



THINKING SUSTAINABILITY PRIZE

Author's Perspective

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Climate futures in agrarian India

Original Version

At the start of the 2019 monsoon season, Lokesh, a farmer in central India, took out a bank loan with his tractor serving as collateral. The loan was meant to pay back some of his family's existing debts, arising from expensive weddings and poor harvests caused by water scarcity. He hoped to return at least the interest through the new soybean crop, to be harvested in September, just a few months away. But heavy and continuous rainfall wreaked havoc in large parts of India, including in his fields in the Malwa region of western Madhya Pradesh. "Every year, my total yield is around 80-90 quintals of soyabean. This year, it is just 17 quintals." Lokesh kept 7 quintals of this for next year's sowing, selling the rest to a local trader. He used the earnings from the sale to make payments for pesticides, farm labor, and machine operators hired over the season. Repaying the debt would have to wait until the next harvest.

It is difficult to directly attribute this tumultuous monsoon season to climate change, even though we know that it is real and producing real impacts across the globe, including in places like Malwa. Incidents of extreme heat, erratic and unseasonal rainfall, and long dry spells are on the rise across India, with potentially devastating effects on its agricultural system, on which over half the population is dependent for their livelihoods.[\[i\]](#) In India, yields of staple food crops such as rice, wheat, and maize will be especially affected, impacting income, food, and nutritional security. A changing climate also increases pest attacks and disease, heightens livestock mortality rates, and causes serious health impacts from working outdoors.

But rural India is not a blank canvas upon which climate change suddenly and unexpectedly wreaks havoc – like all places, it too is shaped by history, culture, and power.[\[ii\]](#) We might begin with some sobering statistics. Over half of India's farmers are in debt, and for 85% of farmers, there are no savings in agriculture – that is, they make less than they spend on farming on average. Alongside, landholdings are small and fragmented with over 70 per cent of farmers classified as 'marginal', owning less than one hectare of land.

Malwa itself has long been integrated into global commodity networks through the cultivation of opium, cotton, sugarcane, and now soybean. More recently, its fields and farms have been dramatically transformed through new crops, inputs, technologies, and methods of cultivation. In central India, fields that were once a patchwork of sorghum, maize, lentils, cotton, and sugarcane are now a vast monoculture of soybean in the monsoon and wheat in

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the winter, made possible by pesticides, fertilizers, and private borewells.^[iii] The suite of technologies now associated with the Green Revolution - high-yielding varieties of seed, chemical inputs, private tube-wells – may have improved productivity and increased incomes, but this has come at a tremendous social and ecological cost – soil degradation, groundwater depletion, and widening social inequality.

Combined with declining state investment, rising costs of production, mounting debt, and stagnant prices, farmers like Lokesh face an unprecedented uphill battle not only against the elements but also against a system of production that feels less like a livelihood and more akin to a precarious gamble. The starkest manifestation of this crisis being the hundreds of thousands of farmers and farmworkers who have taken their lives since the 1990s. In other words, a changing climate arrives on an already degraded, unequal, and crisis-ridden landscape.^[iv]

This is not a wholly one-sided relationship. Climate change is not only impacting places like rural Malwa; climate change is also constituted by it. The nitrogen-based synthetic fertilizers that aid the cultivation of soy and wheat are almost entirely derived from fossil fuels. Much of the soy produced here is exported as soybean meal (animal feed) for the global meat industry, a key contributor to climate change. Agriculture comprises about 14 per cent of India's greenhouse gas emissions, primarily from livestock, rice cultivation, and synthetic fertilizers. Places like Malwa are also integrated – albeit unevenly – into the anthropogenic transformations of the planet's atmosphere.

Farmers in Malwa rarely speak in terms of 'climate change'. As an abstract planetary phenomenon, a shorthand for long-term shifts in temperature and weather patterns, 'climate change' does not always neatly translate into local, everyday experiences of the natural world. For many of India's agriculturalists, climate change is always perceived and experienced through already transforming socio-natures and economic structures. It *feels* like far more than just bad weather.

Spikes in temperature or even a decline in yields are abstract, quantitative measures which do not fully capture the social, economic, and psychological effects of climate change on growers' lives and livelihoods. For farmers, climate change is increasing spending on inputs, whether pesticides to combat new pests and disease or drilling new wells to chase drying, dwindling aquifers. It is the harvested produce rotting from unseasonal rain or extreme heat. It is the stress of mounting debts from the inability to pay back loans or the need to take on new ones. It is the erosion of social status from being unable to arrange a daughter's wedding.^[v] More viscerally, it is felt in the growling stomachs of children who are forced to skip meals. It is the dizziness, nausea, and exhaustion from laboring in the field amidst ever-rising temperatures.

Of course, although climate change impacts everyone, it does not impact everyone in the exact same way. In India, smallholders, Dalit (oppressed caste) and women farmers have small and less fertile landholdings with limited irrigation, deploy family labor in their fields, cannot afford expensive inputs, are often indebted to informal lenders at higher rates of interest, and lack access to crop insurance. In the wake of extreme weather, they are forced to take on more debt and additional wage labor. Wealthy, dominant caste agriculturalists, however, possess large landholdings, have more savings to withstand crop failures, and have diversified into non-farm trades and occupations which afford more secure and steady incomes. Enduring inequalities of class, caste, and gender make already marginalized communities far more vulnerable to the impacts of climate change.

Despite this, existing solutions promoted by the Indian state often fail to address the histories and inequalities shaping farmers' experiences of and adaptation to a shifting climate. Adaptation solutions – whether organic

farming or drip irrigation technology – ignore the significant barriers of access, including capital and knowledge that are vital to implementation and success. For example, water management solutions such as sprinkler systems and storage structures require significant investment which only a few can afford. Even government programs operate through subsidies, requiring farmers to make upfront payments for which they are reimbursed – in part – later. Without institutional support and resource redistribution, such adaptation strategies effectively exclude the most marginalized and vulnerable agriculturalists.^[vi]

Let us continue with the example of water management through drip and sprinkler systems, check dams, and farm ponds. Such technologies are certainly relevant. However, their adoption circumvents the deeper roots of the water crisis which lies not simply in erratic rainfall but in unsustainable and agro-ecologically unsuitable cropping patterns as well as unequal use and distribution of water among and between rural and urban populations.

Technological and financial solutions – drought-resilient seeds or crop insurance – may be necessary but are far from sufficient. At best, they can provide short-term fixes that offer temporary relief to some farmers. At worst, they can worsen inequalities, produce new dependencies, and deflect from more fundamental structural transformations to the existing input-intensive agricultural system.

As I discussed earlier, climate impacts are never experienced in isolation but always shaped by already existing inequalities and vulnerabilities.^[vii] Genuine climate solutions must address these pre-existing precarities. Too often, methods and technologies clubbed under the broad umbrella of ‘climate smart’ agriculture are simply modes of reproducing current models of production that are unsustainable and unequal. They are technical fixes that operate *as if* climate change – and the places and people it impacts – exist outside of history and power relations.

Several alternatives already exist at various scales. On the farm, they include inter-cropping, crop diversification, and indigenous seed varieties. At a regional and national scale, they could range from universal disaster relief and fixed agricultural prices to land redistribution, public irrigation infrastructures, and the fundamental right to food. At the broadest level, a truly ‘climate-wise’ - rather than climate-smart – approach must challenge the entrenched power of agri-business which exercise disproportionate control over research, inputs, and markets, and instead center the perspectives of the most vulnerable groups – smallholders, agricultural laborers, and women – on whose knowledge and labor the food system depends.^[viii]

Perhaps more fundamentally, there is the need to fundamentally reorient the dominant industrial-productivist imaginary of what agriculture is, what it is for, and what it could be. It cannot be viewed solely as a source of food or a business, wherein success is measured in terms of yields and profits. Agriculture (and attachments to the land more broadly) is a livelihood, a way of life, a system of knowledge, and a source of security and dignity. This is not to romanticize agrarian life – in rural Malwa, agriculture is marked by backbreaking labor and crushing inequality. Rather, it is to recognize that any effort to address the climate crisis must confront these asymmetries of power. Doing so is essential to building genuinely just and sustainable futures on the land.

^[i] India Development Review. 2025. The impact of climate change on agriculture: What we know. *IDR Online*. July 11. Available at: https://idronline.org/article/agriculture/the-impact-of-climate-change-on-agriculture-what-we-know/?gad_source=1&gad_campaignid=23276185193&gbraid=0AAAAADCoZDybetM9BUi8dBkOe0PeK13qJ&gclid=CjwKCAjwtcHPBhADEiWAWo3sJpkIh-0l3XGN3q4aSk14X6x-4oNJ4yApYa3IKfX8lkzSRw-ont0v1BoCrMAQAvD_BwE

^[ii] Ribot, J. 2014. “Cause and Response: Vulnerability and Climate in the Anthropocene.” *The Journal of Peasant*

Studies 41 (5): 667–705.

[iii] Kumar, Richa. 2016. *Rethinking Revolutions: Soya-Beans, Choupals, and the Changing Countryside in Central India*. New Delhi: Oxford University Press.

[iv] On the agrarian crisis, see Reddy, D. Narasimha Reddy, and Srijit Mishra, eds. 2009. *Agrarian Crisis in India*. New Delhi: Oxford University Press.

[v] Shah, Esha. 2012. “‘A Life Wasted Making Dust’: Affective Histories of Dearth, Death, Debt and Farmers’ Suicides in India.” *Journal of Peasant Studies* 39 (5): 1159–1179.

[vi] Taylor, Marcus, and Suhas Bhasme. 2021. “Between Deficit Rains and Surplus Populations: The Political Ecology of a Climate-Resilient Village in South India.” *Geoforum* 126: 431–440.

[vii] Matthan, Tanya. 2023. Beyond bad weather: climates of uncertainty in rural India. *The Journal of Peasant Studies*, 50(1), 114–135.

[viii] Taylor, Marcus. 2018. Climate-smart agriculture: what is it good for? *The Journal of Peasant Studies*, 45(1), 89–107.

