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Fragile Transfers Index Insurance and the Global Circuits of Climate Risks in Senegal

Sara Angeli Aguiton

Abstract

In recent years, Senegal's developed a program of index insurance to cover farmers from economic losses due to drought. I investigate this emerging market in light of Jane Guyer's question: "What is a 'risk' as a transacted 'thing'?" To grasp the social practices required to make "rainfall deficit" a transferable risk, I explore the climate and market infrastructure that brings it into existence and follows actors who function as brokers allowing the risk to circulate from Senegalese fields to the global reinsurance industry. I show that the strategies set up to convince farmers to integrate a green and rational capitalist management of climate risks are very fragile, and the index insurance program only endures because it is embedded in the broader political economy of rural development based on debt and international aid.

Keywords

agriculture, climate risk, index insurance, international development aid, Senegal, infrastructure

Introduction: Tracing Transferable Climate Risks

"What is a 'risk' as a transacted 'thing'?" asks the anthropologist Jane Guyer (2009: 215). In this article, I make this question my own in order to explore the production of climatic risk in agriculture and to trace the transactions through which it circulates. I will do so by studying an emerging insurance market in Senegal, based on a technology called "index insurance." As defined by the World Bank, which propagates it globally, it is an "innovative approach to insurance provision that pays out benefits on the basis of a predetermined index (e.g. rainfall level) for loss of assets and investments, primarily working capital, resulting from weather and catastrophic events, without requiring the traditional services of insurance claims assessors. It also allows for the claims settlement processes to be quicker and more objective" (International Finance Corporation 2018). I will scrutinize the process of risk transfer, as the main goal of index insurance is to construct climate risk as a financial artifact able to circulate from a farmer to the global reinsurance industry.¹ Yet, risks do not circulate as manufactured products on an assembly line, and index insurance in Senegal requires various technologies and brokers to bring the risk of "rainfall deficit" (as the company puts it) from one counter to another. By investigating risk transfer as a social practice, I will show that these brokers are crucial to the economic and political transactions through which risk circulates, because they accompany the infrastructure actively producing climate risk.

The study of brokerage is central to political anthropology as well as to African studies. In order to capture the practical implementation of national public policies, international development projects, or market interventions, scholars have investigated the role of specific actors whose multipositionality (James 2011), skills (Blundo 1995), and ability to translate (Lewis and Mosse 2006) help institutions to implement their apparatus and access the population (Bierschenk et al. 2000). This perspective was particularly fruitful for studying rural Senegal, as intermediation is crucial for state and international development power (Blundo 1995). Interestingly, the concept of “broker” also refers to a profession in the insurance industry: that of placing a specific risk at a good price for the policyholder, and negotiating insurance contracts on his or her behalf for a commission. In this context too the broker acts as an intermediary who does not carry the risk at any point but facilitates its transfer thanks to his or her skill, background, or network, sometimes experiencing personally the difficulties and contradictions of a market-based regime of risk mitigation (Bähre 2012).

Yet, brokers are not the only ones making risks “transferable things.” While the anthropology of development literature generally investigates brokerage to show how the state, markets, or development aid are translated through (human) intermediation, I claim that brokers also act as “maintainers” (Denis 2018) of the insurance infrastructure, as they are constantly dealing with environmental, technological, financial, and bureaucratic interfaces of a supposedly automatic climate risk transfer scheme. The Senegalese agricultural insurance market indeed required several layouts to exist: the insurance company had to be created, its employees trained by development agencies and their partners; a network of rain gauges had to be installed to cover the zones of the country targeted by the program; the legal framework had to be reformed at the international level to authorize the commercialization of index insurance; and new tools had to be designed to calibrate the index for various crops, geographical zones, and insurance policies. This infrastructure was necessary to create simultaneously a drought risk in agriculture, and an insurance contract by which a farmer could transfer such risk to an insurer. Put differently, the climatic risk would have not existed under this form if it were not made insurable. It needs an infrastructure to define, objectivize, and value it economically, while the *raison d’être* of brokers is to ensure that risks circulate toward this infrastructure.

Although, as we will see, the insurance market is supported by powerful institutions, and maintained by multilevel brokerages and by a complex infrastructure, it is also very fragile, not properly established. Risks do not circulate smoothly. While exploring its implementation, I will document various trials met by index insurance, particularly at the two ends of the chain of risk transfer, as

brokers' activities are not enough to convince farmers to cede their risks, nor the reinsurers to buy them at a good price. Following how insurance promoters worked to overcome these fragilities, my main attention will be to demonstrate that, in order to be sustained as a market, index insurance ended up being embedded into two other established financial circuits: debt (microcredit and agricultural loans) and aid (international development institutions' support), which consequently contribute to its power.

In Senegal, 95 percent of the rural population (estimated at more than seven million in 2014) lives through agriculture, with most not having access to welfare services. In line with the recommendation of the World Bank, index insurance for rainfall deficit was set as a public-private partnership to offer protection to these populations. This mission was given to the *Compagnie Nationale d'Assurance Agricole du Sénégal* (the CNAAS), created in 2008, which benefits from the investment of the Senegalese state (36 percent) and private insurers. The CNAAS does not operate the index insurance product alone and delegates its management to a microinsurance startup called Planet Guarantee. I will call these two actors the “insurance tandem,” as Planet Guarantee acts as a representative for the CNAAS and as their intervention is paired up. They have built the index insurance scheme upon a rainfall index that uses meteorological data to assess the level of rainfall water where the field of the policyholder is located (remote sensing and rain gauges are the two main technologies used). ANACIM, the Senegalese meteorological agency, manages the rain gauge network and transfers the data to Planet Guarantee, which assesses the loss and pays the claim, based on a calculation taking into account seeds' rain sensitivity at various growing stages. This process is supposed to be automated so that, in theory, if the level of water recorded by the rain gauge is lower than the threshold set by the index for a given period, the CNAAS pays the claim to the policyholder, who does not need to certify the loss.

To keep the price low in order to achieve a rapid expansion of the market, the state subsidizes the premium paid by farmers (a cut of 50 percent), and index insurance benefits from an exoneration of taxation. Along with these supportive fiscal policies, the insurance program developed through a series of international development interventions. The World Bank led the first pilot project in the mid-2000s, followed by the USAID, the West African Development Bank, the World Food Program of the United Nations, the European Union, and the Canadian International Development Agency. These agencies—and not the Senegalese state—were the ones deciding on the localities and populations targeted by the pilots. Priority was given to the central zone of the country, the Siné Saloum and Tambacounda regions, where agriculture is rain-fed and where rainfall is the most variable.

Development agencies also selected the insured crops, which are groundnuts, rice, corn, millet, sorghum, and *niébé* (for each crop, every seed type is specified). Finally, development agencies have contributed to supply Senegalese institutions with the meteorological infrastructure required to produce the data (Angeli Aguiton n.d.).

The drought risk produced by this insurance apparatus is an artifact defined by various technologies, expectations, and conventions, and calls for a critical examination. These technological mediations produce risk, which ends up defined as the risk of rainfall deficit on specific crops and seeds, in specific zones covered by rain gauges, at specific scheduled phases of the rainy season.² The gap is huge between this abstraction and the variety of dangers (climatic or not) faced by farmers: drought, flooding, erosion, destruction by wild animals or livestock, pests and insects, seeds or inputs of poor quality, and so forth. This gap between real-world dangers on the one hand and insurable risks on the other suggests that risks are partial artifacts, produced by choices of the actors who have the power to shape them. This relates to Jane Guyer's Polanyian analysis of financial risk technologies, produced to be "disembedded" from a "shared social matrix, transformed to a definition, and linked to an insurance strategy in order to be revaluated for sale on the market" (2009: 215). Yet, as Guyer suggests, such an abstract scheme is destructive, as it has privatized and commodified previous modes of collective insurance, and it is also incapable of delivering fully its promise, as the self-regulating market is a (powerfully ordering) fiction. These tensions still have effects, such as the fact that when a risk is manufactured, so is a noninsurable surplus that will be at the expense of the farmer, because to be profitable the insurance needs to make some dangers insurable while not compensating others (Johnson 2013). Risks transferred through index insurance are thus a very small portion of the dangers that Senegalese farmers have to manage daily. Yet, to produce this partially insurable climate risk is a difficult enterprise: the CNAAS–Planet Guarantee tandem must convince farmers who are preoccupied by various threats that the (abstract) risk of rainfall deficit matters specifically. This requires important work of prescription and conviction, conducted in the field by brokers for risk circulation.

Convincing the Poor: At Last, One Risk Must Be Transferred

Madam A. is a project manager at the UN World Food Program (WFP); she is based in Dakar and specializes in insurance and risk transfer mechanisms. Today, she implements index insurance in the Tambacounda region (in eastern Senegal), but before joining the WFP in 2015, she worked for four years for Planet Guarantee when the index insurance program was being launched. In these two

organizations, Madam A. is in charge of marketing and reselling index insurance to the populations targeted by various development agencies (when she worked for Planet Guarantee), then later only by the WFP. The marketing she conducts is of a particular style: she reaches out to poor populations of farmers, who often do not pay for the insurance policy, but who have to behave as if they would, in order for the program to demonstrate to its international donors the possibility of a self-sustained market in the future. Such marketing relies on risk awareness, andragogy,³ and financial literacy much more than on a commercial approach. When she was working for Planet Guarantee, Madam A. introduced index insurance to commercial farmers with modest income, who intend to sell their produce (mostly groundnut, rice, and corn). These farmers live and work in Siné Saloum, the central region also called the “Groundnut Basin,” and are organized in cooperatives. Now that she works for the WFP, Madam A. targets a poorer population in the Tambacounda region. Here, farmers live through subsistence agriculture and are supervised by NGOs, not by farmers’ organizations. This does not make a big difference for the index insurance that Madam A. promotes. Yet the framework is different for development agencies: in the first case, insurance is framed as a tool of rural economic development, while in the second case, it is a tool of food security.

When working for Planet Guarantee, Madam A. developed a methodology to raise awareness about index insurance among farmers. Her strategy for entering the field was to use farmers’ organizations as a channel, because they hold a strong power of influence and control over farmers. This approach is particularly interesting for the insurance tandem because the range of farmers’ organizations depend on productive sectors. This organizational feature fits well with the design of index insurance, calibrated on specific crops (maize, rice, groundnuts, sorghum, millet, etc.). Thus, to sell an index insurance policy for groundnuts (which was the first program set up by the World Bank), Madam A. worked with the Cadre de Concertation des Producteurs d’Arachide (CCPA, the groundnut producers’ union). Then, she replicated this partnership with the maize, rice, millet, and sorghum producers.

We have gone from talks, meetings in villages or with groups of villages; to training. So, talks, training for peasant leaders, as well as every mode of communication via community radio, with a strong emphasis on choosing the good resource person who will host the radio programs, while ensuring that the targeted areas [farmers] are listening during the broadcast of the show. So, basically, we started from the existing resources, which we adapted to our real needs in terms of promoting and disseminating information on agricultural insurance.⁴

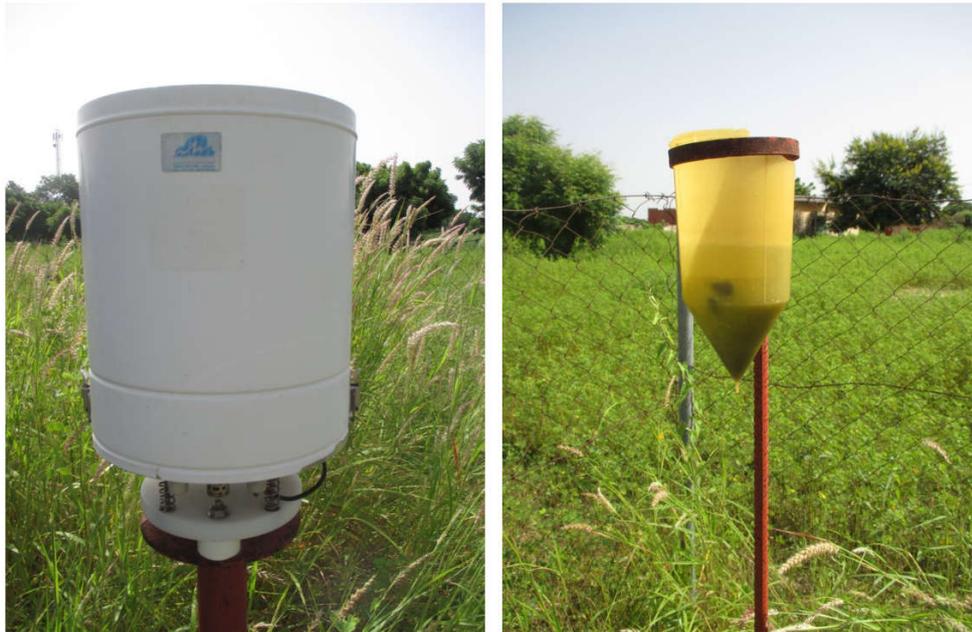
Conducting financial literacy in the field was necessary for the insurance tandem, yet it constituted an important financial investment. This campaign required Planet Guarantee to have agents in the field during the first year of the launch of index insurance for groundnuts (2011/12). This intermediation is expensive for the insurance tandem, which has to pay and train brokers, to develop marketing materials such as posters, handbooks in French and local languages (Serrer, Peul, Wolof, etc.), to organize training for a variety of partners, and so forth. A central aim of these training sessions was to introduce farmers to the notion of “insurable risk,” as well as to make them see the value of risk transfer mechanisms, to the extent that they would agree to pay an insurance premium.

The longest to explain . . . was the notion of “insurable risk.” Because for a producer, insurance means covering himself or herself against all possible risks, while index insurance covers a specific risk. The fact that insurance does not cover all the risks is often a problem for them: Why only the rainfall deficit? Why not the others? [Additionally,] the way insurance works is something new for them, you have to explain to them so that they understand, for example, that premium is not refunded even if there is no claim. Because, often, they ask you: In case there is no damage, are you going to give them the money back? [*She laughs*] That’s also something that took time to explain. But the notion of risk, and especially what is an insurable risk and what is not, and the fact that not all risks are taken into account by the insurance product, it really took time.⁵

Introducing insurance to farmers, explaining the mechanisms of premium, of claim and compensation, of basic risk,⁶ and building farmers’ confidence in rain gauges as technologies that would automatically trigger the claim were therefore Madam A.’s main missions. Building trust in the field is one of the most central issues of the first phase of deployment of the insurance pilot projects. The material presence of rain gauges in villages was strategic to demonstrate how index insurance works and to gain farmers’ trust. Madam A. made it a habit to mention rain gauges in her speeches in order to explain how the insurance works. By doing so, she substantiates an abstract risk of “rainfall deficit” by articulating it to the infrastructure materializing the recording of rainfall, while at the same time introducing a new technique of observation for rainfall, which was until then achieved in a more empirical way by farmers and rural organizations.

Yet, the CNAAS and Planet Guarantee were not comfortable drawing farmers’ attention to rain gauges, because they considered they needed to be protected *from* farmers, who were suspected of being able to cheat by tinkering with them (for example, by hanging a tarpaulin to mimic the effect of drought) or of breaking them, voluntarily or not.⁷ The insurance tandem wanted farmers to ignore

the location of rain gauges, to ensure their functioning and to be sure that none of these sensitive and expensive instruments were damaged.⁸ The way to answer this paradox (how to ensure the trust of farmers in the weather infrastructure when the insurer does not want them to approach it) was to distribute handcrafted rain gauges, cheap avatars of the automatic gauges of the insurer (Figures 1 and 2).



Figures 1 and 2: An automatic (left) and a handcrafted rain gauge (right), in the village of N'Doffane. (Pictures taken by the author on 5 October 2017.)

Financial literacy activities illustrate the work required to sell index insurance in Siné Saloum. This work is not about producing knowledge about climatic risks (an activity conducted in parallel by the insurance tandem, which I do not have the space to describe here); it is about convincing farmers of the interest of insurance. In her seminal study of the early developments of life insurance in the United States in the nineteenth century, Viviana Zelizer (1978) showed that the spread of life insurance was due to the new understandings of life's events diffused by insurers. This is true for death (in Zelizer's work), for occupational accidents (Ewald 1986), and, in the case of index insurance, for climatic risk. It consists of getting the farmers who have access to this new understanding of events (their risk) to agree to transfer it through a financial transaction (the payment of a premium)—financially supported by a state subsidy to make this acceptable. The challenge of financial literacy is to produce the condition of possibility of this inaugural risk transfer. Madam A. was the first broker in my story who enabled the larger infrastructure of insurance to work.

Disseminating Seeds and Risks: When the Agricultural Technician Becomes the Insurance Underwriter

The transfer of climatic risks from a farmer to an insurer does not only affect those two parties, but also the collectives that take part directly or indirectly in this transaction. Mister B. is another broker whose involvement illustrates how the insurance market's construction is built on previously "embedded" networks. He is an agricultural technician employed by the CCPA, the groundnut producers' union of eight thousand members from different regions of central Senegal (Kaolack, Kaffrine, Fatik, Tambacounda) and grouped locally in various Groupements Intervillageois de Producteurs d'Arachides (GIPA). Mister B. is based in Siné Saloum and works mainly in the CCPA offices in Kaolack.

Senegalese agriculture, like that of many other countries around the world, is closely supervised by farmers' organizations, but also by rural development NGOs and development agencies.⁹ These actors might have conflicting motives and visions, but they often prescribe agricultural practices: they organize markets, set productive norms, disseminate machines, materials, seeds, and know-how. In recent years, Mister B.—originally in charge of monitoring seeds' multiplication for the CCPA—has also taken on a more financial role. In addition to agronomic supervision, he manages CCPA members' loan requests to the Caisse Nationale du Crédit Agricole (a rural bank) and their subscription to index insurance.

The CCPA first signs a contract with Planet [Guarantee], and I'm the one in charge of the underwriting, at the GIPA level [farmers' groups at the scale of the villages]. I sign the contracts with the GIPA, which in turn will make an inventory of all the producers who have signed up. So, they do the inventory, and they get the full amount [of the premiums]. Then we sign it, and they come and deposit the money here [in the CCPA offices of Kaolack] and they get the receipt. That's how it works, I manage the underwriting... I am the one who manages the contracts, I am the one to whom are given all the documents... Then I put it on the reporting [sheet] and send it to Planet. Then, they send us a document saying, "You have to pay that amount of money for this type of insurance," and we send the money. And each time, Planet pays us the little bonus for doing this work.¹⁰

The fact that farmers' organizations play a commercial role in the distribution of financial services to farmers is not new. In Siné Saloum, dealers of agricultural inputs, of micro-credits and seasonal loans,¹¹ and now of insurance use farmers' organizations to reach their targets (Blundo 1995). It is their channel

to the market, as Madam A. told me in her interview. Farmers' organizations not only facilitate access to their members, but also act as sales representatives and underwriters, new missions that they carry out for a fee paid by the insurance company.

From the CCPA's offices in Kaolack, Mister B. codes insurance contracts, paperwork usually carried out by insurance companies. He merges information collected by other technicians among farmers to launch subscriptions. On his computer, he fills in sheets with the name of the producer, his or her age, his or her sex, his or her telephone number, the name of the producer's village, the name of the location where the rain gauge reference is installed, total agricultural area, total insured area, the operating account,¹² and importantly, the mode of payment of the premium: is it prefunded by a bank credit, by a development aid project, or by the farmer's own resources?

Mister B. also monitors compensation because, as a broker for the CCPA, he has to redistribute the claims from the insurer to farmers. Annual general meetings of the organization are often the opportunity to do so. What he calls a "ceremony" is organized for check remittance—in which the insurance tandem and development aid donors also participate. A collective picture in front of a giant check is sometimes taken, to prove to farmers that risk transfer pays and to show international donors that the program is worth funding.

Index insurance is progressively being normalized through these practices. In the meantime, since the CCPA became a broker, it has become more embedded in the insurance scheme, as the farmers' organizations decide to make it compulsory for their members in charge of seed multiplication to subscribe to insurance. In other words, the CPPA made index insurance an internal tool to secure its seed production (which is considered the most strategic production), and so further strengthened its dual role as a farmers' organization and as a reseller of insurance. For the insurance tandem, this is a way to facilitate the acceptance of insurance by farmers because farmers' organizations have authority over agricultural practices; but it is also a way for the insurer to use farmers' organizations' labor force to sell and manage subscriptions without having to send employees into the field to perform this task. Marketing employees paid by the insurance tandem (such as Madam A.) intervene upstream, at the time of market launch. When a routine is settled (i.e., when new brokers are formed and partnerships stabilized), insurers leave the field and delegate to farmers' organizations the daily work that the circulation of risks requires.

Convincing the Wealthy: The Fragile Reinsurance of Senegalese Agricultural Risks

In the circulation of drought risks, outreach activities are not only carried out to convince farmers to cede their risk to the insurer. Once the insurance tandem has managed to collect the risks of Siné Saloum farmers, it must be able to transfer them to the financially powerful reinsurance industry, which sells insurance to insurance companies to help them stay solvent in case of a major loss.

Mister C. is the director of the African office of Planet Guarantee, based in Dakar, in charge of managing the index insurance portfolio for the Senegalese agricultural insurance company, the CNAAS. To understand the role of the startup as a broker in risk transfer, I must say a word about how an assurer assesses risks. In broad terms, the cost of an insurance policy as paid by the policyholder can be divided into three categories: the technical premium (an amount considered as capturing the “true” cost of risk), the reinsurance premium (what the insurer will have to pay to cede this risk to the reinsurer), and the insurer’s (and other intermediaries’) commission. In the insurance tandem, the CNAAS is the only insurer: it is the one that collect risks, that bear them financially and therefore retain the majority of the capital of the transaction (the technical premium, the reinsurance premium, and a small portion of the commission). However, because of a lack of internal resources, the CNAAS outsources most of its missions to Planet Guarantee, which ends up managing contracts, conducting agents’ training and financial literacy, carrying out actuarial work (recalculating the technical premium with new data), calibrating weather index, evaluating the claims, and negotiating reinsurance contracts. These processes manufacture both the climatic risk and its market price. Consequently, this calculation is fragile and often contested by the reinsurer, as Mister C. puts it:

Our job is to produce a technical premium... And we take it to the reinsurer, and the reinsurer recalculates it. And the reinsurer, he will not tell you, “I accept your calculation and your methodology, and I charge it with a 30 percent load and that’s your net reinsurance premium.” The reinsurer, he will not tell you that! He would rather say: “Okay, I have reviewed your risk and in fact your technical premium is not what you brought to me, it’s what you brought me plus x percent.” And, well, the gap between the technical premiums we calculate and the technical premiums that the reinsurance calculates, sometimes it’s 300 percent. You can send them something at 4 percent and they would say, “No, it’s 12 percent.” So, it was impossible for us to sustain our relationship with [he names a large European reinsurer].¹³

The problem encountered by Planet Guarantee with the European reinsurer mentioned by Mister C. in this vignette concerns the conflicting financial assessments about Senegalese agricultural risks. In reinsurance negotiations, everything is reviewed: meteorological data and the quality of the index, customers’ data, information on the financial solvency of the CNAAS, and so forth. *A rapport de force*

operates within risk calculation: the reinsurance company contests the insurer's risk assessment and requires reassessing the technical premium. In concrete terms, the risks ceded by Senegalese farmers are judged too high for the price offered by Planet Guarantee to the reinsurance company, which only accepts to buy them for a commission three times larger.

The problems raised by financial risk calculation do not only involve the pricing of farmers' risks. It also implies a financial valuation of the Senegalese insurer, which faces difficulty in bearing such risks. As would every insurance company, when the CNAAS agglomerates farmers' risks, it must retain a certain proportion of the risks in its books and cannot simply act as a broker between the policyholders and the reinsurer. As put by Mister D., a former Planet Guarantee employee:

The problem also affects local [African] insurers, which clearly do not have the capital to carry this type of risk, even the CNAAS here, and they are forced to reinsure almost all of it. Today, things are a little better, but beyond 20 percent of the risk [i.e., that the CNAAS could retain in its books], it gets complicated. At some point, risks weigh upon its capital and it can't carry too much.¹⁴

The Senegalese insurance company is statutorily required to embrace financial risk, to retain some risks in its books, and cannot simply make them circulate and charge a commission. As it is in the circulation of risks that insurance intermediaries derive both the most profit and the most security, consequently, problems start when risk transfer stops: then, insurance industry actors either reassess upward the prices of risks (as did the large European reinsurer mentioned by Mister D.) or struggle to bear them (as the CNAAS does).

How did the insurance tandem react to such challenges? The answer lies in the fact that index insurance is an "aid-dependent" commodity, relying both on Senegalese state subsidies and on international development agencies, which are able to exercise power on risks valuation and to intervene in the *rapport de force* between insurers and reinsurers. As reinsurers would not buy Senegalese agricultural risks, the World Bank had to step in, as Mister E., one of its financial experts, told me:

The terms that reinsurers would apply in mature markets, developed markets, are not the same as those they use in the [Senegalese] markets we are currently developing. [Reinsurers] are making a commercial effort, because we are working to create a market. Within this framework, the [World Bank's program] GIIF¹⁵ is putting resources on the table to support this market, resources to subsidize insurance premiums [for farmers]. But there are countries and contexts where we have also subsidized reinsurance premiums [paid by] insurers, with our partner reinsurers: Swiss Re, Africa Re, etc.¹⁶

Risk transfer needs a lubricant so that financial circulation can be achieved without too many problems. What the World Bank expert suggests in this quote is that, in addition to subsidies intended for farmers and for state fiscal support, the World Bank also had to subsidize the CNAAS, for the young company to be able to pay its reinsurance premiums. On the global market, Senegalese agricultural risks are far from circulating without the support of the World Bank: the requirements of financial actors are too high, their prices are too expensive, and they would have little interest in Senegalese drought risks, if it was not for the World Bank.

Embedding Climate Risks in Established Financial Circuits

Senegalese index insurance development is fraught with pitfalls, requiring aid at every step, to accompany risks in their transit from their site of production (a field in the Groundnut Basin nearby a rain gauge) to their final destination in the reinsurer's book. Although largely supported by various brokers, subsidized by the state and by development agencies, and after several years of pilot projects, the insurance tandem confronted another challenge: the insurance does not sell. In 2017, approximately 20,000 policies were subscribed—a figure too small for the insurance tandem to cover their costs, particularly considering the infrastructure and intermediaries to be financed. In other words, while a whole network of brokers is trying to get Senegalese farmers to cede their risks, they do not seem at all interested. The strategy adopted by the tandem to continue despite these challenges consisted of making insurance a tool for other economic dependencies. Mister F., employee at the CNAAS, narrates the shift in market construction that the insurance tandem had to engage:

[The previous approach was:] we would write to all the pilot projects in the southern zone, we would send an email asking them to identify... producers who would like to have insurance coverage. Then, they would give us a list of villages with potential subscribers... We realized with this approach that the potential we expected differed from reality. Development projects could give us a number of one thousand potential subscribers, but once in the field, after installing the rain gauge, we realize that instead of having one thousand subscriptions, we only had two hundred. So that's why the new approach, the one we're going to take from December, is that we are no longer going to write to these development projects, but we're going to write to microfinance institutions . . . So we're going to ask the area or villages where they sell the most loans, and we're going to work with the bank... And, in this case, the bank commits to prefinance the premium in the loans package. That's exactly what it is, that's the new approach we're going to have with this project. Canadians gave us two hundred rain gauges but they are waiting for results.

And if we continue at the same rate [as] our first years of implementation, we will not achieve the goals... so we're going to try to get it right for next year.¹⁷

Too fragile to convince farmers and to build a local market (most certainly because they are preoccupied by other dangers and have other ways to handle them), index insurance is gradually attached to bank loans. The new route with which Mister F. plans to channel index insurance aims to replace the distribution scheme involving Mister B. While the first option embedded index insurance in agricultural networks of influence and power, the second option relies on the pervasive power of banks to help insurance disseminate more efficiently. This new financial alliance makes index insurance a collateral for the loans subscribed by farmers (i.e., a financial guarantee helping them to repay their debt if drought affects their seasonal production). Reciprocally, the insurer hopes to get partnering banks to prefinance premiums (i.e., to lend slightly more capital than the amount requested by the farmer so that he or she will be able to pay the insurance premium), a new way to sustain a market on a drip. With this shift in strategy, CNAAS moves its infrastructure from financial literacy activities designed to tell farmers how to be good risk managers, to the embedding of index insurance in rural circuits of debt, making it a tool in micro-credits and loans that locally sell much more than insurance.

A second notable phenomenon in this shift is that this new market horizon is set by the Canadian International Development Agency, which paid for new rain gauges and “waits for results,” as Mister F. put it. Again, we see how development aid is the political economy that wraps around this emerging market. Global development runs from the goals and expectations attached to the insurance program, through the money used to subsidize premiums and fund the weather infrastructure, and it diffuses in the fields when brokers reach out for farmers. Development agencies also make a connection with global capital when negotiating the price of Senegalese agricultural risks with the reinsurance industry, and with the Senegalese state when building the legal infrastructure for this market.

Conclusion

In Senegal, as in other countries of the global South, index insurance is implemented as part of climate change adaptation tools for vulnerable populations (Johnson 2013). Thanks to its weather infrastructure, index insurance's promises lie in the automation of claim management, supposed to make it more efficient and trustworthy. Against this vision of risk transfer as a fluid and automated process, this article showed that index insurance desperately requires the work of various brokers to

have risks circulate and to construct the market. Along with the insurance infrastructure, brokers produce risks and convince farmers to cede them, carry out the bureaucratic paperwork required by risk transfer, and struggle over risk calculation with global financial actors. These brokers articulate two analytical conceptions of brokerage (as intermediaries both in the development sector and in the insurance industry) because they are facilitators of risk transfer in a political economy of development.

This makes index insurance a fragile risk technology, that is not sustainable without the help of many intermediaries. This is due to the nature of index insurance and the little interest shown by farmers for it, a challenge exacerbated by the pressure applied by global reinsurers. As the strategy developed by the insurance tandem to answer those challenges was to make drought insurance the tool of broader circuits of debt and of aid, it contributes to fuel both private capital and global development power in Senegal's rural economy. This also makes index insurance a new part in the machinery of climate adaptation policies, which Akiko Yamane described as “fit[ting] within and reinforc[ing] existing official narratives of social and spatial disadvantage [and socioeconomic power relations], rather than addressing new problems or dimensions that might emerge from the combined effects of changes in climate, political economy, and society” (2009: 2411).

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References

Angeli Aguiton, Sara. n.d. “Infrastructuring Environmental Intangible: The Materiality and Challenges of Index Insurance for Agriculture in Senegal.” Submitted to *Economy and Society*.

- Bähre, Erik. 2012. "The Janus Face of Insurance in South Africa: From Costs to Risk, from Networks to Bureaucracies." *Africa* 82 (1): 150–167. doi:10.1017/S0001972011000787.
- Bierschenk, Thomas, Jean-Pierre Chauveau, and Jean-Pierre Olivier de Sardan. 2000. *Courtiers en développement: Les villages africains en quête de projets* [Development brokers: African villages in search of projects]. Paris: Karthala.
- Blundo, Giorgio. 1995. "Les courtiers du développement en milieu rural sénégalais" [Development brokers in Senegalese rural areas]. *Cahiers d'études africaines* 35 (137): 73–99. <https://doi.org/10.3406/cea.1995.2024>.
- Denis, Jérôme. 2018. *Le travail invisible des données: Éléments pour une sociologie des infrastructure scripturales* [The invisible work of data : Elements for a sociology of scriptural infrastructures]. Paris: Presses des Mines.
- Ewald, François. 1986. *L'état providence* [The welfare state]. Paris: Grasset.
- Guyer, Jane. 2009. "Composites, Fictions, and Risk: Toward an Ethnography of Price." In *Market and Society: The Great Transformation Today*, ed. Chris Han and Keith Hart, 203–220. Cambridge: Cambridge University Press.
- International Finance Corporation (World Bank Group). 2018. "Global Index Insurance Facility." https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/financial+institutions/priorities/access_essential+financial+services/global+index+insurance+facility (accessed 29 January 2019).
- James, Deborah. 2011. "The Return of the Broker: Consensus, Hierarchy and Choice in South African Land Reform." *Journal of the Royal Anthropological Institute* 17 (2): 318–338. <https://doi.org/10.1111/j.1467-9655.2011.01682.x>.
- Johnson, Leigh. 2013. "Index Insurance and the Articulation of Risk-Bearing Subjects." *Environment and Planning A* 45 (11): 2663–2681. <https://doi.org/10.1068/a45695>.
- Lewis, David, and David Mosse. 2006. *Development Brokers and Translators: The Ethnography of Aid and Agencies*. Bloomfield, CT: Kumarian Press.
- Yamane, Akiko. 2009. "Climate Change and Hazardscape of Sri Lanka." *Environment and Planning A* 41 (10): 2396–2416. <https://doi.org/10.1068/a41213>.
- Zelizer, Viviana. 1978. "Human Values and the Market: The Case of Life Insurance and Death in 19th-Century America." *The American Journal of Sociology* 84 (3): 591–610. <https://doi.org/10.1086/226828>.

Notes

1. Reinsurers are large financial companies to which insurers transfer part of their risk portfolio in order to improve their solvency.
2. In this article, I am mostly interested in the insurance product based on rain gauges' data.
3. The Oxford English Dictionary defines "andragogy" as "methods and principles used in adult education." <https://en.oxforddictionaries.com/definition/andragogy> (accessed 29 January 2019).

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4. Interview with Madam A., 2 October 2017, Dakar. In each quote, additional remarks or precisions from the author are in square brackets.
 5. Interview with Madam A., 2 October 2017, Dakar.
 6. The “basic risk” refers to the possibility that the index might not be sufficiently correlated to the risk, or that the threshold is not well calibrated. In index insurance, one speaks about the basic risk when a loss is suffered and not compensated by the insurer because the meteorological device did not trigger.
 7. Nobody I interviewed (or spoke informally with) ever mentioned that such sabotage actually happened, but everyone I discussed this issue with mentioned the fact that it needed to be prevented.
 8. The prices that were given to me by an employee of Planet Guarantee were CFAF 10,000 (EUR 15) for the handcrafted rain gauge, while the price of a GPRS rain gauge was estimated at CFAF 1–2 million (EUR 1,500–3,000).
 9. I do not mean that these organizations exert the same power, but that they contribute to various forms and networks of influence and control.
 10. Interview with Mister B., 5 October 2017, Kaolack.
 11. A seasonal loan (*crédit de campagne* in French) is a loan dedicated for a business run on seasonal activity, when the need for cash is important.
 12. An accounting category by which one measures the result of the production of a farm.
 13. Interview with Mister C., 23 September 2017, Dakar.
 14. Interview with Mister D., 11 October 2017, Dakar.
 15. GIIF stands for Global Index Insurance Facility, a World Bank program designed to diffuse private insurance solutions in Africa, Asia, Latin America, and the Caribbean. Its main funders are the European Union and the governments of Germany, Japan, and the Netherlands.
 16. Interview with Mister E., 29 September 2018, Dakar.
 17. Interview with Mister F., 19 October 2017, Dakar.