Claiming crisis: an ethnography on agricultural insurance, rural distress and the everyday moralities of quantification in India

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Chapter 1: Agricultural insurance as a moral technology for the Indian rural poor

In this chapter, I examine the relationships between agricultural insurance and notions of rural distress in India. While in contemporary insurance literature this link is often presented as taken-for-granted, I show that this relationship had a very particular emergence. In the first part of this chapter my assertion is that, over time, agricultural distress has become strongly associated with macrostructural forces and objectified risk categories. Simultaneously, starting from the 20th century, an idea gathered momentum in India that these macrostructural forces could be brought under control through the financial technology of insurance. Through actuarial and statistical science, accompanied by increasingly sophisticated measuring techniques, policymakers and academics deemed crop insurance technologically capable of managing specific agricultural risks and, moreover, imagined doing so in a fair and equitable manner. I will show how these two developments emerged side by side, and how technocratic governance of insurance related to wider moral concerns about agriculture in India. More specifically, I show the ways in which the moral objective of protecting 'the rural poor' has come to be associated with financial technology in the form of insurance.

Methodologically, the first subsection focusses on the analysis of insurance literature over time. I venture beyond the insurance narrative to provide context where it is vital to understanding the historical moments and shifts in paradigm that I describe. This is primarily a practical choice; the topic of rural suffering in India is vast and varied, meaning that any comprehensive study on the topic would quickly become unmanageable. Also, by staying close to the self-representation of insurance companies, I tease out how the insurance logic emerged alongside the objectification of agricultural crisis and show how insurance companies in India have been actively complicit in this emergence. This lays the groundwork for an understanding of insurance that I will draw on in later chapters.

The second subsection will zoom in on the promise of insurance to achieve fairness through quantification. Here, I suggest two things. One observation by scholars is that insurance companies are playing an increasingly influential role in defining the boundaries of what are considered agricultural and ecological facts (Weinkle and Pielke 2017, 565). Through measuring disastrous events as a group by statistical means and relating this to a temporal continuity, climactic risks become visible and gradual change can be apprehended as fact (Lehtonen 2017, 34, 45). By surveying methodology and

statistical science, the agricultural crisis emerges as simultaneously encompassing ecological and moral aspects. Insurance is progressively assuming a greater role within this development as it forms the institutional framework in which these technological tools are deployed. Secondly, I will argue that the link between calculation and fairness underpins the entirety of insurance in the form of actuarial pricing. Here, the assumption of insurance professionals is that fairness is the outcome of proper equations and data. Numbers, their gathering and calculation, offer legitimacy and moral justification to insurance as a vehicle for redistribution. To make these points, the second subsection details the technicalities of the current insurance scheme to show how insurance produces a specific set of risks, which qualify to be quantified. Furthermore, insurance companies operate on the premise that mathematically sound pricing based in accurate data is the preferred method for achieving fairness. However, my fieldwork shows that, in practice, this means that there is often a discrepancy between the index calculated by the insurance company and what is experienced by farmers in their fields. The reason this aspect of the insurance scheme gets attention is because this tension between the quantified models produced by insurance companies and the lived experience of farmers is a central tension, which will be relevant at different points throughout the dissertation.

INSURANCE, FAMINE AND MODERNISM

> It is difficult to realise what an effective system of Agricultural Insurance in an Indian state would really mean. […] It would bring about nothing short of a great revolution in the economic life of the peasantry. It would remove the element of uncertainty which annually sits as a nightmare on economic progress and on public finance. The introduction of Agri-cultural Insurance would mean the application of the steadying forces of a valuable remedy to the most vital part of the country's economic system which is perpetually threatened and occasionally dislocated by an affliction of the severest character. The success of such a scheme would be a glorious triumph of scientific study and economic organisation in solving one of the most momentous problems of all ages and of all countries.
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> - J.S. Chakravarti (1920)

The story of agricultural insurance is, in many ways, an Indian story, as it is in India that the promise of insurance for farmers has historically been embraced most ardently. J.S. Chakravarti, a government official working for the princely state of Mysore, is widely credited with spearheading the idea of insurance for farmers. In his book, aptly named *Agricultural Insurance: A Practical Scheme suited to Indian Conditions,* he makes a case for the necessity of agricultural insurance and then goes

on to show in remarkable detail how such a system could operate. The lines quoted above come from the introduction of this pioneering book. In it, the author enthusiastically and confidently lays out the rational promise of an insurance scheme, which, in his estimation, would bring about a considerable transformation in farmers' lives. While the particular technical approach to crop insurance would change over the years, as I will show later, the basic goal would remain remarkably similar to what Chakravarti set out at the turn of the 20th century: alleviating the suffering of rural populations using modern scientific methods and rational financial calculation.

The insurance scheme Chakravarti suggests in subsequent pages is both straightforward and innovative. The book describes the practicalities of rainfall insurance. Rainfall insurance is a form of index insurance that uses a proxy, in this case inches of rainfall in a particular area, to make estimations about the extent of the damages to crops in that area. The assumption is that a lack of rain affects everyone and therefore the proxy can be universally applied to the whole area. Chakravarti recognises that, in order for this to work, data collection of these rainfalls statistics must be precise and comprehensive, and remain so over time. Consequently, he spends most of the book describing and explaining how data gathering would take place, how it would be stored and how damages to crops would then be calculated. The book is full of tables, datasets and considerations of the best way to capture rainfall data, all meant to obtain an accurate image of the rainfall in a particular area, which can function as the basis for a payout from the insurance company.

Chakravarti's work had considerable urgency at the time of writing. In the years prior to publication, there had been frequent crop failures and severe famines in India, which were extremely disruptive to social life in the country, not to mention deadly. Between 1870 and 1920, no less than nine major famines occurred in West India of which the famine of 1899–1900 alone killed close to a million people from starvation while many others were left in situations of extreme poverty. This was a problem that was contemporary to Chakravarti; the agricultural year of 1919–1920, the year in which he published his study, had seen a famine occur in Mysore and the Bombay presidency, which has been estimated to have affected close to 60 per cent of the population and killed tens of thousands (McAlpin 1979, 145–146). The dislocating affliction Chakravarti mentions in the first pages of his introduction refers to these famines. While he avoids direct reference to famine in the first lines of the introduction, he later addresses the topic explicitly, writing:

> Agricultural Insurance in India will be a valuable kind of famine insurance. It would not indeed render unnecessary the provision which a state in India should make and the responsibility which it should assume for preventing death by starvation in times of

> agricultural distress. Such provision must continue to be made and such responsibility on the part of the state must continue. But, under the present circum-stances, a famine in India does not generally mean grain-famine but money-famine. Insurance, therefore, by insuring the peasantry against serious pecuniary loss in respect of agricultural operations will render the country less liable to the ravages of famine (Chakravarti 1920, 3–4).

What can be seen from the lines above is that Chakravarti clearly sees a role for insurance to aid in times of 'agricultural distress.' While he warns against seeing insurance as a substitute for government relief, he does envisage insurance to help smooth over monetary loss after a bad harvest year. What is key to understanding the significance of this quote in the context of the times is that he envisions this aid to be preventive and *ex-ante*. This idea, that misfortune could be anticipated and quantified, and managed before disaster strikes, departs from the 'state provisions' he mentions in the quote. This refers to the now-famous Famine Codes of 1880, a series of reactive alleviation efforts, which were to be put in effect when a famine had already broken out. What we see here is an early attempt to transform the exceptional, 'natural' misfortune of dearth and famine into a statistically 'normal' and manageable risk. Central to this understanding is that scientific methods and financial technology are imagined to offer a way to measure the regularity of bad harvests. Chakravarti mentions this throughout the book. He goes to great lengths to argue that accurate rainfall and yield statistics are necessary to make the insurance scheme financially sustainable, writing for instance that: "The calculations relating to the agricultural insurance scheme are all based on the average number of droughts occurring in a long series of years. […] On the whole after a sufficient number of years' a state of equilibrium might be reached" (1920, 154). This attitude betrays an important paradigmatic moment, as it posits that the extent and impact of rural suffering can be made numerically legible before it actually occurs.

François Ewald (2002) goes into the relevance of this shift in his study of 19th-century worker liability insurance in France. He argues that insurance, statistical methods and probability calculus are powerful tools that allow insurance companies to visualise incidences of misfortune as having a certain regularity over time, irrespective of individual conduct (see also Desrosières 1998). This is significant because, imagined in this way, misfortune 'normalises' as an inevitable outcome of economic activities, like factory work or farming. Simply put, accidents happen as a result of living life; every time someone picks up a tool or plants a crop misfortune may occur. The regular occurrence of these accidents can be measured by statistics and turned into percentages, which can then be insured by insurance companies. This transforms uncertainty into calculable risk as, seen from the perspective of insurance, "misfortune is not the exception but the rule" (Ewald 2002, 279). The logical conclusion

of this rationalised way of thinking, according to Ewald, is that the solution to misfortune becomes an economic question. It is not about who is to blame or whether something is an 'act of God,' but rather it is about accurate measurement and fair distribution of the costs of misfortune within society. This paradigmatic shift also means that risk is now ultimately situated in social relationships; drought becomes a societal problem, which can be dealt with collectively through science and technology rather than an exceptional, natural one, which can only be responded to reactively. In a sense, through works like that of Chakravarti, the idea of insurance as a solution for social issues emerges and, simultaneously, the stage is set for its relevance.

This focus on financial technology, surveying techniques and rigorous scientific rationalism became the hallmark of future agricultural insurance schemes. Not only was it important to the operating of insurance from a practical point of view, but, perhaps even more so, as an ideal type that was employed to shore up the moral legitimacy of the scheme. In any case, the rational promise of insurance would embed itself firmly in future contributions on the topic. This is not to say that, at the time, everyone was equally thrilled at the prospect of attaching percentages to suffering in such a straightforward way. Chakravarti mentions something that we will also encounter in Chapter 2; comparisons of insurance to gambling. These allegations were apparently frequent enough that the book is at pains to dispel the notion that insurance becomes a way to gamble on the rains. It is noticeable how he uses the rationality of calculation as a basis for his argument. This optimism vis-à-vis science and (financial) technology is palpable throughout the book. Apart from the "glorious triumph of scientific study and economic organisation" mentioned in the first pages of the introduction, Chakravarti places great trust in the powers of economics, meteorology and statistics to visualise and transfer risk. He writes:

> Many writers have regarded all insurance as a form of gambling. No sadder mistake was ever committed by scientific writers and no worse confusion made between one of the greatest of economic blessings and one of the worst forms of human vice. […] If an insurer made a contract with a person having no agricultural interest or other interest connected with rainfall to pay him a certain amount if the rainfall did not amount to a certain number of inches' before a certain date or hour, that would be gambling, because it would involve the creation of some risk which did not exist. But if an agriculturist, who expects a fairly definite out-turn from his fields in the ordinary course in a season of normal rainfall, feels the uncertainty of the rainfall of individual years as an economic disadvantage and embarrassment, and if an insurer agrees to relieve him of this uncertainty by a scientific application of the laws of risk-transfer, then the case is one of legitimate insurance […] (Chakravarti 1920, 17–18).

In this example, Chakravarti lays out his belief in the objectivity of risk and the rationality of insurance. This centrality of risk and its relationship to insurance is very clearly when he talks of, for instance, the scientific application of the laws of risk transfer. It is tempting to make a comparison with the case set out by Ewald. Chakravarti uses statistical language such as the "ordinary course in a season" and "normal rainfall" in reference to weather events, concepts that rely on an established statistical paradigm as well as an objectification of weather risk. Furthermore, in contrasting gambling to the legitimate transfer of risk by way of insurance, Chakravarti acknowledges that such 'normal' risk is part and parcel of agricultural production.

Moreover, the quote reveals a moral side to the debate on calculation of misfortune, as some attitudes to risk are denounced while others are embraced. Interestingly, such objections to insurance can be compared to what Zelizer (1979) describes in reference to the mid-19th-century life insurance business in the United States. She shows how the emergence of life insurance as a way to attach a monetary equivalent to human life was – at conception – a contentious issue. It was deemed immoral to gamble on life in such a profane way and it took considerable time and effort on the part of insurance companies to transform these initial moral apprehensions. Over time, however, the immoral connotations of life insurance made way for the idea that life insurance was actually a morally responsible way to manage the risks associated with life and to take care of loved ones. A similar dynamic can be seen at work here. Chakravarti deals with it in almost every chapter, steadfastly dispelling notions that insurance is a form gambling. Not only is gambling considered a 'vice' in its own right, but, by extension, betting on the rains without having something to lose if they fail is seen as deplorable, as it necessarily involves the suffering of others (1920, 101–102). This will re-emerge as a contemporary contention among farmers in Chapter 2, but the discussion is evidently not new.

Anticlimactically, the insurance scheme that Chakravarti laid out would never be implemented. While it remains a trailblazing book, ultimately its impact turned out to be little more than an obscure footnote in later studies on the topic (Mishra 1995, A85). However, the book does starkly underline the ways in which the technological character of insurance is put at the service of a moral goal, and vice versa. What emerges from Chakravarti's work is a shift of both risk and responsibility. Risk is relegated to the confines of objectively measurable natural phenomena like rainfall. The justification of insurance is that it can measure and manage the risks associated with these climactic events in a fair and equitable way. This inherently implies a direct correlation between rainfall and the distress of farmers. Regardless of whether this is true, this conceptual move brings back the very complicated and contextual

phenomenon of famine and drought to an easily quantifiable metric: rainfall. All the risks that farmers are imagined to face are tied to this indicator; if this indicator can be managed efficiently the welfare of farmers can be enhanced. I will dwell further on this issue of the objectification of weather risk into universal indicators in the second paragraph, but for now it is worth bearing in mind that this notion of quantified climatic risk is something that would become entrenched in later agricultural insurance initiatives.

INSURANCE, WELFARE AND RURAL DEVELOPMENT

It would be another forty years before the question of crop insurance was taken up again in earnest in India. By that time, the last famine, the Bengal Famine of 1943, was firmly in the rear-view mirror. Moving away from its characterisation of famine insurance, the idea emerged that agricultural insurance could be a way for the government to extend financial services, development and welfare to the rural poor. In the first decades after independence, the Indian government saw an active role for itself in providing constructive policies and financial aid to cushion the dwindling landholdings and falling production of small-scale agriculture (Walker 2008, 579; Kalamkar 2011, 3). Agricultural insurance apparently offered an attractive proposition to lawmakers, as it was discussed immediately after independence in 1947. At the time, the idea was floated to bring all farmers under a nationwide subsidised insurance policy, which would protect them against bad harvests. However, the costs proved so prohibitive that it was quickly dismissed as impractical (Dandekar 1976, A61). Then, in 1956, the Nehru administration announced the nationalisation of the Indian insurance sector. The objective of targeting the rural poor through insurance was explicitly addressed during a speech announcing the nationalisation of the sector, during which it was stated that, “it will be possible to spread the message of insurance [...] into hitherto neglected, namely, rural places” (Sinha 2007, 649).

The narratives and policy surrounding these rural places and the people inhabiting them changed noticeably post-independence as well. This was the time of the famous ‘Green Revolution,’ which saw production of rice and wheat soar from the 1960s onwards, more than doubling the national farm income in the space of five years (Patel 2013). During this time, a host of government-driven measures were introduced, which included attempts to accelerate agricultural productivity through technological innovation, redistributing the available land, installing minimum crop prices and providing subsidised foodstuffs for the rural poor (Lerche 2011). Farmers, meanwhile, were increasingly incentivised to produce for the market by making use of pesticides, sowing high-yield varieties, taking institutional loans and buying artificial fertilisers. In

particular, wealthy land-owning farmers benefitted from these schemes (see Patel 2013, Walker 2008, Lerche 2011). This relatively new group of native capitalist farmers were able to better manage the changing circumstances and higher levels of uncertainty that accompanied this new mode of agriculture. They could diversify, buy the expensive inputs necessary and had enough land to benefit from the economies of scale that this new way of doing agriculture necessitated. They also tended to have the knowledge, connections and money to get access to government subsidies and aid (Patel 2013, 12–14, 19).

Crop insurance re-entered the stage in these agricultural circumstances as a way to facilitate this capitalist mode of production. Hazell (1986), the then head developmental economist at the World Bank, lays out how he saw the contemporary problems with agricultural uncertainty in India in the 1980s. He writes:

> [In India] Agricultural production is inherently a risky business. […] If a farmer knows that he will be financially compensated when his income is catastrophically low for reasons beyond his control, then he will be more likely to allocate resources in profit maximizing ways. For example, he will grow more of the most profitable crops even if they are more risky, and he will be more likely to adopt improved but uncertain technologies. The net effect could be an increase in value added from the agricultural sector, an increase in farm incomes and welfare, and a reduction in rural poverty (1986, 567–570).

The rural problems Hazell discusses have shifted noticeably away from preoccupations with famine. By referring to agriculture as a "risky business," he sketches an image of a farmer who is inextricably linked to financial and capitalist markets. This integration, Hazell suggests, makes agricultural production 'risky' but, if managed correctly, it may provide a way to profit and thus welfare for the rural poor and development of the agricultural sector. Crop insurance, meanwhile, is imagined as capable of protecting against these macrostructural forces; it can smooth over income and liberate the Indian farmer from the risk associated with agricultural production. Increasingly, what seems to be at stake is the business interests of these newly imagined capitalist farmers. Another influential World Bank economist summarises the intended effect of insurance on farmers nicely when he writes:

> The hope of proponents of agricultural insurance is to alter farmer behaviour in the face of risk in a variety of ways: towards more profitable cropping patterns that are less subsistence orientated, and towards increasing adoption of new technology, higher input use and greater farm investment, all tending to improve their welfare and national food security (Binswanger-Mkhize 2012, 188).

It seems that *homo economicus* has found his way to the Indian countryside and his need for crop insurance has been made evident, by insurance professionals at least.

In these circumstances, the Indian government made its first concerted effort to extend crop insurance to a considerable portion of India's farmers. The Comprehensive Crop Insurance Scheme (CCIS), later rebranded the National Agricultural Insurance Scheme (NAIS), was first introduced in 1985 and greatly expanded in scope in the early 1990s. At its height, it reached a significant 16 per cent of the total population of farmers (Raju and Chand 2008, 24). The stated goals of the scheme were, on the one hand, to "provide insurance and financial support to farmers in the event of crop failure as a result of natural calamities" and, on the other, "to encourage farmers to adopt progressive farming practices, high value inputs and improved technology in agriculture."[15] Furthermore, CCIS/NAIS was heavily subsidised, meaning that instead of paying actuarially calculated premiums, farmers paid a flat fee for inclusion into the scheme.

Technically, CCIS/NAIS was organised on the basis of a yield index called an 'area approach' in insurance jargon. V.M. Dandekar, a professor of sociology who first suggested yield index insurance on the basis of an area in an Indian context, discusses the benefits of this, writing:

> All the Area Approach needs is estimates of average annual yields of the crop over the whole area. These can be ascertained objectively from crop-cutting experiments. Being objectively determined, they are much less open to dispute and much less liable to moral hazards (Dandekar 1976, a78).

The area approach is therefore similar to rainfall insurance, but instead of measuring rainfall as a proxy for damages the average yield in an area stands in for the actual damages. Also similar to rainfall insurance is the stated advantage of this form of insurance. As Dandekar notes, the average yield is a relatively straightforward metric, which is amenable to 'objective' quantification through crop cutting experiments (CCEs). In practice, however, the area approach proved very labour intensive. To get an accurate database, a total of 500,000 of these experiments would have to be conducted in India each year. These CCEs entail harvesting a 10 x 10 metre plot of crops by hand, which has to be done by professionals trained in agricultural surveying and so the undertaking would be monumental. And, indeed, it proved difficult to coordinate and impossible to archive given the scant manpower available for the task (Ghosh and Yadav 2008, 158). Also, despite the optimism in the objective proceduralism in Dandekar's writing, those implementing the scheme acknowledge that field measurements open the procedure up to political pressure from people who would benefit from a lower estimate, like farmers organisations or panchayat

committees (Ibid.). Giving credence to these suspicions was the fact that CCIS/NAIS never reached a point where it was able to balance the premiums collected with the indemnities paid. The scheme routinely paid out five times what it collected in premiums and over the course of its existence never collected more than it paid out. Not only did it prove expensive to operate, the scheme was also widely believed by insurance experts to be fraught with corruption, coercion and fraud (Mosley and Krishnamurthy 1995; Nair 2010, 19). Given the fact that the scheme was to a significantly dependent on sale and assessments done by individual agents in their own localities, the fear was that the financial unsustainability of the scheme was caused, at least in part, by corrupt officials and fraudulent dealings between insurance agents and farmers (Mosley and Krishnamurthy 1995, 443). The unprofitability of CCIS/NAIS led to contributed to it being abandoned in the late 2000s.

CCIS/NAIS is often presented as a clear example of the failure of nationalised agricultural insurance. In particular, later proponents of private insurance point to this experiment as a failure of socialised insurance. It was, however, pioneering in its effort to protect millions of farmers in India from the growing uncertainties of modern agricultural production. At the time, it was by far the largest and most ambitious crop insurance programme in the world and, despite its financial woes, it reached a significant number of rural poor people. Arguably, its longevity and its scale foregrounded agricultural insurance in policy debates in India in the years that followed. Certainly, the fact that this insurance scheme proved unsustainable did not mean that the technomoral promise of insurance faded. The most enduring legacy of NAIS is that it instigated the comprehensive gathering of agricultural statistics in a way that did not previously exist. The Crop-Cutting Experiments would remain, and would have a profound impact on the way in which rural suffering would come to be calculated in subsequent years.

INSURANCE, CRISIS AND FARMER SUICIDE

As we have seen, large-scale social insurance programmes were the norm in Indian rural markets from independence until the late 90s. This changed in 1991 when the Indian economy was gradually opened up under the administration of Narasimha Rao (Assayag and Fuller 2005, 4). Proponents laud the reform for spurring the economic growth that has been the national norm since the policies were introduced (see Anklesaria Aiyar 2016). Critics, meanwhile, point to the fact that this economic upswing was unequally distributed in favour of the urban centres, while putting increased stress on the agricultural sector (Vaidyanathan 2006, 4009). They argue that integration into the world market, the rollback of the state's protectionist policies, decreases in

institutional credit for agriculture and land expropriation have not been beneficial for smallholder farmers (Walker 2008, 557; Reddy and Mishra 2012). Because farm income stagnated and landholdings decreased from 2.6 hectares in 1961 to 60 per cent of farmers holding less than 1 hectare in 2007, many farmers became increasingly dependent on high-yield cash crops and synthetic fertilisers to maintain the economic viability of their plots. This capitalist mode of agriculture further exacerbated the problems associated with the Green Revolution already outlined. For many, it meant exposure to the volatility of input and commodity prices as well as failing harvests, for which no centralised risk mitigation was in place. This intensification of small-scale agriculture led to increasing soil depletion and the lowering of water tables, which make agriculture increasingly precarious. These capricious circumstances, in turn, meant that farmers were more likely to be forced to sell assets or take on debt from private moneylenders demanding exorbitant interest rates (Walker 2008, 578–579).

Many have subsequently started to refer to this situation as an 'agrarian crisis' (Reddy and Mishra 2012; Deshpande and Arora 2010; Da Costa 2013; Shiva and Kunwar 2010; Sainath 1996). The pertinence of the crisis is further underlined by the many 'farmer's suicides,' which are seen to accompany these macrostructural changes. These deaths are seen as a direct outcome of the crisis and have become a much-debated issue in popular media, development literature, government circles and academic discourse. The blame for these suicides has been placed on a wide variety of possible culprits all associated with the 'crisis'; from genetically modified cotton (Shiva and Kunwar 2010), the collapse of traditional social structures (Mohanty 2005), to an intertwinement of global financial, ecological and social pressures (Gupta 2016). However, in general, the majority of the literature tends to support the idea that the prevailing distress and suicide rates can be attributed to the economic difficulties arising from crop failure and the resulting debt that this entails.

These enumerated cases of rural suicide are a powerful way to visualise the crisis. For instance, the scholar and frequent commenter on crisis Mohanty, asserts: "There can be no question that the current spate of farmer suicides in a number of Indian states is an accurate indicator of problems afflicting the rural economy and society" (Mohanty 2005, 243). Aside from a social tragedy, then, suicide statistics and the crisis for which they stand, have a powerful aesthetic (Douglas-Jones, Walford, and Seaver 2021, 17) as datapoints indicating a societal problem of enormous proportions. At the same time, critical literature has shown how these suicide statistics are constructions in themselves. For instance, in his study on a state-defined suicide hotspot in Kerala, Münster (2015) shows how the statistical representation of farmer suicide is a

construction maintained by NGOs and local governments who have financial interests in maintaining high levels of suicidal deaths (Ibid., 118).

It is in this environment of crisis, suicide and economic liberalisation that agricultural insurance again popped up as a means to mitigate the perceived macrostructural risks confronting farmers. From 2000 to the present day, advocates for insurance tend to invoke suicide as a central legitimation for insurance. For instance, an officer at the Agricultural Insurance Company, writes:

> Cases of agricultural suicides across the country do imply that risk mitigation measures currently in place have major shortcomings. Though farmer suicides can be attributed to a multitude of reasons, one cannot deny that a successful insurance programme would have greatly contributed in [sic] ameliorating the suffering of the farmers during crisis years (Nair 2010, 20).

Such statements clearly marry moral commitments to technocratic management. They bank on the argument that there is a moral duty to care for the vulnerable rural poor, who are committing suicide because of pressures associated with rural risk. Insurance, it is suggested, will be able to make good on this commitment by mobilising the rational machinery of finance and the monetary governance it represents.

Yet, instead of replicating its legacy as a form of social insurance, as with CCIS/Nais, agricultural insurance in the new millennium was re-imagined within the framework of the synchronously growing microfinance paradigm. Encouraged by organisations like the World Bank and the initial successes of Grameen Bank, in the late 2000s, 'financial inclusion' through microfinance became the new paradigm for poverty alleviation. Financial inclusion narratives envisioned poverty as the outcome of inadequate access to formal financial services (Schwittay 2011, 510; Kar 2013, 480). Thus, with the retreat of the state, a new host of development and private sector microfinance institutions (MFI) have come to be represented as the effective and fiscally sustainable alternative for poverty alleviation (Taylor 2011, 484; Schwittay 2014, 511). Agricultural insurance followed suit. A newly minted term, 'micro-insurance' became part of the repertoire to cover risks at the "bottom of the pyramid" [16] through products tailored specifically to the poor by privately held companies (e.g. Craig, Churchill and Matul 2012). Such micro-insurance, targeted at agriculture, emerged as a viable alternative to CCIS/NAIS in the years after its decline.

These agricultural micro-insurance policies drew lessons from the rainfall insurance scheme suggested by Chakravarti in the 1920s. However, whereas in the 1920s measurement was imagined to rely predominantly on rain gauges, by the 2000s the possibilities for applying advanced measuring technologies had expanded; weather satellites, automated weather stations, remote sensing and soil moisture

measurements were all proposed in order to acquire accurate data on natural phenomena tied to agricultural risk categories. The assumption that there is a strong correlation between farmer welfare and the index being measured, was by now an established axiom. The challenge to insurance companies, then, would be how to measure accurately and translate this into a fair price for those buying a policy. As the central unit of measurement, the index continued to appeal to insurance companies, as it simplifies complex risk into a single figure, whose variables could be controlled. As we shall see in the next subsection, such "cosmetic surgery on risk" (Da Costa 2013, 852) increasingly detaches technocratic notions of risk from actual damages experienced by farmers. The insurance business calls this discrepancy between the index and the actual situation 'basis' risk and sees is at as a necessary characteristic of these insurance products, meaning that this is a standard feature of the scheme. Weather insurance was ultimately destined for the same fate as its predecessors. Farmers refused to buy these products in the open market. Reasons cited for this are the complexity of the products as well as their poor availability and marketing, as well as the fact that farmers failed to see the logic of basis risk (see Da Costa 2013). However, as we shall see in the next subsection, the idea that an easily quantifiable index could stand in for damages would be at the centre of how insurance works in India today.

MAKING RISK: PMFBY, THE AREA APPROACH AND BASIS RISK

In 2016, the Indian government announced a new comprehensive crop insurance scheme called PMFBY or Pradhan Mantri Faisal Bima Yojana (Prime Minister's Crop Insurance Scheme). It would be the most ambitious insurance programme ever in India. It was open to all farmers, and mandatory for those taking institutional crop loans. In principle, it covered all crops against natural calamities during the summer and winter cropping seasons. In many ways, PMFBY abandons the experiments with a self-regulating insurance market for poor rural agriculturalists, as envisioned by the micro-insurance paradigm, and returns to large, socialised insurance schemes. Like NAIS, PMFBY is paid for largely by public funds. The premium paid by farmers is heavily subsidised, meaning that farmers pay only 2 per cent of the sum insured. Additionally, the scheme is marketed predominantly through state news outlets and the network of public sector banks that has proliferated under financial inclusion initiatives. Also like NAIS, PMFBY continues to be drawn to the allure of collective damage assessments to keep operational costs low. PMFBY, like its predecessor, operates on the basis of a yield index or area approach where, instead of individual farmers being insured, a predetermined number of sample cuttings stand in for the damages in an entire area.

These areas can be large and correspond roughly to the size of a *taluka*, which is an administrative unit best understood as a subcounty. *Taluka*s can vary in size considerably, but in Marathwada they typically include somewhere between 10 and 15 villages and towns of various sizes over an area of around 10 by 10 kilometres.

Also, like NAIS, PMFBY protects farmers against a predetermined, limited set of risks. The PMFBY operational guidelines explain that:

> The basic cover under the scheme covers the risk of loss of yield to standing crop (sowing to harvesting). This comprehensive risk insurance is provided to cover yield losses on an area based approach basis due to non-preventable risks like drought, dry spells, flood, inundation, wide spread pest and disease attack, landslides, natural fire due to lightening, storm, hailstorm, and cyclone (5).

These lines succinctly circumscribe the risks that are covered by PMFBY. They seem straightforward enough. PMFBY covers 'non-preventable' natural risks and does so on the basis of an area approach, i.e. not production risk or market risk.

What is different about PMFBY as compared to its predecessor is primarily its scale and centrality in Indian rural development policy. The Modi government introduced PMFBY as a 'flagship' scheme and it appears that the prime minister's reputation, at least in rural areas, is closely related to the success of crop insurance. This is evidenced by the heavy marketing from the government side in the first years of the scheme. This certainly had an effect; in the years after its introduction PFMBY was estimated to cover a large portion of the country's agriculturalists (Rai 2019). At the time, the scheme was marketed as an innovation. Supposedly, policymakers had looked at it and learned from the mistakes of previous attempts with crop insurance. At least the Cabinet, who approved the scheme, believed so, stating publicly that:

> The new Crop Insurance Scheme is in line with [the] One Nation – One Scheme theme. It incorporates the best features of all previous schemes and at the same time, all previous shortcomings/ weaknesses have been removed.[17]

While undoubtedly self-confident, the proclamation admits that the implementation of crop insurance had not been straightforward up until that point. Previous experiments with insurance had repeatedly run up against tenacious reality. Seeing the previous experiences described above, there are two predominant shortcoming or weaknesses to which this quote seems to refer. The first was that NAIS had relied on local bureaucrats to do the damage assessments in their own locale. As we have seen, this led to persistent suspicions of fraud, that there were inaccuracies in the calculations made and a likelihood that people would accept bribes in exchange for higher damage estimates. PMFBY would no longer rely on these locally embedded and usually largely untrained players to do crop measurements. Instead, it was

proposed that specialised agencies from the private sector would take over this work. The largest of these, Weather Risk Management Services, is a for-profit engineering and consulting firm that specialises in data science and which emphasises their calculative expertise. They state on their website that they:

> […] provide integrated risk management and regulatory services that help financial institutions, insurers, and corporates understand, quantify, and manage their risk associated with weather – earthquakes, hurricanes, floods, and other weather events – and crop yields.[18]

Accurate and disinterested calculation was to be one of the central tenets of the scheme and private sector companies were charged with the task of ensuring it. As we will see in more depth in Chapter 5, in practice this meant that a small army of young graduates would be hired locally to conduct damage assessments, called 'crop-cutting experiments,' according to stringent top-down procedures enforced by digital technology. These graduates were deemed less embedded in established local power relations than their government-employed counterparts and thus less susceptible to the kind of graft that observers suspected had plagued NAIS. Furthermore, WRMS added an app to the data control procedure where images had to be taken of the experiment in progress, the yield data gathered and the GPS location of the field. It was envisioned that the role of digital technology would be enhanced as the scheme matured to further diminish chances of arbitrary or inaccurate calculation. Yet, as I exited the field in late 2018 this still seemed a pipedream and most of the calculating was done by hand by the WRMS field staff.

The other major drawback that NAIS had struggled with was the fact that it was managed entirely by the public sector, which had led to spiralling costs and an increased burden on an already overburdened local government apparatus. The solution was to introduce private companies to the crop insurance market. The efficiency of the market, so the position went, would ensure the financial sustainability of the scheme by making sure that pricing reflected the risks involved. The government would subsidise the scheme, yes, but as a portion of the market rate of the premium. In practice, this meant that farmers paid only about one fifth of the premium that insurance companies charged, with the government making up the difference.[19] This shift seems innocuous, yet it brought about a significant conceptual change in the way morality and finance relate in the case of crop insurance in India. In fact, this invitation from the private insurance sector entrenched a paradigmatic shift, which will be at the centre of many discussions that feature in this dissertation: the belief that rational financial calculation can assure equitable and fair outcomes for those enrolled in the scheme.

Of course, we have seen this belief in quantification throughout the brief historical trajectory, which I have outlined above. For instance, it is palpable in the work of Chakravarti and "his glorious triumph of scientific study and economic organisation," and Dandekar's insistence on objective measurement based on averages, to ensure fairness. However, the private sector introduced the idea that insurance needs to be economically sustainable for it to achieve fairness. This way of thinking first appeared in India's agricultural insurance market with the micro-insurance policies marketed by microfinance institutions. Here, too, the products offered were tailored to cover risks proportionate to the relatively inexpensive products. Those designing PMFBY embraced this way of calculating fair pricing. The way in which the insurance industry typically achieves this is by calculating actuarial rates, meaning that they make financial products on the basis of premiums that are proportionate to the costs of operation plus the sum total of expected losses in a given year.

Fairness as understood by insurance logic really became a question of getting the numbers and equations right. As Landes (2014) convincingly shows, this belief in mathematical soundness is an important justification on which insurance companies base their claim to legitimacy and moral authority (Ibid., 521). Insurance companies call this guiding principle 'actuarial fairness.' Actuarial fairness represents the idea that premiums and payouts reflect the (collective) risks of those enrolled in the scheme. The fairness, Landes (2014) argues, plays out on two levels: 1) to make sure that insurance is economically efficient, that is, to ensure that the pricing for the insurance product is neither too high nor too low; and 2) moral, to make sure that everyone within the collective is treated equally, according to the risks they are exposed to (Ibid., 535). With PMFBY, actuarial pricing protects the solvency of the collectivity by calculating risk collectively and comparing it to historical average yields. It then passes the outcome of this calculation over to the collective in the form of actuarially fair pricing. As such, actuarial fairness is achieved by making sure that the 'actual risks' to the insured crops are taken into account and reimbursed on a collective level. To the insurance company, this is what makes it fair.

Meyers and Hoyweghen (2017) make the point that such a justification for actuarial fairness is seated in a neoclassical economic paradigm. They show that the basis for a 'fair' insurance product is predicated on a certain rendition of *homo economicus* as a rational utility maximiser, who always acts within established repertoires of rational action determined, in principle, within the confines of micro-economic models (Ibid., 421). This means that the 'fairness' of actuarial fairness is quintessentially a technomoral phenomenon; its morality is inextricably linked to mathematical models, which are calculated to be as efficient as possible. Put more simply, actuarial fairness

is an ideal where 'fair' pricing is efficiently calculated on the basis of well-established risks. The expectation from the side of this insurance is that this convinces people to take out an insurance policy, as it accurately covers their risk with a fairly calculated premium and payout (Ibid., 421–422). To quote Landes (2014): "the discussion about actuarial fairness is not only a discussion of the criteria for determining whether a cooperative arrangement is fair or not, but also a discussion of the right (moral) perspective from where to judge such an arrangement" (Ibid., 533).

CONCLUSION

In sum, crop insurance in India has a long history, which is inextricably linked to wider developments in rural India. While consistently plagued by setbacks and failure, the allure of insurance to curb the excesses of rural poverty and misfortune, whatever these excesses may look like, seems irresistible to Indian policymakers. The prospects of eradicating risk from India's largest economic sector by participation – and potentially running a profit while doing so – is alluring, even if the challenges of achieving it are large and numerous. As I have outlined in this chapter, insurance has had to reinvent itself multiple times throughout its life in India to deal with the problems of the era. I have argued in this chapter that every time it did so, the character of – and attitude towards – rural risk followed suit.

To do so, I sketched out a number of constitutive moments in the history of agricultural insurance in India. The overall aim of this historical trajectory has been to show how the problems associated with agricultural life in India have, over time, become increasingly associated with specific large-scale forces. Importantly, these large-scale forces are imagined to be controllable through quantification. Insurance thus emerges at different moments in time with the attractive prospect of expressing these macrostructural phenomena in terms of risk and making them manageable through financial calculation. Initially imagined as an innovative way to pre-emptively protect farmers against famine, it evolved into a more comprehensive form of financial governance aimed at enhancing farmer productivity and welfare in the years following independence. Later, agricultural reform and liberalisation introduced the kind of market logic that would further foster the technomoral promise of crop insurance. This promise, that surveying would produce an accurate, quantified representation of rural suffering, and that financial technology would be able to fairly price it, led to it being the solution of choice for the problem of crisis. While, in the end, all of these initiatives were unsuccessful or discontinued, they do point at important moments in which the moral and technological aspects of rural distress became intertwined through insurance.

I then moved to the most recent manifestation of agricultural insurance in India, where these same logics permeate and lead to new tensions. PMFBY was introduced as the logical descendant of NAIS and micro-insurance. PMFBY was to be a public-private partnership. It combined the power of social insurance and its capacity as a platform for centralised financial governance with the markets' preoccupation with economic efficiency. Most notably, it introduced the idea of financial sustainability, which was to be achieved through actuarial calculation and accurate surveying on an unprecedented scale. Private insurance companies and risk management experts were invited in to guarantee these standards of efficiency. The morality of crop insurance thus came to reside thoroughly in numbers and their operation in the form of data gathering and calculation; it underpinned the ideals, narratives and practices of insurance in a way that had a definitive effect on the manner in which the meanings associated with it at the everyday level took shape. This will be the topic of the next chapter.