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Small farmer vulnerability and climate risk: Index insurance as a financial fix

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By its very nature, agriculture is a risky endeavor. Farmers not only face natural threats from pests, plant disease, and inclement weather, but many must also worry about fluctuating input costs, uncertain prices for their output, and, ultimately, their ability to repay debts and support their families. The growing incidence of extreme weather events and the rising volatility of agricultural commodity prices has greatly exacerbated the vulnerability of farmers since the turn of the century. This is especially the case for poor farmers in the global South who lack the assets and state protections that help to insulate their more fortunate counterparts.

As elsewhere in contemporary society, the rising vulnerability of agricultural producers has piqued the interest of an ascendant financial sector that seeks to profit from the growing risks and uncertainty faced by individuals in the neoliberal era (c.f. Martin, 2002; Soederberg, 2014). Uncertainty about increasingly volatile crop prices, for instance, has spurred the development of a variety of agricultural derivative products that have been championed as effective tools for risk management by a broad contingent of actors, including financial enterprises, multinational organizations, development agencies, and governments from the North and South (Breger Bush, 2012; Martin & Clapp, 2015). Similarly, to mitigate the growing risks from weather-related events, private insurers—working in tandem with microfinance institutions and with the backing of the World Bank and other major development actors—are increasingly promoting weather insurance among small-scale farmers in Africa, Asia, Latin America, and the Caribbean. This paper considers the latter type of financial intervention, focusing specifically upon a new product known as index-based agricultural insurance (IBAI). The novelty of IBAI is that it links

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indemnity payouts not to the actual losses that farmers suffer in their fields, but rather to environmental measures that serve as a *proxy* for loss, such as rainfall, temperature, wind speed, or the remote sensing of vegetation. In this article, I argue that even though index insurance can help to reduce some of the risks faced by participating farmers, the associated financialization of risk management can compromise existing social and environmental practices that have long underpinned the security of agrarian livelihoods. Additionally, the adoption of IBAI may heighten farmers' exposure to new forms of economic and environmental stress, ultimately exacerbating their overall vulnerability.

New risks

Historically, farmers have managed risks through a combination of traditional agricultural practices, community institutions, and state supports. In their fields, for instance, farmers have mitigated risk through the practice of "diversity management" and the use of crops derived from endemic plant species that are relatively resilient to local stresses. That is, they have planted a variety of crop species that are typically native to their growing environment (inter-crop diversity), using a diverse array of seeds for each crop species (intra-crop diversity), and often dispersing their production across multiple, non-contiguous plots of land (habitat/spatial diversity) (Bellon, 1995; Brush, 2013; Ahmed, this issue). Farming households have also complemented diversity in the field with the diversification of livelihoods, engaging in a variety of economic activities to help ensure a constant stream of income (Ellis, 1998; Isakson, 2009). At the community and regional levels, agrarian societies have developed "moral economies," patterned upon reciprocity and redistribution, which have served to disperse risk across households and over time (Scott, 1976).

Colonial practices and forced integration into state-wide and global agrifood markets undermined—but certainly did not eliminate—these traditional risk-management strategies in many areas of the global South, promoting ambivalent market relations over the guarantees of moral economies and export crops for the European Empire over local crops for domestic consumption (Davis, 2001; Watts, 1984). To protect their farmers from international competition and the uncertainties of the globalized food markets into which they had been inserted, many Third World governments followed the lead of the United States and other global powers and implemented trade protections, price supports, and other protective measures, only to have them dismantled under the neoliberal restructuring of the 1980s and 1990s. These pressures, combined with the simplification of landscapes resulting from agricultural modernization and corporate concentration in agrifood supply chains, have rendered contemporary farmers particularly vulnerable to economic stress and environmental hazards (Clapp, 2012; Watts & Bohle, 1993). The recent conjuncture of food price volatility and climate change—the so-called "double exposure"—has brought the precarious situation of farmers, particularly small-scale farmers with few assets, into sharp focus (c.f. O'Brien & Leichenko, 2000).

Of course, farmers are not the only actors facing new risks in contemporary society. Indeed, the developments in agriculture are part of a broader trend wherein modern day citizens no longer benefit from the right to security that was previously guaranteed by Fordist employers and Keynesian welfare states. Instead, they face a world of uncertainty in which they are individually responsible for managing risk. This is part of the familiar narrative of the "risk society" in which the uncertainty of livelihoods and social reproduction has been privatized (Beck, 1992; Hacker, 2008; Maurer, 1999; Soederberg, 2014). The heightened uncertainties within this society represent new openings for the speculative activities (i.e., gambling) of finance capital. Whereas states and community-based institutions had previously helped to mitigate risks, individuals are now expected to manage them through the purchase of financial instruments. Randy Martin (2002) and others have referred to this development as the "financialization of daily life," or the process wherein the relations between people and things are transformed into relations that motivate or require financial logics and transactions (c.f. Johnson, 2013).

In agriculture, the World Bank and other prominent development actors have promoted the financialization of daily life under the agenda of "financial inclusion," or the idea that democratizing access to finance capital through microfinance and other schemes is an adequate—and indeed superior—alternative to the inefficient and corruption-prone guarantees of the regulatory welfare state[1] (Cull, Ehrbeck, & Holle, 2014; Roy, 2010; United Nations, 2006). The most prominent example of this, of course, is the promotion of microloans that will ostensibly improve poor farmers' access to productive capital, thereby unleashing their latent entrepreneurial potential while spurring pro-poor economic growth. Yet the promotion of index-based agricultural insurance also falls under the rubric of financial inclusion and, as such, increasingly figures in contemporary development initiatives.

Advocacy for index insurance

As noted above, index insurance is different from traditional agricultural insurance wherein indemnity payouts are based upon actual crop losses. Instead, under IBAI, payouts are based upon the value of an index of objective measures that are correlated with agricultural performance (e.g., rainfall, temperature, wind speed). Skees and Collier (2008) provide a helpful example:

> Consider a drought index insurance contract that pays an indemnity anytime that cumulative rainfall during a critical two month period of the growing season is less than 100 millimeters. Indemnity payments would increase proportionately as the measure of rainfall declines until a pre-specified limit is reached.

[1] Susanne Soederberg (2014) refers to this transformation as the rise of the "debtfare state."

> For example, the maximum indemnity will be paid whenever cumulative rainfall is less than or equal to 50 millimeters. In this example, the contract is said to have a threshold (or strike) of 100 millimeters and a limit of 50 millimeters (p. 6).

The practice of tying indemnity payments to such indices is relatively new. Its origins can be found in the international weather derivatives markets that emerged in the late 1990s and allow commercial enterprises to hedge against the potentially adverse effects of weather on their business practices (Skees, Hazell, & Miranda, 1999; World Bank, 2011). Indeed, index insurance is more akin to a financial derivative than conventional insurance. Policy holders are, in fact, betting on the weather and other natural events rather than insuring against actual crop loss (Johnson, 2013). No claims adjustors visit the fields of farmers who hold index insurance policies. Depending on index measurements, policy holders might receive an indemnity payment even when they do not suffer a loss or, conversely, they might not receive a payment when they do. The fact that indices can vary from actual crop performance is known as "basis risk," which can be quite high and must be borne by the policyholder if IBAI is to be financially viable (Collier, Skees, & Barnett, 2009).

Despite the uncertainty posed by basis risk, there are a number of purported benefits ascribed to index insurance. For insurers, IBAI: (1) reduces the transaction costs of verifying losses; (2) resolves the problem of "moral hazard", wherein policyholders alter their behaviour in order to receive a payout; and (3) decreases the problem of "adverse selection" in which insurance is inordinately purchased by those exposed to higher-than-average risks. By resolving these problems, index insurance is commonly understood as a superior alternative to conventional agricultural insurance, which has been condemned as an inefficient institution in which the social benefits are not justified by the costs (Hazell, 1992). Moreover, IBAI is touted as a pro-poor initiative that expands opportunities to small-scale farmers who are often excluded from insurance markets. Buyers of indexed insurance policies do not have to prove their ownership of assets and, by eliminating the need for loss adjustments, the practice makes it more affordable to insure small plots of land (Johnson, 2013; Skees & Collier, 2008). Index insurance is thus often understood as a type of micro-insurance that advances the development objective of financially including the rural poor.

Touting its purported benefits, a variety of development actors have championed IBAI. Programs have been sponsored by a number of major governmental agencies (e.g., U.S. Agency for International Development, German Agency for International Cooperation) and non-governmental development agencies (e.g., Oxfam, Mercy Corps). These organizations often work in tandem with governments from the global South, and market and manage their products through microfinance institutions, with backing and technical support from traditional financial institutions including major international reinsurers like Swiss Re. The World Bank's International Financial Corporation (IFC) has been one of its biggest promoters. Through its Global Index Insurance Facility (GIIF), the IFC provided index insurance to nearly 650,000 farmers for a total portfolio of US$119 million between 2009 and 2013 (IFC, 2014). Since the

turn of the century, GIIF and its counterparts have launched more than 35 programs throughout the global South. Many more pilots are in planning and there is talk of scaling up existing initiatives (Johnson, 2013; Peterson, 2012).

IBAI also figures as a prominent strategy in the FAO's call for "Climate-Smart Agriculture" (FAO, 2013). It has also caught the interest of major agro-input suppliers. For instance, Syngenta Foundation, the nominally philanthropic arm of the Swiss agrochemical giant, launched a weather-based product in Kenya in 2009, which it later spun-off as a private business in 2014. For its part, Monsanto purchased The Climate Corporation in 2013, a weather insurance underwriter, and is now planning to develop index insurance products for Indian and South American farmers (Gilbert, 2014).

Possibilities and limitations

Despite the widespread enthusiasm for IBAI, results from many projects have been disappointing. To be sure, some programs have generated real benefits. An index insurance program administered by Oxfam and funded by Swiss Re and the Rockefeller Foundation, for instance, was found to improve the resilience of Ethiopian cereal farmers to drought, albeit in a palliative—rather than transformative—manner (Madajewicz, Tsegay, & Norton, 2013). Yet for many programs, farmer participation has been disappointingly low, at least from the perspective of promoters and providers (Da Costa, 2013; Gehrke, 2014). A handful of studies have speculated upon the reasons for the low uptake rate. Former World Bank economist Hans Binswanger-Mkhize (2012) has argued that well-off farmers are unlikely to purchase index insurance since they have sufficient social and economic resources to self-insure, while poorer farmers are unable to buy in since they lack the resources to do so. Consequently, he maintains, index insurance does little to benefit those in need. In India, lagging demand has been attributed to the financial ignorance of small-scale farmers, so insurance brokers and other actors who stand to benefit from the marketization of risk management have engaged in far-reaching discursive and pedagogical interventions aimed at teaching farmers the "rationality" of insurance and "structurally adjusting culture," all with the aim of creating effective demand (Da Costa, 2013). Yet the fact that such rationalities are still not forthcoming suggests that the small-scale farmers who are the target of IBAI initiatives may have suspicions about the commodification of risk management and its disembedding from existing socio-ecological contexts.

Indeed, while the challenges associated with the implementation of IBAI raise important questions, so does the impact of such initiatives upon farmer vulnerability. How does the adoption of index insurance reshape farmers' agricultural practices and risk-management strategies? Rather than reducing small-farmer vulnerability, might the use of finance-based products like IBAI exacerbate it? There are at least two reasons that it might.

First, IBAI is championed as a means for modernizing—and thereby simplifying—the agricultural practices of small-scale peasant farmers. Small-scale farmers operating on the

margins have long shown reluctance to adopt modern agricultural technologies since, among other reasons, the certainty offered by diversity management and other "traditional" practices has outweighed the *potential* of increased yield/income but also of catastrophic failure (Lipton, 1968). Proponents maintain that index insurance will enable subsistence-oriented farmers to forgo such "risk rationing" and to improve the efficiency of their operations. They suggest that it will also make farmers more credit-worthy, allowing them to acquire loans for the purchase of modern inputs and become more fully integrated into global agrifood value chains (Skees & Barnett, 2006; World Bank, 2011). However, modern seed varieties and commercial crops are often less resilient than locally derived seeds and plants and more susceptible to environmental hazards. Moreover, even if index insurance decreases the risk of financial loss from weather-related events, the modernization envisioned by its proponents would likely increase farmers' exposure to market risk. That is, decreased environmental risks might be accompanied by increased economic risks. Index insurance does nothing to protect farmers from rising input costs or volatile output costs. Nor does it guarantee that the price of insurance premiums will not rise over time. Indeed, premiums are likely to increase in tandem with the probability of weather-related hazards, meaning that once farmers have adopted modern practices under the protections offered by index insurance, they may find that they can no longer afford such protections when they most need them (Johnson, 2013; Peterson, 2012).

Second, the adoption of index insurance could also exacerbate farmers' vulnerability by transforming the social means for managing risks. While moral economies may not be as vibrant as they once were, informal practices for pooling risk across households and over time are still prevalent in many agrarian societies. Oftentimes, these practices are tied to the cultivation of local staples that have little value in national and/or global markets. Adopting modern seeds or commercial crops may preclude farmers from participating in such arrangements. Additionally, the market relations that govern index insurance are ambivalent to the plights of farmers and lack the guarantees of informal social insurance arrangements that are patterned upon reciprocity and redistribution. Market institutions do not require sellers to feel compassion for buyers. By their very nature, they foster indifference (Bowles, 1998; Polanyi, 1958).

In short, low uptake rates suggest that the recent explosion of index insurance programs has done little to mitigate the increased vulnerability faced by farmers who have lost state-backed social protections. The handful of farmers who purchase index insurance may find that the financial product mitigates some climate-related risks even as it increases exposure to different economic and environmental stressors. On the balance, however, participating farmers may be more vulnerable than before. This leads one to question whether there might be a better alternative to help farmers cope with their double exposure to climate change and globalized and corporate-dominated agrifood markets.

An obvious—but only partial—solution would be to resurrect the commodity boards, trade protections, and other state guarantees that prevailed in many countries prior to the roll-backs of neoliberal restructuring. At the very least, such changes would create a more predictable and supportive economic context. Yet in the past, many of these policies supported the adoption

of Green Revolution agricultural practices that increased yields in the short-run but ultimately undermined the productive base of agriculture and fostered a simplified agricultural landscape that is more susceptible to natural hazards (Taylor, 2015). Protecting farmers against the risks of climate change and other weather related events will require the (re)introduction of agro-ecological practices like matching cropping patterns to the qualities of the local landscape, diversifying crop species and varieties, and minimizing the use of agro-chemicals. Such practices have been empirically linked to the greater resilience of agro-ecosystems and agrarian livelihoods in the face of hurricanes and other environmental hazards (Holt-Giménez, 2002; Lin, 2007; Rossett et al., 2011). Agro-ecology is dynamic. It appreciates and integrates the knowledges that agricultural producers have developed through their intimate interaction with place-specific natural processes over time and it encourages the sharing and adaptation of those knowledges across space (Friedmann, this issue). Moreover, given that agro-ecology emphasizes the use of on-farm resources, it also promises to reduce farmer debt, thereby contributing to the financial liberation of agricultural producers and enhancing their overall sovereignty (Akram-Lodhi, this issue; Snipstal, this issue).

Though many well-intentioned actors have promoted index insurance as a means for managing contemporary agricultural risks, its use may be counter-productive. In this article, I have suggested several reasons why this might be the case, but empirical research is necessary to address a number of unanswered questions. For example, how, in fact, does the expansion of index insurance impact informal risk sharing arrangements? By tying protections to the modernization and commercialization of farming, does it compromise the resiliency of agricultural practices and expose farmers to new risks? How might this have an impact on the overall vulnerability of small-scale farmers? Do agro-ecological practices represent a superior alternative? Can financial instruments complement rather than undermine existing risk management strategies? Answering these questions will help to elucidate whether index insurance can genuinely help farmers manage expanding climate risks or whether it is a misplaced and insufficient financial fix to deeper structural vulnerabilities.

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