

## **AGRICULTURAL INSURANCE**

### Policies and Programs for Reducing Farmer Risk

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#### **Key messages**

- Farm households face numerous risks that can discourage investments and trap them in poverty. Insurance should be a useful tool to reduce this risk, but agricultural risks are inherently difficult to insure against, and farmers' insurance preferences and capacity to pay are diverse.
- Many governments provided subsidized multi-peril crop insurance in the 1970s, but these programs were largely abandoned given their high cost for governments, the inappropriate incentives they created for farmers and lenders, and in many cases because they had also become corrupt and subject to political interference.
- Index-based insurance, based on rainfall or weather measurements at local weather stations, remote sensing, or area-yield assessments, was pioneered in the 1990s. Although these products showed promise, demand was low, especially among smallholders.
- Research identified many factors associated with low demand, including affordability, gender, limited education, and lack of trust; but most prominent was the finding that basis risk—the difference between insurance payouts and actual losses—is likely to undermine uptake.
- Evidence shows that when farmers are confident in being covered by insurance, they substantially increase farm investments, including in higher-return activities.
- Recent focus has been on designing and testing new insurance products that are potentially more attractive to farmers. Many rely on innovative

technologies to reduce basis risk, while others are testing “bundles” of products, insurance education, and easier payment schedules to increase attractiveness. Nevertheless, these products continue to leave many vulnerable farmers without insurance.

Looking to the future, research on agricultural insurance should:

- **Enhance the value of insurance for farmers**, recognizing that it may only be possible to insure part of the risk farmers face with market instruments alone. This may require introducing more holistic insurance instruments that tackle multiple risks at once, designing optimal bundles of insurance with other products and technologies (ideally risk-reducing ones such as improved seeds or seasonal weather forecasting), or designing insurance that complements existing ways of managing risk (such as informal transfers from family and friends during crisis times).
- **Integrate insurance with agricultural digital tools** to increase access for underserved populations, reduce costs, and contribute to the scaling of insurance products. Use of artificial intelligence, for instance through image recognition or large language models, can help improve index accuracy, insurance understanding, and client-insurer interactions.
- **Better integrate the design and development of agricultural insurance** with alternative risk management options available to farm households and with other forms of public assistance, such as safety net programs and emergency relief.
- **Provide empirical cost-benefit analyses of different types of insurance subsidies** to better inform policy choices. Research should analyze different insurance models and compare them to alternative ways of reducing and managing risk.

Farm households face a host of market and production risks that can threaten their livelihoods and food security, lead to loss of capital assets and reduced ability to repay debt and, over time, trap them in poverty (Carter and Barrett 2006; Dercon and Hoddinott 2004). Moreover, since new technologies or farming practices that could increase long-term farm productivity and household welfare are often more risky than established technologies and practices, farmers can be discouraged from adopting or investing in them. In principle, insurance against production risks should be a useful aid for farm households by transferring part of their risk to the insurance market, but unfortunately many agricultural risks are inherently difficult to insure against.

## The insurance supply problem

Insurance works best for risks that are known (allowing it to be appropriately priced), unlikely to hit all people insured at once (allowing risks to be pooled), and which cannot be influenced by those insured through neglectful or deliberate mismanagement (the so-called *moral hazard* problem). Life, medical, and auto insurance typically meet these requirements and are widely available from private insurers, but apart from some specific perils like hail, most agricultural production and market risks do not meet them. For instance, data for pricing risks (time-series data on individual farm or plot-level yields) are mostly unavailable, and climate change is increasing the frequency and severity of future production losses in ways that are difficult to predict. At the same time, hazards that impact crop yields and livestock mortality tend to affect many farmers in one location simultaneously (that is, the risk is *covariate*), making it difficult to pool risks. Market or price risks pose a similar covariate problem, worsened by the fact that they are affected by political and economic forces that are inherently difficult to predict for insurance purposes. Additionally, assessing agricultural losses can be cost-prohibitive due to short timeframes around harvest and the remoteness of many farms in low- and middle-income countries (LMICs). Such constraints can also reduce the ability of insurers to monitor farmers' management practices to limit moral hazard problems.

The diversity of farmers' insurance needs also makes agricultural insurance markets challenging to sustain. Differences in farmers' risk exposure require insurers to pool farmers facing similar risks into groups who can be offered the same contracts. However, for any given contract, only those farmers facing average or higher than average levels of risk tend to purchase the insurance while lower risk farmers opt out (the *adverse selection* problem). The insurer must then raise the premium rate to reflect the higher average risk level of the remaining pool of insured farmers, which in turn can lead to more lower-risk farmers opting out of the pool. The subsequent downward spiral can eventually undermine the financial viability of the insurance contract.

For these reasons, private agricultural insurance products that have reached scale without any subsidies have been largely limited to specific perils like hail and frost (Hazell and Timu 2024). The few attempts to provide comprehensive coverage for crop and livestock losses on a commercial basis either failed or only reached small niche markets, such as insuring commercial farmers for high-value products or tree crops.

The absence of adequate insurance against agricultural losses has long concerned governments, and increasingly so as climate change increases both the likelihood and severity of climate-related losses (see Box 10.1 on rates of

**BOX 10.1 Regional distribution of insured crop farms, coverage, and vulnerable households (percent)**

Region	Insured farms 2020	Premiums collected 2020	Value of insurance coverage 2020	Insured farms as share of all farms 2015	Total premium collected as share of agricultural GDP 2017	Share of total population vulnerable and exposed to natural hazards 2021
Asia	98.1	92.7	96.8	61.7	0.60	20.4
China & India	95.0	91.2	96.3	74.9		
Other	3.1	1.5	0.5	9.7		
Africa	1.5	0.2	0.1	7.6	0.08	36.1
LAC	0.4	7.1	3.1	4.8	0.45	15.6
Total	100.0	100.0	100.0	53.5		

**Source:** Calculated from GIZ (2021), Swiss Re (2019), Lowder et al. (2016), and Hill et al. (2024).

**Note:** These are approximate figures, as there is variation in the years for which data are available both between and within columns, and not all the underlying data sources provide full country representation.

Across Asia, Africa, and Latin America and the Caribbean, 53.5 percent of all farms are insured, but 95 percent of all the insured farms are located in China and India, where they benefit from heavily subsidized national programs. Elsewhere, very few farms are insured and insurance covers just a tiny fraction of farmers' exposure, as indicated by very low ratios of premiums collected to agricultural GDP, and very large shares of the population remain exposed to natural hazards with little capacity to cope with these threats.

coverage). This concern has led to many attempts both to provide publicly supported insurance programs to protect farmers against production losses and to intervene in agricultural markets to help reduce price risks for farmers.

We limit our review to the development of agricultural insurance programs and to recent innovations that are helping to make insurance more commercially viable, while also flagging IFPRI's contributions to these developments.

## Initial government responses

Given the limited development of private agricultural insurance markets, many governments have sought to support farmers by offering multi-peril crop insurance (MPCI) programs, which provide comprehensive coverage against

a wide array of production risks on an indemnity basis. One of the earliest of these was the Federal Crop Insurance Corporation program established in the United States in 1938. By the 1970s, there were many such programs around the world, which often tied the insurance to credit by underwriting farm loans provided by state-owned agricultural development banks. Given the high cost of providing such broad coverage, substantial subsidies were needed to make insurance premiums affordable to most farmers and achieve the desired scale of coverage, and by the late 1970s, several billion dollars were spent globally each year on public subsidies for MPCCI programs.

To assess the value of MPCCI programs, IFPRI and the Inter-American Institute for Cooperation on Agriculture (IICA) cosponsored a set of case studies of insurance programs in Australia, Brazil, Japan, Mexico, Panama, and the United States, and organized an international conference on crop insurance and agricultural credit in 1982 (Hazell et al. 1986; Hazell and Valdés 1984). They concluded that the MPCCI programs were very expensive for governments yet failed to achieve their primary purposes. These programs faced serious moral hazard problems, encouraged farmers to take excessive risks, undermined good insurance and bank lending practices, and in many cases had become corrupt and subject to political interference. The findings attracted the attention of several national and international aid agencies and contributed to the phasing out or revamping of most MPCCI programs by the end of the century.

The need for effective agricultural insurance remained, and IFPRI, among others, began research in the early 1990s on the potential of index-based insurance (IBI) products to fill the gap. By basing insurance payouts on an objectively measured index for a geographic area, such as readings from a local weather station, satellite imagery, or average crop yields in the area (area-yield insurance), IBI should reduce the cost of providing insurance by eliminating the need for assessing farm-level losses and reducing incentives for engaging in moral hazard (since payouts are determined by an index beyond the farmer's control, instead of farm-level losses). Several countries, including India, had already established area-yield insurance schemes (Dandekar 1976), and new possibilities were seen for rainfall-based indexes using local weather station data (Miranda 1991). A growing literature, including research conducted by IFPRI together with the World Bank and several universities on the feasibility of weather-based IBI, saw sufficient potential to warrant its further development (for example, Hazell 1992; Miranda 1991; Skees et al. 1999.) Several weather-based IBI programs were pioneered around the world in the late 1990s, and many more were launched soon after, especially once

remote-sensing data and crop modeling techniques became available for constructing new types of indexes.<sup>1</sup> But unless heavily subsidized (as in India and the United States), these schemes rarely achieved scale. The overall low demand for these products led to additional research and pilot programs to better understand the barriers holding back IBI.

## The farmer demand problem

A key question was understanding low farmer demand: was the price of commercially provided insurance just too high (although heralded as being cheaper than conventional MPCI, IBI premiums were often found to be well above actuarially fair levels), was the quality of IBI products just too poor (as a result of *basis risk*), or were farmers constrained from adopting IBI due to other reasons, such as limited liquidity, low levels of financial literacy and education, or lack of trust in the product and insurance providers (Binswanger-Mkhize 2012; Hazell and Timu 2021)?

Basis risk emerged as a key challenge that could undermine uptake of IBI even when offered at affordable premiums. For some of the early products, the payouts determined by the index were very poorly correlated with farmers' losses (Clarke 2016). Moreover, studies in Bangladesh (Clarke et al. 2016; Hill et al. 2019) and India (Hill et al. 2016) confirmed previous findings in the literature<sup>2</sup> that farmers' demand for insurance was fairly price inelastic (that is, not responsive to price changes) and, in some cases, sufficiently inelastic that premium subsidies had limited ability to raise demand. Together, these studies led to considerable work on how to improve the indexes (Carter 2009) and to an examination of the sensitivity of demand to basis risk. Ultimately, it became clear that further innovation was needed to develop affordable, high-quality insurance products that better fit farmers' needs.

The evidence produced by IFPRI and other researchers also pointed to other factors constraining potential demand. Household wealth was found to be positively associated with the demand for insurance (Clarke and Kumar 2016; Hill et al. 2013), and experimental evidence was consistent with liquidity constraints dampening demand (Casaburi and Willis 2018; Liu et al.

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1 Good examples were pilot programs initiated by nongovernmental organizations, researchers, and charitable foundations. For example, Oxfam launched the Horn of Africa Risk Transfer for Adaptation (HARITA) initiative in Ethiopia; the Syngenta Foundation launched the Kilimo Salama project (later ACRE Africa) in Kenya; and ILRI led the launch of the Index Based Livestock Insurance in Kenya.

2 For example, see Cole et al. (2013), Karlan et al. (2014), and Mobarak and Rosenzweig (2013).

2020). The impact of farmers' risk aversion on uptake of agricultural insurance was found to be mixed; in some cases, findings aligned with theoretical predictions (Casaburi and Willis 2018; Liu et al. 2020) that demand would increase with low- to moderate-risk aversion but eventually decrease at higher levels of risk aversion, as basis risk made benefits from the insurance uncertain (Hill et al. 2016). Women farmers were in some cases shown to be less likely to buy insurance than men (Akter et al. 2016; Clarke and Kumar 2016; Delavallade et al. 2015). Demand could be fostered by intensive training and learning through experience (Cai and Song 2017; Hill et al. 2016, 2019). Trust was also found to be an important determinant of demand, with higher uptake from farmers who had prior experience with the insurer (Giné et al. 2008), who had received an endorsement from a trusted local source (Cole et al. 2013) or government agents (Akter et al. 2016), or who had received a payout themselves or witnessed others in their community receive a payout (Cole et al. 2014; Hill et al. 2016; Stein 2018).

Importantly, although many insurance pilots struggled with low levels of demand, several studies demonstrated the considerable potential of insurance to increase productivity and improve welfare: when farmers trusted they were insured, they undertook higher-risk but also higher-return activities, with up to a 30 percent increase in farm investments.<sup>3</sup> While quantifying the returns to increased input investment is not trivial, since these typically vary across settings and years (depending on weather conditions and prices), even assuming a relatively low average return to input use, the reported additional investments can lead to an average increase in income growth of 1 to 9 percent.

## **New types of insurance products**

Motivated by the challenges of low demand, combined with the finding that transferring risk away from farmers through insurance could result in increased investments in agriculture, from about 2010 onward IFPRI and other researchers focused on designing and testing new types of financially viable insurance products with potential to be more attractive to farmers.

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3 See Mobarak and Rosenzweig (2013) for rainfall-index insurance in India; Elabed and Carter (2015) for area-yield insurance in Mali; Karlan et al. (2014) for rainfall-index insurance in Ghana; Cai et al. (2015) for swine insurance in China; Cai (2016) for area-yield insurance in China; Fuchs and Wolff (2016) for rainfall-index insurance in Mexico; Jensen, Barrett, and Mude (2017) for livestock insurance in Kenya; Hill et al. (2019) for rainfall-index and area-yield insurance in Bangladesh; Bulte et al. (2020) for multi-peril crop insurance in Kenya; and Stoeffler et al. (2022) for area-yield insurance in Burkina Faso.

Remote-sensing products using higher spatial resolution satellite imagery—such as the European Space Agency’s Sentinel suite—were developed to improve localized damage assessment for weather-based IBI (Black et al. 2016; Enenkel et al. 2018). In fact, some of the most successful index insurance products offered at scale use remote-sensing technology, such as vegetation index–based livestock insurance (Chantararat et al. 2013; Jensen et al. 2024) and rainfall index–based replanting guarantees. For example, ACRE Africa, a major agricultural insurance service provider in Africa, provides farmers with cash to buy new seed if rains fail after planting. Nevertheless, the capacity of these products to estimate localized damage remains limited—particularly when it comes to very small and fragmented fields in LMICs. They also face difficulties in reliably predicting actual plant or animal health from remotely sensed data, especially when identifying crop damage in intercropped fields or due to visibility issues from cloud cover. Thus, while useful in some contexts, satellite products were not able to fully resolve the issues with earlier products.

Area-yield indexes underpin the largest public crop insurance schemes in places where crop yield measurement for insured areas can be done cost-effectively, namely India (Clarke et al. 2016) and China (Cai et al. 2020). If agroecological zones are well defined and a sufficiently large number of fields can be sampled for crop yield measurement within an insured area, the basis risk associated with area-yield contracts can be much lower than in weather-based IBI. However, the costs and logistics of measuring crop yields at a large scale and on a timely basis make it challenging to provide area-yield insurance in many contexts. An innovation known as gap insurance or conditional audits attempts to retain the benefits of area-yield IBI while reducing costs by combining it with weather IBIs. Specifically, these insurance products add a layer of area-yield coverage to redress failures of a primary weather-based index product, reducing the scale at which crop yields need to be measured in a given season by focusing only on areas where the underlying weather index fell short and failed to trigger payouts for farmers who claim to have experienced crop losses. When the product was first tested in a small pilot in Ethiopia (Berhane et al. 2015; Flatnes et al. 2018) and later at a larger scale in Bangladesh by IFPRI researchers (Hill et al. 2019), demand proved to be quite high, although it was not clear whether this resulted from the product’s design or from other contextual factors.

Geographic variability in growing conditions, however, is not the only obstacle that index products face. Data limitations and resource availability at the design phase typically result in indexes that cater to a hypothetical representative

farmer but are too rigid to meet the needs of highly heterogeneous farmer populations. IFPRI researchers attempted to mitigate this issue by offering farmers a menu of smaller insurance products, or “insurance coupons,” each optimized to cover a narrow region of risk (for example, a certain level of excess rainfall in a given calendar month), allowing farmers to purchase a combination or bundle of coupons best suited to their needs. Although trials in Ethiopia and Uruguay showed that farmers valued this innovation, demand remained relatively low (Ceballos and Robles 2020; Hill and Robles 2011).

An additional approach was to market index products to existing informal insurance networks, such as funeral groups or other social networks in which members help each other in times of financial hardship. These products rely on social transfers within the group to provide insurance for idiosyncratic risks that are likely experienced by only a few individual members at a time. These risks are expensive to insure through formal insurance because individual losses are difficult to monitor, but group members tend to have more information about one another than insurers do. Formal insurance, in turn, can focus on covering only covariate risks that are more likely to affect multiple members at once, and are therefore more difficult to cover through informal insurance arrangements (Dercon et al. 2014). Although this innovation did increase demand in an IFPRI pilot in Ethiopia, its large-scale applicability remains limited to settings with similar preexisting institutional arrangements. More recent work, which takes informal risk-sharing into account when designing and marketing formal insurance, caters to rural-urban migrants as a way for them to insure against poor weather conditions at home and has shown relatively high demand, indicating promise for further work in this area (Kazianga and Wahhaj 2020).

To better address basis risk at low cost, IFPRI researchers recently tested a picture-based insurance (PBI) model that relies on smartphone pictures of crop fields to assess damage remotely and at a low cost, thereby combining features of indemnity (field-level damage estimation) and index products (lower cost). Pictures of farmers’ fields, taken by farmers themselves, were sufficient for identifying moderate and severe damage remotely and at a low cost across a number of crops, without widespread fraud (Ceballos et al. 2019). This approach was also shown to increase demand across studies in India, Kenya, and Ethiopia (Kramer, Pattnaik et al., 2024; Kramer, Waweru et al., 2024; Kramer, Porter, and Bizuayehu, 2023), albeit not always sufficiently to bring willingness to pay close to commercial premium levels (Ceballos and Kramer 2019). Impacts on productivity differed across research sites. In India, the innovation had no impacts on input use, agricultural practices, or technology

adoption, whereas in Kenya, PBI improved fertilizer use; but mainly among male farmers, despite increasing insurance take-up mainly among female farmers. Importantly, the innovation seems to be valued by farmers and social enterprises that partnered in these impact evaluations, including ACRE Africa and Dvara E-Registry, which plan to add PBI to their portfolios of financial services. Moreover, PBI can be used either to assess crop damage directly or in combination with other approaches, such as to operationalize the conditional audits or crop yield measurement for farmers who claim to have experienced losses in the gap insurance approach described above.

Beyond basis risk, various studies have looked at other avenues for fostering farmer demand for agricultural insurance products. Recognizing the finding that agricultural risk imposes a higher burden on women (Dercon and Krishnan 2000; Hoddinott and Kinsey 2000; Quisumbing et al. 2018), innovations that consider gender roles, such as by reformulating insurance products to directly address the risks that women face (Arteaga et al. 2023; Hobbs 2022), also hold promise to generate demand (Timu and Kramer 2023). Relaxing farmers' liquidity constraints can boost uptake as well. For example, allowing farmers to defer premium payments to the end of the agricultural season translates into substantial increases in demand (Belissa et al. 2019). This approach works well in settings where insurance is purchased every year (as in the case of swine insurance in China, examined in Liu et al. 2020), which allows insurers to collect premiums for the previous season when the new coverage period begins, or in contract farming settings where premiums can be deducted from farmers' revenues at harvest (Casaburi and Willis 2018). While much of the agricultural insurance sold in the United States is paid for at the end of the insured period, the possibility of default may partly explain why such a model is still rare in LMICs.

Finally, insurance has been effectively bundled with a broad array of products and services, such as credit,<sup>4</sup> which helps address liquidity constraints, and with agricultural inputs, such as seeds of drought-tolerant varieties, which has been associated with larger impacts on demand (Boucher et al. 2024; Kramer, Waweru, and Malacarne 2023). These studies point to a general finding that tying insurance to other products or services and thereby insuring aspects of the production process (whether that is borrowing, input or irrigation costs, or livestock) appears more commercially promising than insuring crop production more generally.

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4 Examples include Giné and Yang (2009); Kramer, Pattnaik et al. (2024); Meyer et al. (2017); Ndegwa et al. (2020); and Shee et al. (2019).

While many of the interventions described above have been successful in raising demand, providing agricultural insurance at scale is likely to require a combination of these. Unfortunately, there do not appear to be any studies of such multipronged approaches. Moreover, while some of the models above—such as bundling insurance with products and services—appear to boost demand considerably, they still leave a large fraction of agricultural production uninsured and often exclude vulnerable farmers who may not normally use the products and services insured.

## Future directions

Significant advances have been made in understanding why farmers' demand for insurance remains low and in designing new products that address demand-side obstacles as well as some supply-side barriers. Despite these advances, agricultural insurance has not taken off at scale without substantial premium subsidies.

There are several promising lines of inquiry that may yet help to shift the paradigm. These include: (1) exploring new digital innovations beyond those discussed above (including artificial intelligence), (2) multidimensional studies of combinations of some of the individual interventions analyzed so far to capture possible synergies between them, (3) linking insurance with new risk-reducing technologies and weather forecasting, and (4) linking market-based insurance approaches with the informal risk-sharing networks on which many poor households rely, including remittances (Jack and Suri 2014). The diversity of farmers' insurance needs also deserves greater recognition, as publicly supported programs often take a one-size-fits-all approach in their quest for scale.

It is important to recognize, however, that insurance can only address certain types of production risks, and that these are often not the most important from the perspective of shortfalls in total farm or household income. It is also important to recognize that farmers have other ways of managing risk, including diversifying into nonfarm sources of income.<sup>5</sup> Other public interventions like social safety nets and disaster relief programs may also provide households with some protection against agricultural losses. Agricultural insurance is, at best, only one of the tools households can use for managing risk, and the

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5 Nonfarm income now accounts for over half of total income for rural households in LMICs, and some studies have shown it can be a useful buffer against agricultural losses (Hazell and Timu 2024).

### BOX 10.2 Role of risk management strategies and insurance by type of farm household and risk

Type of risk (severity of losses increases from top to bottom)	Type of household (capacity to manage risk increases from left to right)		
	Chronically poor	Nonpoor, subsistence- oriented small farms	Commercially oriented small farms
	<b>Risk management strategies and insurance</b>		
Idiosyncratic	Income diversification and regular social protection transfers	Self-insurance (e.g., on-farm and off-farm diversification, credit and savings, membership in a local risk-pooling group), plus asset and personal insurance.	
Intermediate	As above, plus some forms of heavily subsidized insurance	As above, plus climate-smart farming; agricultural and credit insurance might help but may have to be subsidized from high to low across groups.	
Catastrophic	As above, plus disaster assistance	As above, plus disaster assistance and/or catastrophe insurance; catastrophe insurance may have to be subsidized from high to low across groups.	

**Idiosyncratic risks** comprise frequent but typically low-impact losses, such as modest yield and production losses at farm or plot level. **Intermediate risks**, such as frost, hail, or flood damage, involve less frequent but larger losses that may be correlated within groups of households. **Catastrophic risks** are infrequent events, such as severe floods or drought, that have high and systemic impacts affecting many households within a region.

**Chronically poor households** are generally the most vulnerable to risk, with limited options for avoiding or coping with losses. Their primary challenge is protecting household consumption of food and meeting other basic needs, and they are a major target group for social protection programs (see Chapter 11). If insurance has a role for this group, it is probably to protect specific assets like livestock or savings and would need to be heavily subsidized. **Nonpoor, subsistence-oriented farms** have sufficient resources to avoid chronic poverty, but repeated losses can push them into poverty. Subsidized insurance against intermediate risks may be helpful for protecting their incomes and assets and may enable them to invest more in their farms and transition to commercial farming. **Commercially oriented small farms** might also benefit from insurance against intermediate risks, though more to protect against loss of specific agricultural investments than to stabilize household income or consumption. Because of their links to value chains, these farms may have access to insurance through intermediaries that is bundled with services such as credit and modern inputs. **Medium and large commercial farms** face the highest levels of production risk but also have the greatest capacity to self-manage risk. This group is

the most viable clientele for private insurers either directly or through value chain intermediaries and may need little if any premium subsidy. In addition to the subsidies indicated above, subsidies may also be relevant for small-scale meso-insurance schemes that target institutions rather than individuals, for example counties, banks, cooperatives, or savings groups, and underwrite some of the covariate production and market risks. Subsidies may also be justified if insurance is to tackle some of the more catastrophic risks at affordable premium rates and reduce the need for disaster assistance payments.

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**Source:** Adapted from Kramer et al. (2022).

design and development of insurance products need to be better integrated within a broader and more holistic risk-management perspective that considers all these alternatives.

As we seek to design better insurance products, it seems crucial to pay more attention to market and risk segmentation (see Box 10.2) (Kramer et al. 2022). For many smallholders, insurance is best seen as part of a holistic income-support approach, while commercial farmers have more options for managing risk and may benefit more from specific types of indemnity or IBI products to protect agricultural investments. The rationale for premium subsidies should distinguish between commercial and smallholder farmers. Subsidies for smallholders, especially those below or near the poverty line, might best be formally linked to safety net and public relief programs (see Chapter 11),<sup>6</sup> whereas for commercial farmers, subsidies should be directed at overcoming market development problems such as insufficient weather stations, helping to educate farmers about the value of insurance, and underwriting more extreme catastrophic events. Subsidies might also be targeted according to the type of risk being insured. For example, if subsidies were targeted to insurance against catastrophic risks (too expensive for most farmers to insure on their own), there might be more scope for private insurers to offer more affordable insurance for less covariate risks. To support government decision-making, research needs to provide empirical cost-benefit analyses of different types of insurance subsidies and of the cost-effectiveness of insurance

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<sup>6</sup> A good example is the Hunger Safety Net Program (HSNP) in Kenya, which supports poor households on a regular basis but is also empowered to scale up its support to a much wider range of households in the event of major droughts.

compared to alternative instruments for achieving the same goals of protecting incomes and promoting productivity.

Even within a well-balanced scheme of agricultural risk management with appropriate involvement of the public sector and access to financial tools to manage frequent risks, developing private insurance markets requires fostering several interventions at scale and a strong commitment from the private sector, something that has not yet been seen. Most pilot programs have been initiated and developed by researchers, donors, governments, or nongovernmental organizations, and only rarely by the private sector (Hazell et al. 2024). Successful agricultural insurance also requires strong public support and coordination, considering that programs that have successfully scaled up to date have involved heavy premium subsidies.

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