

Introduction

The Pradhan Mantri Fasal Bima Yojana (PMFBY), translated as Prime Minister's Crop Insurance Scheme, launched in 2016, is India's flagship crop insurance scheme operating under the "One Nation-One Scheme" framework. It replaced three previous programs like the National Agricultural Insurance Scheme (NAIS), Modified NAIS, and the Weather-based Crop Insurance Scheme consolidating their best features while addressing critical gaps.

Under PMFBY, farmers pay nominal premiums of 2% for kharif crops, 1.5% for rabi crops, and 5% for commercial and horticultural crops. The remaining actuarial premium (typically 95-98.5%) is shared equally between central and state governments, except in northeastern states, where the Centre bears 90% of the subsidy burden.

This analysis examines PMFBY adoption patterns across India's agro-climatic zones from 2018 to 2022, revealing a story about regional penetration rates.

Growth Across Agro-Climatic Zones

India's agricultural landscape divides into distinct agro-climatic zones shaped by rainfall patterns, soil types, and temperature variations. These environmental factors influence both crop vulnerability and insurance needs. The scheme is available to all farmers—including sharecroppers and tenant farmers—growing notified crops in designated areas, with loanee farmers automatically enrolled and non-loanee farmers able to voluntarily participate. PMFBY covers the entire cropping cycle from pre-sowing to post-harvest, protecting farmers against financial losses from prevented sowing due to insufficient rainfall, standing crop failure from droughts, floods, pests, diseases, landslides, hailstorms, and cyclones, post-harvest losses within two weeks of harvest from extreme weather, and localized calamities like cloudbursts and natural fires.

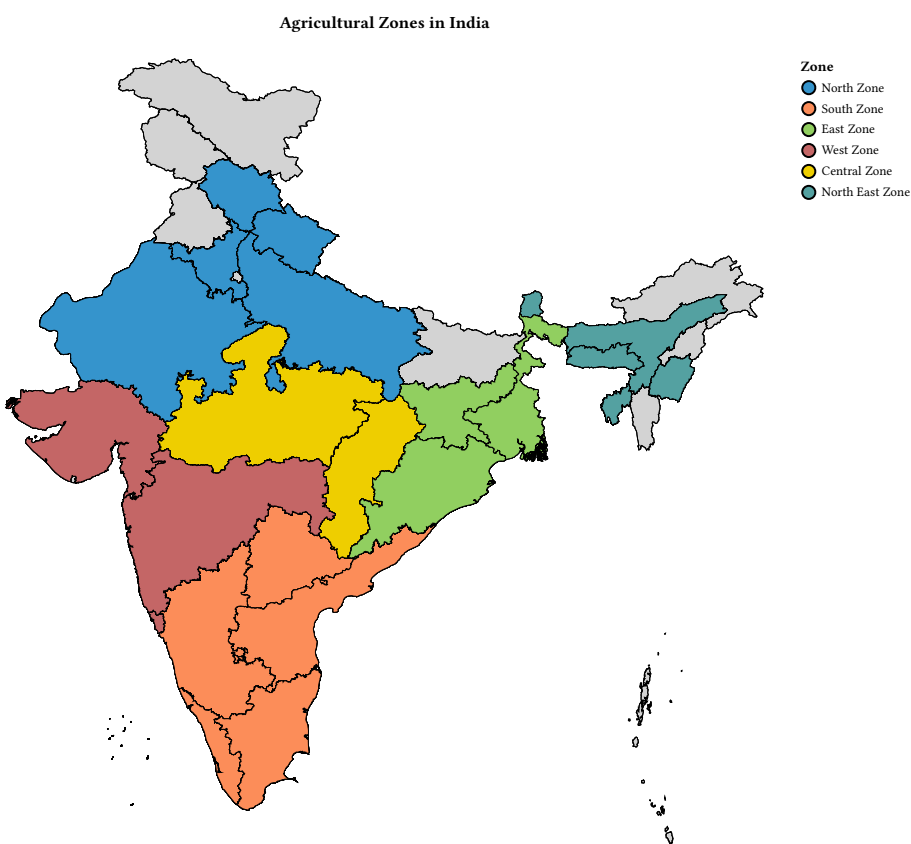


Figure 1: Agricultural zones of India with PMFBY coverage. Gray states indicate no data available or scheme not yet introduced.

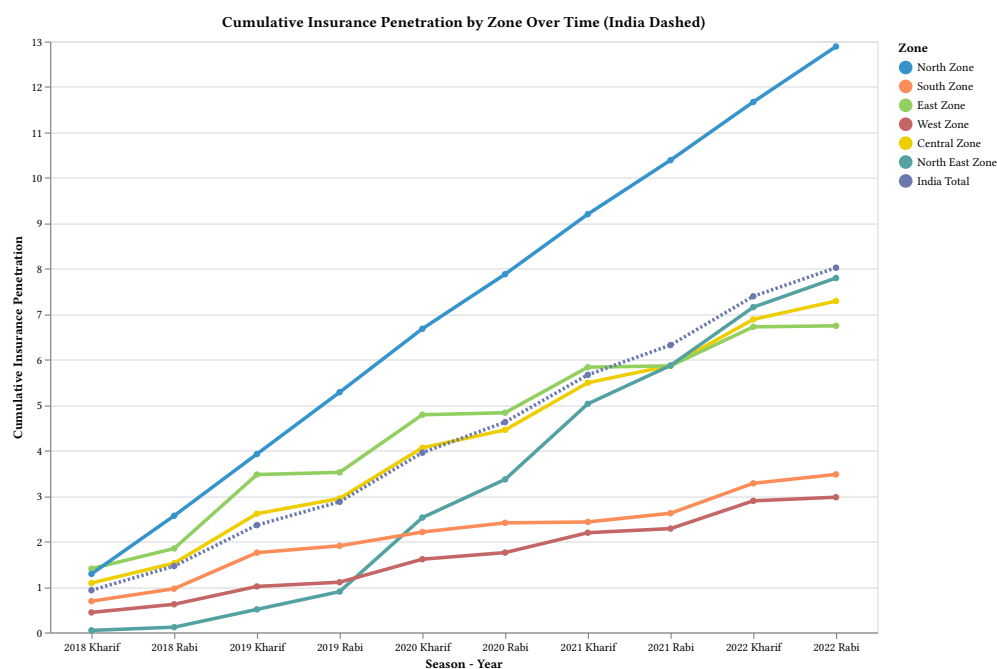


Figure 2: Enrollment growth trends across agro-climatic zones (2018-2022). Dashed line represents cumulative percent farmers insured across India.

Between 2018 and 2022, PMFBY enrollment grew across all operational zones. Zones like Northern, Southern, and Central emerged as the largest beneficiaries in absolute terms, with participation steadily increasing over time. One of the lines that stands out further is the one representing the North Eastern zone. For a region with relatively smaller number of farmer, there is a steep and steady increase since 2020.

An Unexpected Pattern

However, looking at absolute enrollment numbers masks a striking pattern. When normalized by the total farmer population in each zone, the Northeast region emerges as the clear leader in insurance penetration—despite having the smallest absolute numbers.

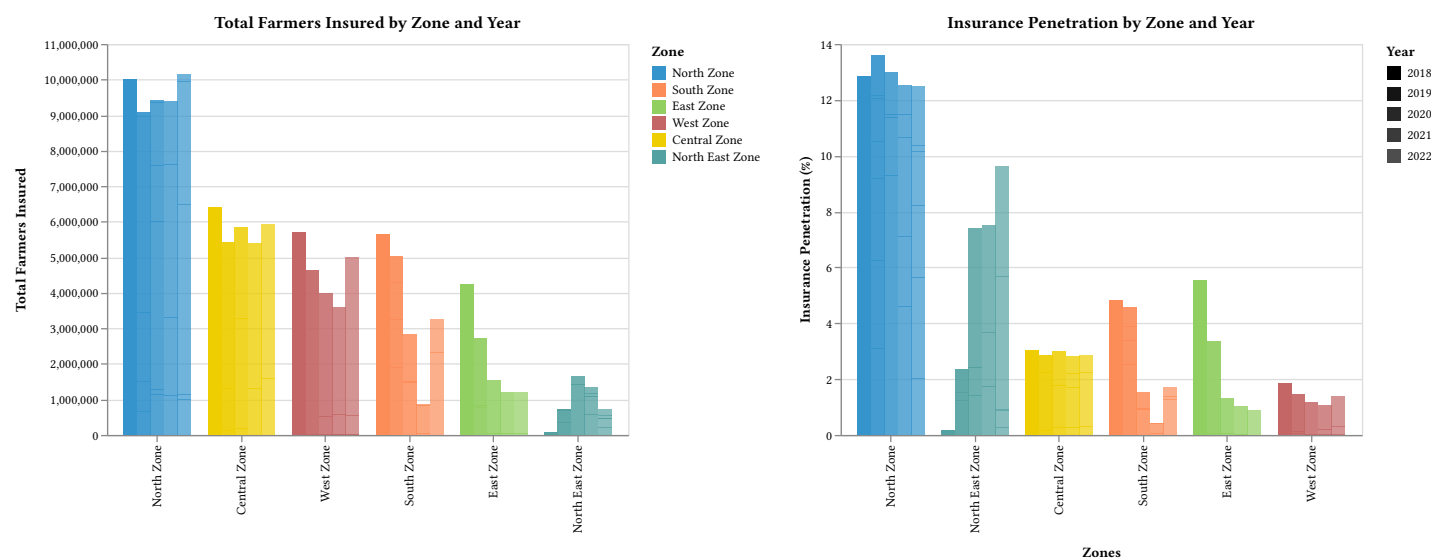


Figure 3: Insurance penetration rates by zone. While absolute numbers vary, the Northeast shows disproportionately high coverage relative to farmer population.

Temporal analysis reveals when this penetration accelerated. The darkest cells correspond to the Northeast in early 2020 and early 2021, indicating rapid adoption during this period even as other regions showed more modest growth. Darker Kharif season cells also reflect end-of-fiscal-year patterns, with increased enrollment as the financial year concludes.

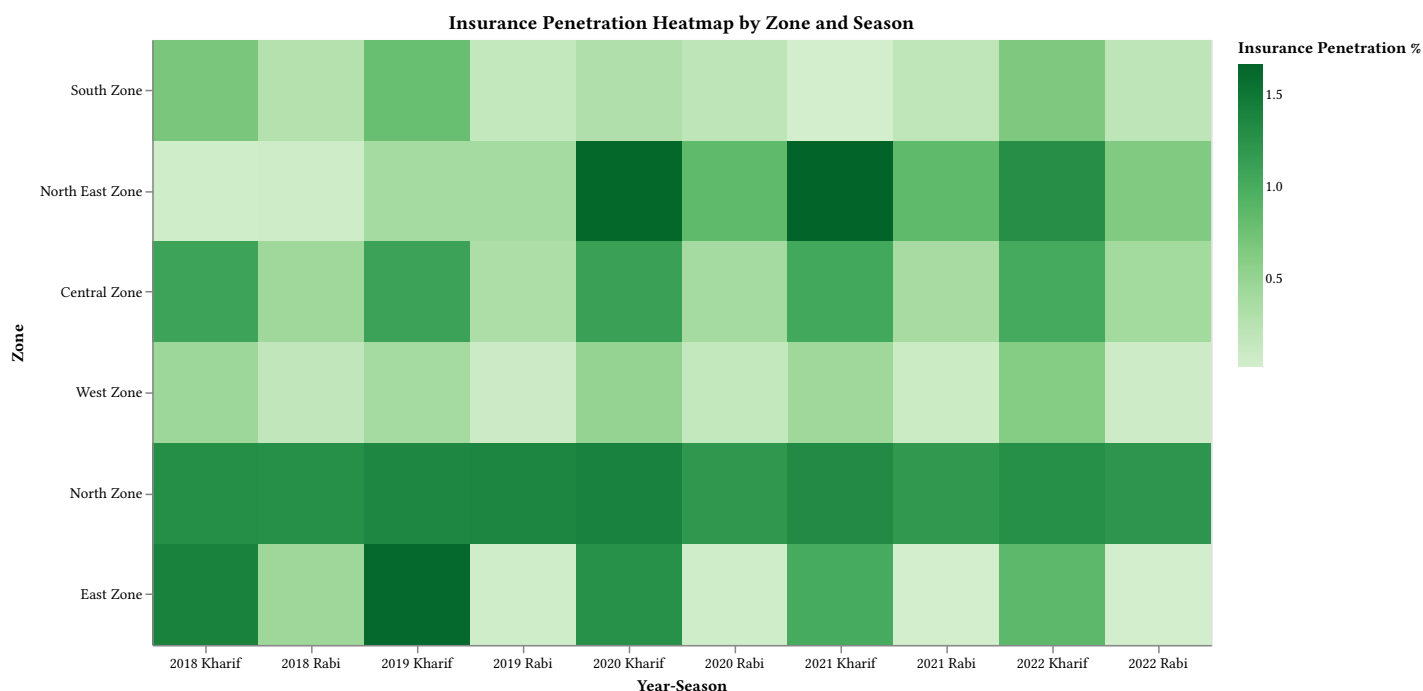


Figure 4: Heat map showing temporal patterns of enrollment growth. Darker colors indicate periods of rapid increase.

Northeast India: Overview

Northeast India comprises eight states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. It connects to the rest of the country by the narrow Siliguri Corridor. The region is known for its rich ethnic diversity, high rainfall, and mountainous terrain, which shape both its culture and economy. Agriculture in Northeast India is characterized by diverse traditional practices like jhum cultivation (shifting cultivation), influenced by the region's hilly terrain and tropical climate which also supports major crops like rice, tea, and various horticultural products.

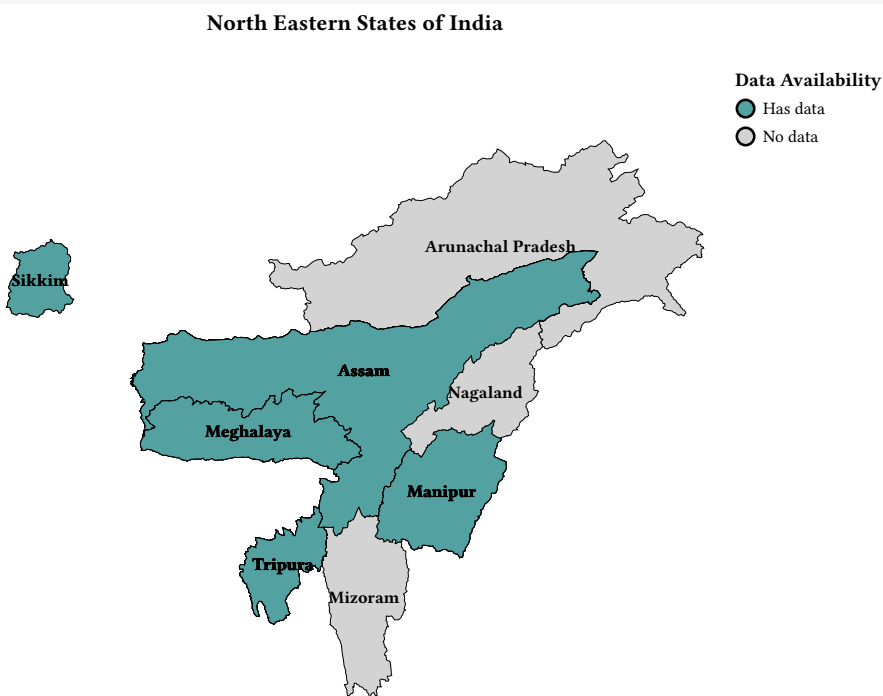
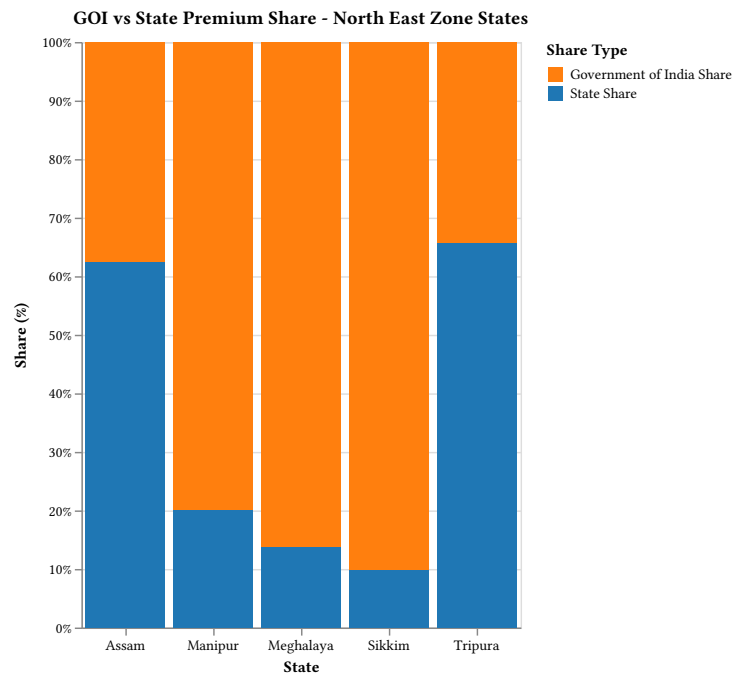


Figure 5: Map of North East India. Gray states indicate no data available or scheme not yet introduced.

Following the Money



At the state level within North East, Government of India (GOI) contributes a larger share compared to any other state or zone. The key to understanding this anomaly lies in the premium subsidy structure. Regional analysis shows the gross premium to sum insured ratio is highest in southern states (0.81%) and western states (0.56%), while it is lowest in the central zone and northeastern states. This reflects the heavily subsidized nature of coverage in the Northeast.

Figure 6: State-level GOI vs State Premium within the Northeast zone.

In northeastern states, the Centre pays 90% of the premium subsidy compared to the 50-50 split between Centre and states elsewhere. This disproportionate central support substantially reduces the effective cost burden on both farmers and state governments. In Manipur, Sikkim, and Meghalaya the states covered under PMFBY—central funding accounts for the vast majority of premium subsidies.

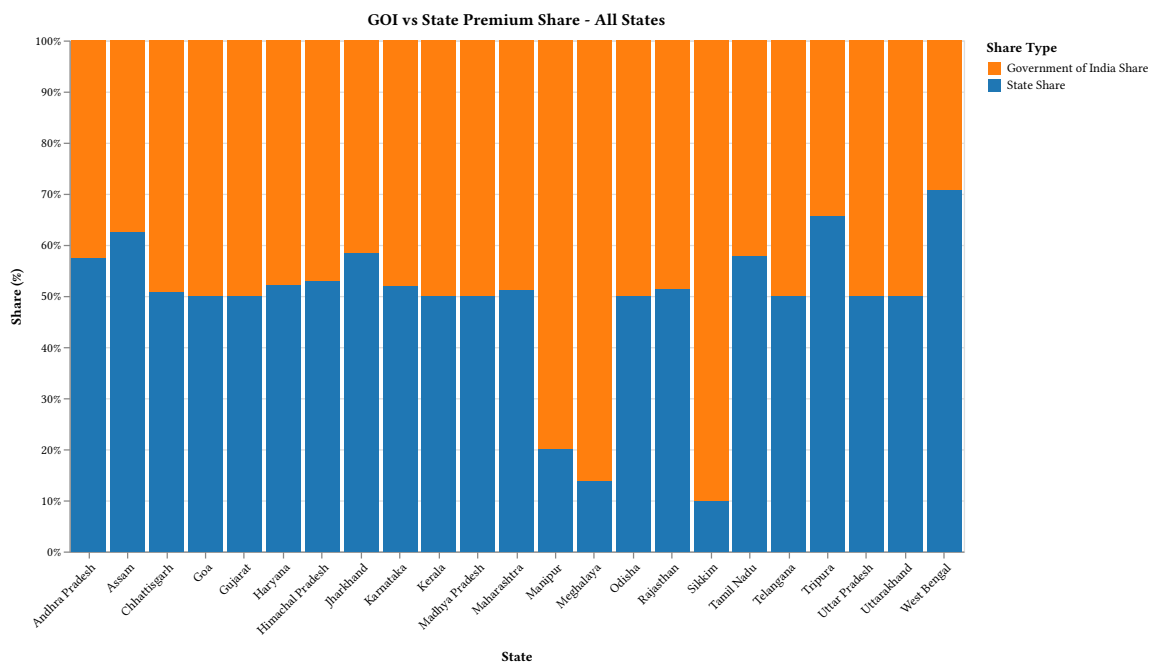


Figure 7: Government share of premium subsidies across states. Northeast states receive disproportionate central funding.

The North East's Challenges

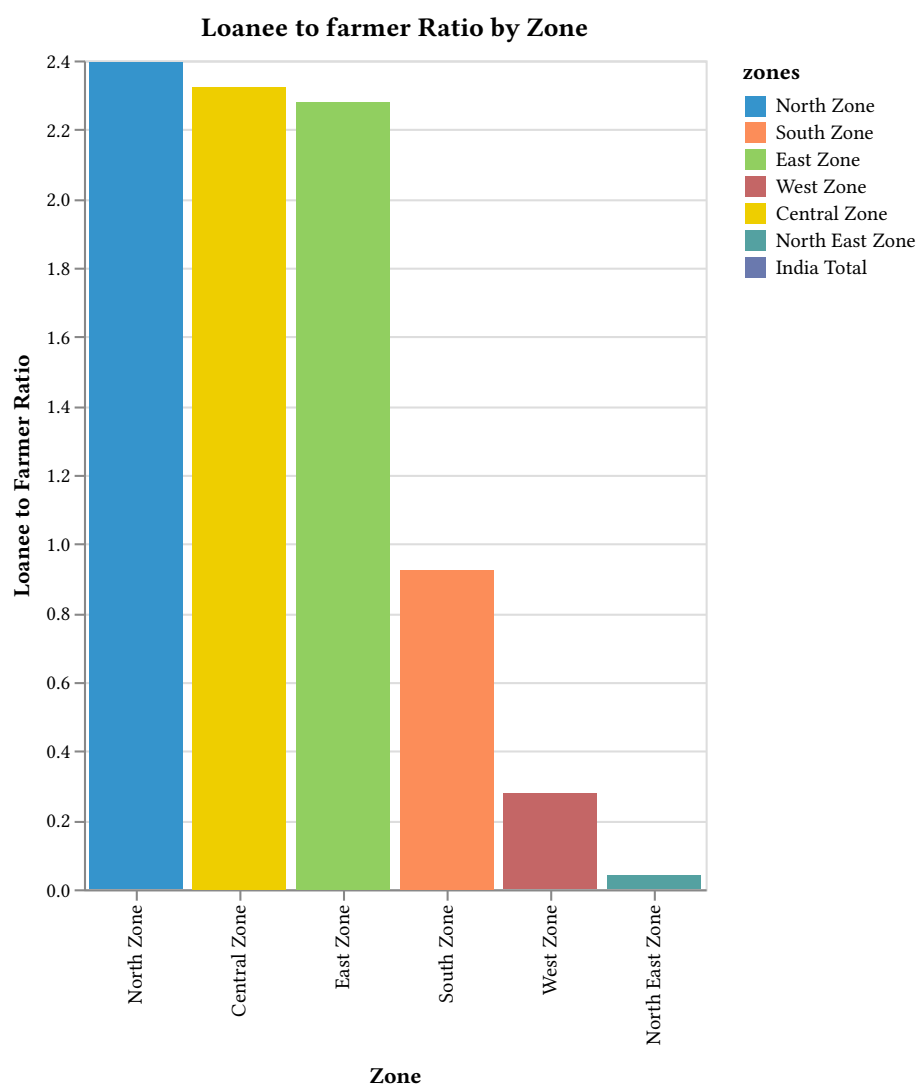


Figure 8: Loanee to total farmer ratio by zone (2018-2022). Low loanee proportions in the Northeast reduce automatic enrollment, decreasing commercial viability for insurers.

The high GOI contribution (Figure 5 and 6) and relatively high insurance penetration rate (Figure 2) is particularly notable given the region's severe implementation challenges. Out of seven northeastern states, four (Mizoram, Nagaland, Manipur, and Arunachal Pradesh) are not fully covered under PMFBY due to insurance companies' lack of interest, states' inability to pay their premium share due to insufficient budgets, and high administrative costs that make insurers hesitant to bid for these states.

Additional barriers include lack of proper land records and historical yield data especially at the block and gram panchayat level, difficulties conducting crop cutting experiments necessary for accurate yield estimation, small farmer loanee populations (except in Assam), which reduces guaranteed enrollment and makes the scheme less commercially viable for insurers, and inadequate weather forecasting infrastructure affecting weather-based insurance schemes.

Female Farmers and the Northeast

The Northeast's insurance landscape reveals another dimension: the region has a disproportionately high share of women farmers compared to the rest of India. States like Manipur and Sikkim stand out not only for their exceptional PMFBY penetration rates but also for their higher proportion of female agricultural workers.

This demographic reality has prompted targeted awareness campaigns under PMFBY specifically aimed at women farmers in the Northeast. However, research indicates that despite higher overall participation rates in these states, women farmers face persistent barriers that limit their ability to fully benefit from the scheme.

Key challenges include lack of formal land ownership, which creates complications in enrollment and claim processes, limited awareness about scheme provisions and application procedures, and patriarchal norms that often exclude women from decision-making about crop insurance despite their central role in agricultural

production. The intersection of gender and regional policy creates a complex picture. While the 90% central subsidy makes PMFBY financially accessible in the Northeast, the gendered barriers to access suggest that high penetration rates may mask disparities in who actually benefits from the scheme.



Women's predominance in northeastern agriculture combined with structural barriers to formal insurance participation highlights the need for gender-sensitive implementation strategies alongside financial support. This adds another layer to understanding the Northeast anomaly, regional penetration rates reflect not just fiscal intervention, but also the demographics of who farms the land and the specific barriers different groups face in accessing agricultural support systems.

Figure 9: Scatter plot showing proportion of female farmers with PMFBY insurances. All states with the exception of Sikkim have higher or equivalent proportion of female farmers.

Conclusion

PMFBY adoption in India reveals how targeted fiscal policy can overcome structural barriers to achieve unexpected outcomes. The Northeast's relatively high penetration rate in states like Manipur, Sikkim, and Meghalaya is directly linked to the central government's 90% premium subsidy, compared to the 50-50 split elsewhere.

However, high penetration rates mask important limitations. Despite leading in coverage ratios, the Northeast underperforms in absolute farmers covered, area insured, and claims paid. The region's mountainous terrain, incomplete land records, limited weather forecasting infrastructure, and low loanee farmer populations create persistent operational barriers that subsidies alone cannot resolve.

The gender dimension adds further complexity. With disproportionately high shares of women farmers, the Northeast's agricultural landscape differs fundamentally from other regions. Yet structural barriers like lack of land ownership, limited awareness, and patriarchal norms suggest that high penetration rates may mask disparities in who actually benefits from the scheme.

The Northeast case demonstrates both the power and limits of subsidy-driven interventions. While the 90% central funding successfully drove adoption where market forces would have failed, penetration does not guarantee equitable benefit distribution. In India's most vulnerable agricultural regions, financial barriers may be the easiest obstacles to overcome but operational, infrastructural, and social constraints require more complex interventions beyond premium subsidies alone.

Data Sources

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