusive insurance value chain and bundling insurance with other financial products. Most of past experiences have shown that the adoption of technological breakthroughs will lead to the formulation of more suitable insurance products for the most vulnerable. However, some practitioners think that limiting human interaction might lead to low awareness and a lack of understanding and trust among customers (Munich Re Foundation, 2022). Therefore, finding the right balance between digitalisation and human engagement is essential to generate sustainable inclusive insurance programmes. Similarly, bundling needs to be designed with caution such that the products offered in the basket complement each other. Lastly, measures to ensure that both male and female clients benefit from impact insurance should also be taken by the programme. To explore the extent to which an impact insurance solution benefits women and men, the ILO's Social Finance Programme could follow the approach proposed by Johnson, et al. (2018), which focuses in three main aspects: (1) including women as participants in the impact insurance program activities and tracking their progress over time (reach), (2) ensuring that the design, implementation and evaluation of the impact insurance solution should be captured and valued by both men and women, while also assuring that the solution does not harm either of them (benefit) and (3) analysing how the solution entails strengthening the ability of women

to make strategic choices — including financial decisions, expenditures and investments — in a context where this was previously denied (empowering).

## ► 2. An impact insurance solution for smallholder farmers' resilience building

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In this section, we provide an overview of the proposed impact insurance solution for smallholder farmers. In particular, Figure 1 briefly presents the major components of the impact insurance solution, which is mainly boosted by advances in technology and the establishment of convenient PPPs. Each arrow represents a link between two actors. A small description for each of these links is presented throughout this section.

1. The impact insurance solution will potentially follow an insurer, technical service provider or mobile network operator (MNO)-led model (for a brief overview of the current business models in index-insurance, see, for example, [Priebe & Raithatha \(2020\)](#)). Smallholder farmers pay premiums to the insurance company. This could be done in the traditional approach where smallholder farmers directly transfer the money to the insurance provider (by physically attending one of the offices or by just transferring it through a bank account). However, due to the fact that most of these farmers are based in remote areas and are unlikely to have access to financial services such as personal bank accounts, we might therefore be on the need of leveraging mobile technology breakthroughs. For example, premium payments could be executed by using Unstructured Supplementary Service Data (USSD), mobile money or WhatsApp Pay. This technology-driven approach would remarkably facilitate reaching the customers and will also reduce the costs associated with the premium collection process. Besides, using technology could also enhance women's insurance take-up since, for example, in some developing countries, previous studies have found that women use slightly more mobile phones than men (see, for example [Porter, et al. \(2012\)](#), where women in South Africa seem to use slightly more mobile phones compared to men). As an example of the use of WhatsApp in the inclusive insurance value chain, we could consider the case of SBI General Insurance. Recently, the company started using the application to issue insurance policies and, according to them, some of the advantages of using this mobile phone application is leveraging the fact that about 340 million people utilize WhatsApp in India, its user-friendly platform, the digital payment system and the support of different regional languages ([Munich Re Foundation, 2022](#)). Aggregators<sup>2</sup> and MNOs can also be involved in the premium collection process ([Priebe & Raithatha, 2020](#)).
2. The insurance company provides protection to the smallholder farmer in exchange for regular premium payments proportionate to the likelihood and costs of the risks involved: agricultural and health. Here, technology can also play an important role. First, indemnity payments could be performed through USSD, mobile money or WhatsApp. For instance, ACRE uses M-Pesa, a mobile money platform, and SMS technology, to settle claims and send a confirmation message of the pay-out, respectively ([Prashad, Saunders, & Dalal, 2013](#)). Moreover, previous research suggests that using mobile phones to provide insurance pay-outs apart from increasing efficiency and decreasing transaction costs ([Cole, 2015](#)), can also help increasing scaling out index-insurance ([Murray, 2015](#)). Second, the insurance company apart from providing protection against the aforementioned risks, might also be interested in providing VAS to the customers. Note that, although not shown in Figure 1, VAS can also be provided by other service providers (third parties). VAS could be delivered through SMS or WhatsApp and they could, for example, from the health side, include nutritional assistance to promote a healthy lifestyle and psychological counselling. Moreover, preventive and therapeutic VAS such as health education and in person-consultation, respectively, can be provided (for a comprehensive list of examples of VAS in health inclusive insurance products see, for example, [Pott & Holtz \(2013\)](#) and [Morgan & Churchill \(2018\)](#)). On the other hand, from the agricultural side, recommendations for growing a healthy crop could also be disseminated. These services provide more frequent "benefits", making the impact insurance solution more tangible for clients. In addition, they improve clients' risk management practices, thereby reducing risk for the insurance provider ([Prashad, Saunders, & Dalal, 2013](#)). Weather Risk Management Services Ltd. (WRMS), a climate risk management company that protects farmers against agricultural risks in India, offers, for example, several VAS including weather forecasts and alerts, crop market prices and updates on claim-related data ([Prashad, Saunders, & Dalal, 2013](#)).

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<sup>2</sup> An aggregator refers to a crop aggregator, such as an agribusiness, cooperative or seed manufacturer. Aggregators' duties usually include targeting potential clients, advertising the insurance product, educating customers and answering customer queries ([Priebe & Raithatha, 2020](#)).

3. Donor agencies can effectively support inclusive insurance programmes by funding the impact insurance solution. For example, despite not being fully recommended, donor agencies can subsidy insurance premiums ([Churchill & Matul, 2006](#)). These organizations can also participate in the design and management of the impact insurance solution. Building strong relationships with donors is key for the creation of sustainable insurance products.
4. NGOs<sup>3</sup> play an important role on the implementation of the impact insurance solution. These organizations can act as distribution channels and provide a platform for communication and training ([Churchill & Matul, 2006](#)).
5. In recent years, the public sector has played a key role in the development of agriculture insurance, with significant amounts of public money spent (mainly in the form of subsidies) in many developing countries (more than US\$11 billion a year in total, according to [Hazell, et al. \(2021\)](#)). Similar to point 3 above, governments can effectively support inclusive insurance programmes by providing smallholder farmers with insurance subsidies. If the subsidy is designed properly, subsidized inclusive insurance products can be a powerful and cost-effective way to achieve public policy objectives (see [Hazell, et al. \(2017\)](#) for a detailed analysis on agricultural insurance subsidies; [Carter & Janzen \(2018\)](#), [Flores-Contró, et al. \(2021\)](#), [Janzen, et al. \(2021\)](#) and references therein for a study on the impact of government subsidies over the cost of social protection).
6. The index provider will design and calculate the indices for the index-insurance portion of the solution (weather-based index). These could be satellite-based indices for droughts and extreme precipitation, among others. Moreover, high technological developments such as artificial intelligence could empower the reliability of this type of insurance.
7. The index provider<sup>4</sup> will receive a portion of the premium paid by the smallholder farmers and the premium subsidies provided by donor agencies and governments in exchange of the provision of its services, which generally include, among many others, the analysis of historical weather data to structure index-insurance products.
8. The impact insurance solution would also include a savings component. That is, a type of endowment policy in which a savings account will be created and from which each smallholder farmer will obtain a lump sum payment at maturity, meaning after a specific term. Furthermore, the pay-out (without penalty) would also be done before the date of maturity just in special situations in which the smallholder farmer is facing hard times or wants to, for example, invest its savings in other projects such as the financing of its children's education. Moreover, smallholder farmers could also choose to convert the accumulated value of the savings account into an annuity that might, for example, provide monthly payments after retirement. Integrated risk management solutions which combine insurance protection with a savings component (savings-linked) have become popular over the last few years. In the Philippines, Oro Integrated Cooperative (OIC) and Nabunturan Integrated Cooperative (NICO), two savings and credit cooperatives in the country have been offering these savings-linked risk management solutions over the past few years. NICO's Health Saver is a five-year savings product with added health insurance in which customers save a small monthly deposit for five years that earns an interest rate that is higher than that commonly offered by savings accounts. Health Saver's clients pay for the insurance premiums for the first year. From the second year onwards, insurance premiums can be paid by customers or deducted from the savings account. In case of hospitalisation, members of NICO's Health Saver avail of [PhilHealth](#) insurance and NICO's hospital income benefit. In case of a shortfall, customers can withdraw from the savings account. Moreover, in case of further shortfall, they can apply for a loan with NICO. NICO's Health Saver has a pre-termination penalty to ensure savings are used for health purposes. Similarly, OIC's Health and Disaster Savings is a five-year savings product with health coverage that adds free calamity protection (fire, earthquake, typhoon, volcanic, eruption and floods) when the accumulated balance in the savings account

<sup>3</sup> Although donor agencies and NGOs are usually considered as independent stakeholders, there are organizations that provide funding and actively participate in the implementation of an inclusive insurance product. In other words, these organizations play both the role of donors and NGOs. One example is [PharmAccess Foundation](#), a Dutch not-for-profit NGO that has been offering health inclusive insurance products in Africa ([Richardson, 2011](#)).

<sup>4</sup> There are two main approaches in which insurance companies develop index-based products: (1) they have their own index provider (internally developed); (2) they appoint other organizations that charge them an amount in exchange of the provision of the index services. This amount can depend, for example, in the number of customers enrolled in the insurance programme. The structure of the proposed impact insurance solution showed in Figure 1 considers the latter. However, the former model could be also considered. Examples of index providers include [CelsiusPro](#) and [eLeaf](#).

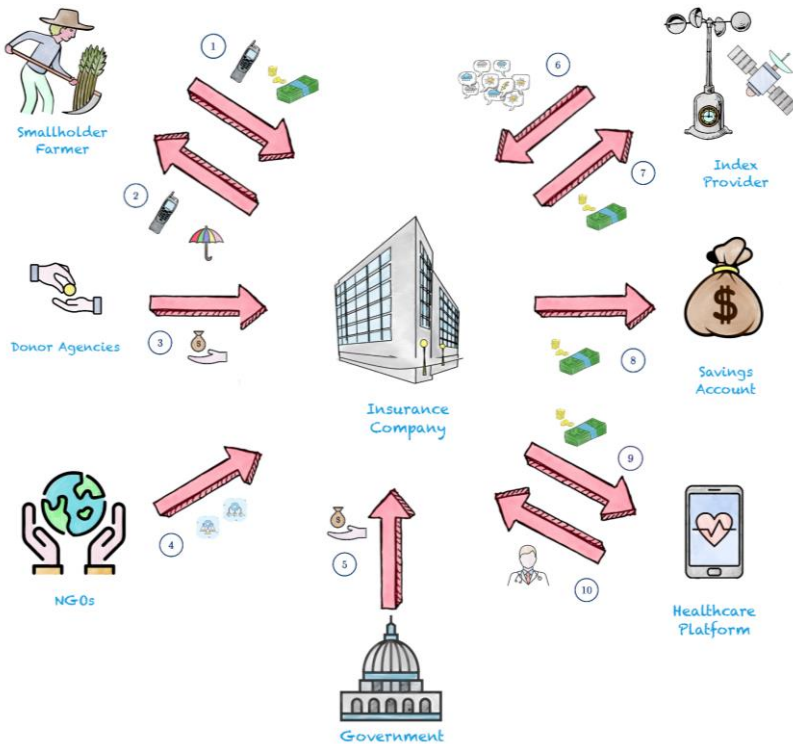
reaches certain amount and OIC's SAFE Plus for the Co Op Kid is a ten-year savings product (or until the member's child enters college) with an embedded life insurance coverage equal to the accumulated balance of the savings account. SAFE Plus for the Co Op Kid allows members to withdraw money from the savings account twice a year over the duration of the college term, while in the event of the account holder's death, the child can receive the accumulated amount when he or she reaches legal age<sup>5</sup>. The proposed impact insurance solution would likely consider a medium-term (from two to ten years) maturity, with saving deposits constituting a portion of the premium payments. Hence, regular premium payments (e.g. weekly, monthly, etc.) would be more appropriate.

9. The healthcare platform will receive a portion of the premium paid by the smallholder farmers and the premium subsidies provided by donor agencies, NGOs and governments in exchange of the provision of technology-driven healthcare to smallholder farmers.
10. The healthcare platform will provide convenient and reliable healthcare services to the smallholder farmers. These could include, for example, among many others, interaction with qualified doctors through voice calls, video calls or chat. Healthcare services such as medical consultations and medication support could be provided through mobile phones. In addition, other services such as lab tests and other medications ordering could be also offered by the impact insurance solution.

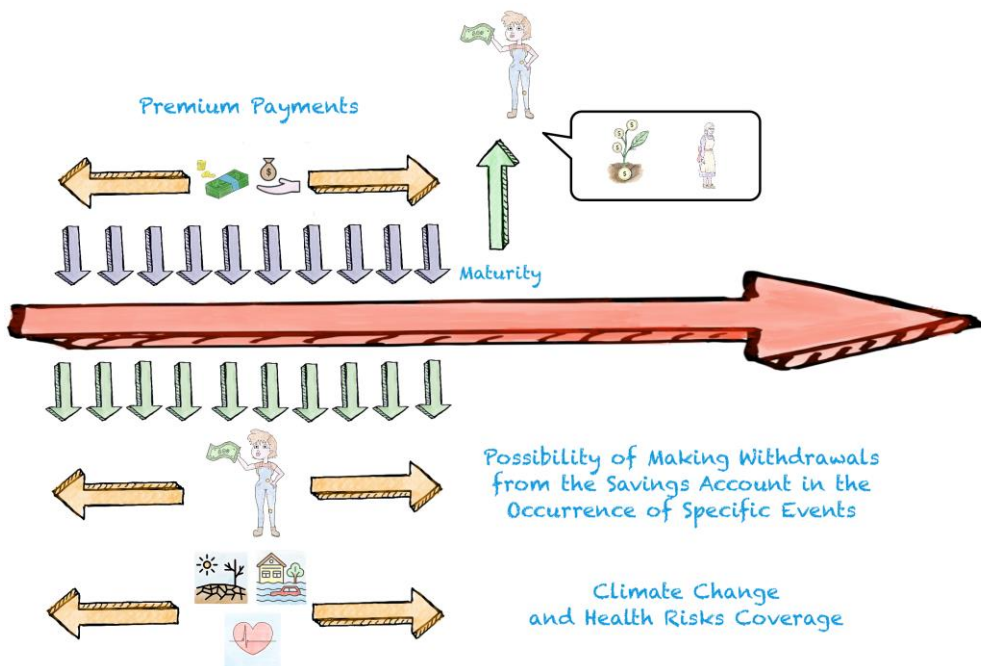
Figure 2 shows a rough timeline of the impact insurance solution. Here, we can see that after the first premium payment is done, the insurance coverage and the savings account commence. That is, in case there is a climate change risk that affects the crops of the smallholder farmer then the index-insurance will indemnify the farmer. Moreover, if there is a healthcare need, the solution's healthcare coverage will also protect the farmer. In case the smallholder farmer passes away, the accumulated balance of the savings account would be paid out to a family member. On the other hand, if the smallholder farmer survives up to the date of maturity, he would have the choice of receiving the accumulated balance of the savings account as a lump sum amount or as an annuity. As mentioned previously, this accumulated amount could, for example, provide the opportunity to smallholder farmers to invest in new projects or it could also ensure they will have an extra earning for their retirement.

<sup>5</sup> For more information about the abovementioned savings-linked inclusive insurance products the interested reader may wish to consult the following Webinar: [Integrated risk management solutions](#).

► Figure 1. Major components of the proposed impact insurance solution



► Figure 2. A rough timeline of the proposed impact insurance solution



### ► 3. Proposed framework to assess the performance of the impact insurance solution for smallholder farmers

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A valuable component of an inclusive insurance solution's value chain is the measurement, or assessment, of the financial and social performance of the programme. One of the main goals of the assessment is to answer questions such as:

- Is the solution providing real value to clients?
- How efficient is the inclusive insurance solution?
- Is the inclusive insurance programme sustainable in the long-term?

The measurement process is frequently executed on a periodic basis (yearly, semi-annually) and relies on monitoring some specific metrics, commonly known as key performance indicators (KPIs), which are focused on assessing the current and future success of an organization ([Parmenter, 2015](#)). The right choice of indicators shine light on performance and highlight areas that need attention for improvement ([Marr, 2012](#)). Furthermore, these metrics tend to be SMART (Specific, Measurable, Attainable, Realistic and Timely). In particular, for inclusive insurance, several measures whose main purpose is the measurement of the overall performance of an inclusive insurance solution, have been proposed and used across different programmes around the world. These indicators are usually grouped into six different performance areas ([Wipf & Garand, 2010](#); [Sandmark, 2013](#)): (1) Product value, (2) Product awareness and satisfaction, (3) Service quality, (4) Financial prudence, (5) Client protection and (6) Inclusion. Similarly, they are categorised into two different scopes: (1) Financial performance and (2) Social performance. Table 1 shows a non-exhaustive list of several KPIs that are helpful to evaluate the overall performance of an inclusive insurance solution during some period "n".

[Garand, et al. \(2010a\)](#) and [Garand, et al. \(2010b\)](#) propose a preliminary assessment framework for the performance evaluation of government-sponsored health-insurance programmes. They consolidate different performance measures used by five programmes previously launched in different countries:

- Rashtriya Swasthya Bima Yojana (India)
- National Health Insurance Scheme (Ghana)
- Universal Coverage Scheme (Thailand)
- Cellule Technique d'Appui aux Mutuelles de Santé (Rwanda)
- Jaminan Kesehatan Nasional (Indonesia)

According to the authors, government-sponsored health-insurance programmes' KPIs assessment frameworks should include a mix of process, outcome and impact indicators that measure how well a programme is running its activities, how well a programme's interventions have achieved the intended objective(s) and how the programme has contributed to the overall health status of its beneficiaries, respectively. Moreover, indicators are categorised into three groups: (1) Long-term effectiveness, (2) Client value and (3) Quality. The monitoring framework proposed by [Garand, et al. \(2010a\)](#) and [Garand, et al. \(2010b\)](#) was built on the principle that efficient management will ensure optimal use of resources and will build the case for achieving long-term sustainability (efficiency); some indicators are more difficult to measure than others depending on the availability of data, the nature of the KPI and the managerial capability of the programme (measurability); the framework should include input, output, outcome and impact metrics (comprehensiveness); common indicators used across programmes should be identified (commonality). Table 2 shows a list of the proposed KPIs for the assessment of the overall performance of a government-sponsored health inclusive insurance solution.

► Table 1. Examples of KPIs for inclusive insurance

| KPI                             | Formula                                                                               | Key Questions                                                                                                | Category                           | Scope                 |
|---------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------|
| Incurred expense ratio          | $\frac{Incurred\ expenses_n}{Earned\ premium_n}$                                      | → How efficient is the delivery of inclusive insurance?                                                      | Product value                      | Financial performance |
| Incurred claims ratio           | $\frac{Incurred\ claims_n}{Earned\ premium_n}$                                        | → How valuable is inclusive insurance to the insured?                                                        |                                    |                       |
| Net income ratio                | $\frac{Net\ income_n}{Earned\ premium_n}$                                             | → Is the inclusive insurance product or programme viable?                                                    |                                    |                       |
| Renewal ratio                   | $\frac{Number\ of\ renewals_n}{Number\ of\ potential\ renewals_n}$                    | → How satisfied is the insured?                                                                              | Product awareness and satisfaction |                       |
| Coverage ratio                  | $\frac{Number\ of\ active\ insured_n}{Target\ population_n}$                          | → How well does the product meets the true need?                                                             |                                    |                       |
| Growth ratio                    | $\frac{Number\ of\ insured_n - Number\ of\ insured_{n-1}}{Number\ of\ insured_{n-1}}$ | → How well developed is insurance awareness?                                                                 |                                    |                       |
|                                 |                                                                                       | → How competitive is the product vis-à-vis other products or household risk management alternatives?         |                                    |                       |
| Promptness of claims settlement | Analytical breakdown of service times taken to report and process a set of claims.    | → How responsive is the service?                                                                             | Service quality                    |                       |
| Claims rejection ratio          | $\frac{Number\ of\ claims\ rejected}{Number\ of\ claims\ in\ the\ sample}$            | → How well does the product fits the insured's needs?<br>→ How well does the insured understand the product? |                                    |                       |
| Solvency ratio                  | $\frac{Admitted\ assets_n}{Liabilities_n}$                                            | → What is the insurer's ability to meet future obligations?                                                  | Financial prudence                 |                       |
| Liquidity ratio                 | $\frac{Available\ cash\ or\ Cash\ equivalents_n}{Short - term\ payables_n}$           | → How readily can the insurer meet its short-term expense and claim obligations?                             |                                    |                       |

|                                              |                                                                                              |                                                                                                                                                                                                                 |                   |                    |
|----------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| Complaints ratio                             | $\frac{\text{Number of complains registered}}{\text{Total number of clients}}$               | → Are there accessible and effective mechanisms for client recourse?<br>→ Are complaints dealt with?                                                                                                            | Client protection | Social Performance |
| Percentage of insured below the poverty line | $\frac{\text{Number of clients below defined poverty line}}{\text{Total number of clients}}$ | → Does the insurance cover achieve high rates of participation and penetration amongst the poor?<br>→ Is the product designed to overcome obstacles faced by the poor in accessing or using the services?       | Inclusion         |                    |
| Percentage of female insured                 | $\frac{\text{Number of women clients}}{\text{Total number of clients}}$                      | → Does the insurance cover achieve high rates of participation and penetration amongst women?<br>→ Is the product designed to overcome obstacles faced by women in accessing or using the services?             |                   |                    |
| Percentage of insured above retirement age   | $\frac{\text{Number of persons above retirement age}}{\text{Total number of clients}}$       | → Does the insurance cover achieve high rates of participation and penetration amongst the elderly?<br>→ Is the product designed to overcome obstacles faced by the elderly in accessing or using the services? |                   |                    |
| Social investment ratio                      | $\frac{\text{Social investment expenses}}{\text{Earned premium}}$                            | → Does the inclusive insurance provider, in addition to the product offered, seek to improve the risk management capacity of the community in which it operates?                                                |                   |                    |

► **Table 2. KPIs proposed by Garand et al 2010a and Garand et al 2010b for government-sponsored health inclusive insurance**

| Category                | Indicator                                                 | Definition                                                                                    | Significance                                            |
|-------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Long-term effectiveness | Net income Ratio                                          | $\frac{\text{Net income}}{\text{Earned premium}}$                                             | Measures the overall viability/profitability            |
|                         | Subsidies/Total revenue                                   | $\frac{\text{Subsidies}}{\text{Total revenue}}$                                               | Proportion of subsidies relative to total revenue       |
|                         | Incurred claims per capita                                | $\frac{\text{Amount of incurred claims}}{\text{Total enrolled population}}$                   | Overview of the cost of coverage                        |
|                         | Poverty outreach ratio                                    | $\frac{\text{Poor insured under the programme}}{\text{Total poor population of the country}}$ | Measures outreach among the country's poor              |
| Client value            | Incurred expense ratio                                    | $\frac{\text{Incurred expenses}}{\text{Earned premium}}$                                      | Primary indicator of administrative efficiency          |
|                         | Incurred claims ratio                                     | $\frac{\text{Incurred claims}}{\text{Earned premium}}$                                        | Value to the beneficiaries and programme viability      |
|                         | Mortality rates (infant and maternal) and life expectancy | $\frac{\text{Number of deaths}}{\text{Live births}}$                                          | Measures overall health impact on the target population |
|                         | Out-of-pocket (OOP) spending on health                    | OOP as a per cent of total health expenditure                                                 |                                                         |

|         |                                    |                                                                                                                                 |                                                                                                                                        |
|---------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Quality | Benefit coverage rate              | $\frac{\text{Number of reported medical cases covered under the health insurance scheme}}{\text{Total reported medical cases}}$ | Measures service coverage, i.e. quality of the benefit package                                                                         |
|         | Complaint ratio                    | $\frac{\text{Total number of complaints registered}}{\text{Total number of insured individuals}}$                               | Measures insured's satisfaction with product and processes as well as the effectiveness of programme's complaint resolution mechanisms |
|         | Promptness of payment to providers | Time taken in payment to the providers from the date claim was incurred                                                         | Measures service quality and effectiveness of programme processes                                                                      |

The overall financial and social performance of the proposed impact insurance solution for smallholder farmers resilience building will be evaluated through the implementation of appropriate KPIs similar to the ones previously listed. For instance, one of the main objectives of the solution is to reach those smallholder farmers who are most in need; that is, the vulnerable non-poor or those who live closest to the poverty line. For us to be able to assess whether the objective is being reached or not, we could compute an indicator that calculates the ratio between the number of vulnerable non-poor smallholder farmers insured by the solution and the total number of smallholder farmers that are insured by the solution. As mentioned previously, the impact insurance solution also seeks to be viewed as a gender-inclusive product. Thus, calculating a “Percentage of Female Smallholder Farmers” indicator could help substantially to evaluate the product's gender-inclusiveness. In like manner, we could define and implement other indicators to measure several particular performance areas of the inclusive insurance solution.

## ► 4. Concluding remarks

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The lack of awareness and access to insurance that characterises smallholder farmers, as well as the importance that this sector of the population represents for humanity, serve as the main catalysts for the formulation of the innovative risk management strategy presented in this paper.

The product combines both insurance and savings components to enhance smallholder farmers' resilience. While the former protects smallholder farmers against climate change and health risks, the latter serves as a buffer against short-term needs or could also represent a long-term investment for other purposes, such as retirement. The idea of placing insurance into a basket together with another financial product such as savings is motivated by the fact that, if performed correctly, bundling inclusive insurance products has shown to, among many other things, help reaching scale and promote gender-inclusiveness.

In addition, the proposed impact insurance solution is boosted by technological breakthroughs. Enrolment, premium payments, claims pay-outs and medical tele-consultations are some of the processes that can be performed within, for example, a mobile phone application. Besides, weather stations and satellites also play an important role for the insurance product, since they will provide with the required data to build reliable indices for the index-insurance component.

Certainly, PPPs established by governments, private insurers, donor agencies, NGOs and other external stakeholders, which among many other aspects, could support with the provision of subsidies to smallholder farmers, are also key to reach the long-term sustainability of the impact insurance solution.

Finally, the implementation of an appropriate monitoring framework that evaluates the overall performance of the inclusive insurance solution is critical to measure the financial and social performance of the program now and in the future.

## ► 5. References

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