Introduction

The Pradhan Mantri Fasal Bima Yojana (PMFBY), launched in 2016, represents India's most ambitious attempt at nationwide crop insurance under a "One Nation-One Scheme" framework. Replacing three previous fragmented programs such as the National Agricultural Insurance Scheme (NAIS), Modified NAIS, and the Weather-based Crop Insurance Scheme, PMFBY promised standardized protection across India's diverse agricultural landscape.

Under this unified framework, farmers pay nominal premiums: 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, with special provisions for northeastern states where the Centre bears 90% of the subsidy burden. The scheme covers the entire cropping cycle from pre-sowing to post-harvest, protecting against prevented sowing, standing crop failure from droughts, floods, pests, diseases, and extreme weather events.

This analysis examines PMFBY adoption patterns from 2018 to 2022, revealing how regional implementation has diverged dramatically from this uniform vision.

I. Agricultural Foundations

India's Agricultural Zones

India's agricultural diversity spans fifteen agro-climatic zones, each shaped by distinct rainfall patterns, soil types, and temperature variations. These environmental factors determine both crop vulnerability and insurance needs. The scheme is available to all farmers—including sharecroppers and tenant farmers—with loanee farmers automatically enrolled and non-loanee farmers able to voluntarily participate. As per the Indian economic survey 2020–21, agriculture employed more than 50% of the Indian workforce and contributed 20.2% to the country's GDP. Slow agricultural growth is a concern for policymakers as some two-thirds of India's people depend on rural employment for a living.

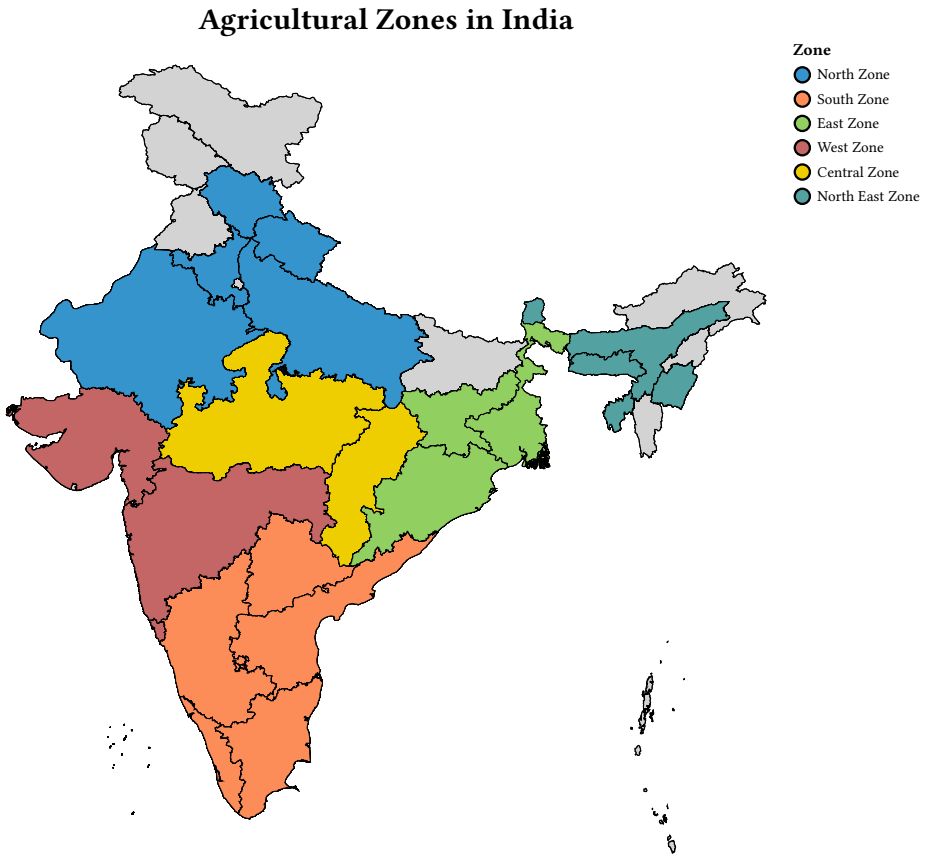

Figure 1: Agricultural zones of India with PMFBY coverage. Gray states indicate no data available or scheme not yet introduced.

II. The Northeast Emerges

A Pattern of Growth

Between 2018 and 2022, PMFBY enrollment expanded across all operational zones. The Northern, Southern, and Central zones dominated in absolute terms, accounting for millions of enrolled farmers. Yet beneath these headline numbers, a different story was unfolding in India's northeastern corridor.

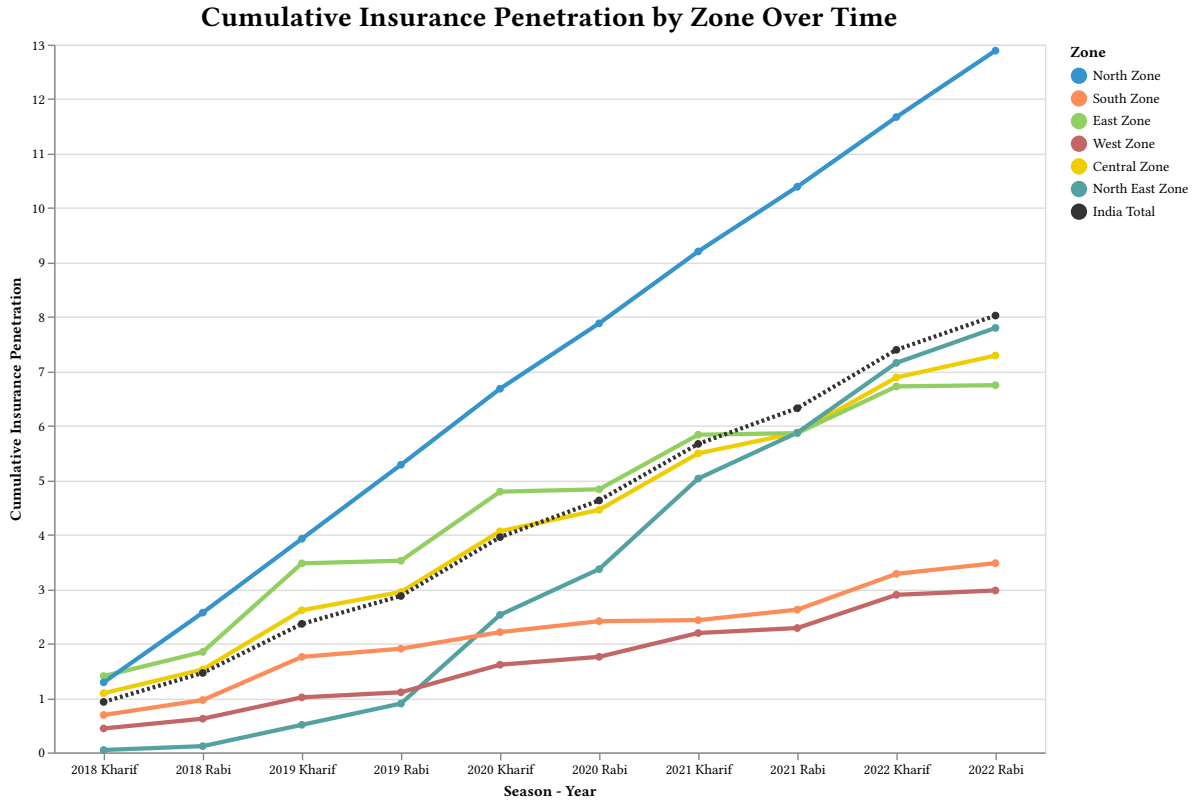

Figure 2: Enrollment growth trends across agro-climatic zones (2018-2022). The Northeast shows steep growth despite smaller absolute numbers.

The Northeastern zone's trajectory stands out: steep and steady growth beginning in 2020, despite representing a relatively smaller farmer population. While larger zones enrolled more farmers in absolute terms, the rate of adoption in the Northeast suggested something qualitatively different was occurring.

The Hidden Leader

Absolute enrollment numbers, however, mask a striking pattern. When normalized by total farmer population, the Northeast emerges not as a minor participant but as the clear leader in insurance penetration achieving coverage rates that dwarf those of India's agricultural heartlands.

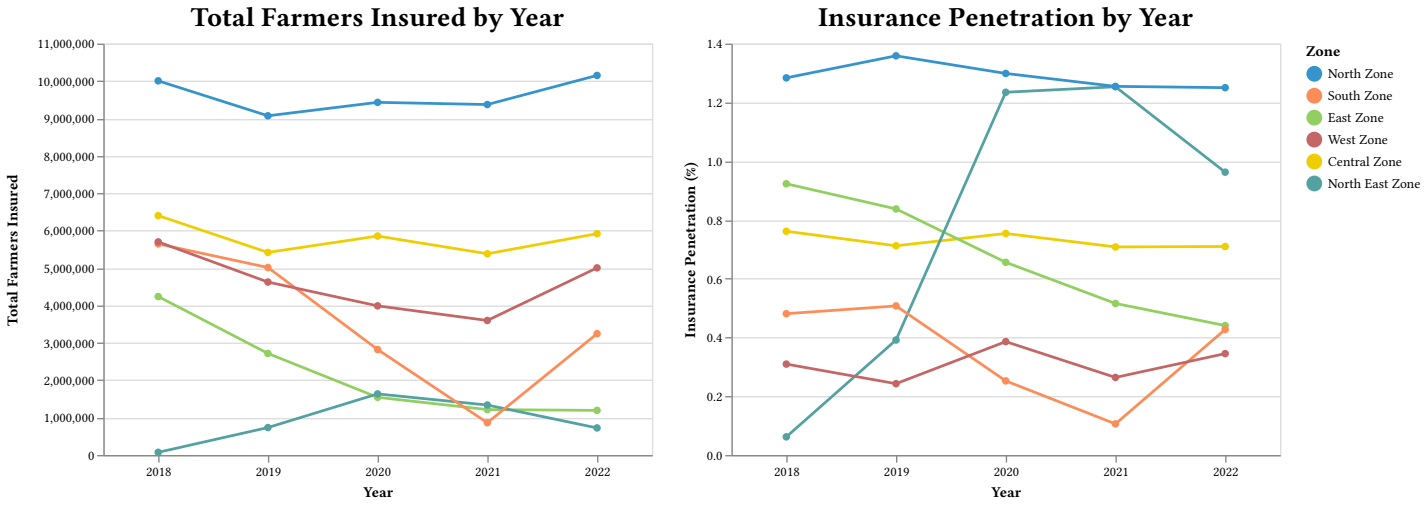

Figure 3: Insurance penetration rates by zone (percentage of total farmers enrolled). The Northeast achieves disproportionately high coverage relative to its farmer population, surpassing all other regions by 2022.

This divergence poses a compelling question: What explains the Northeast's exceptional adoption rates? Traditional explanations such as better outreach, higher climate vulnerability, or favorable demographics would suggest similar patterns across comparable agricultural zones. The Northeast's unique trajectory demands deeper investigation.

Regional Context

Northeast India: A Distinct Agricultural Landscape

Northeast India comprises eight states: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. Connected to mainland India by the narrow Siliguri Corridor, the region is characterized by ethnic diversity, high rainfall, and mountainous terrain. Agriculture here follows traditional practices like jhum cultivation (shifting cultivation), shaped by hilly topography and tropical climate. Major crops include rice, tea, and horticultural products.

This distinct agricultural context of small landholdings, diverse crops, high rainfall variability makes the region both uniquely vulnerable to climate risks and potentially well-suited to insurance schemes designed for such challenges.

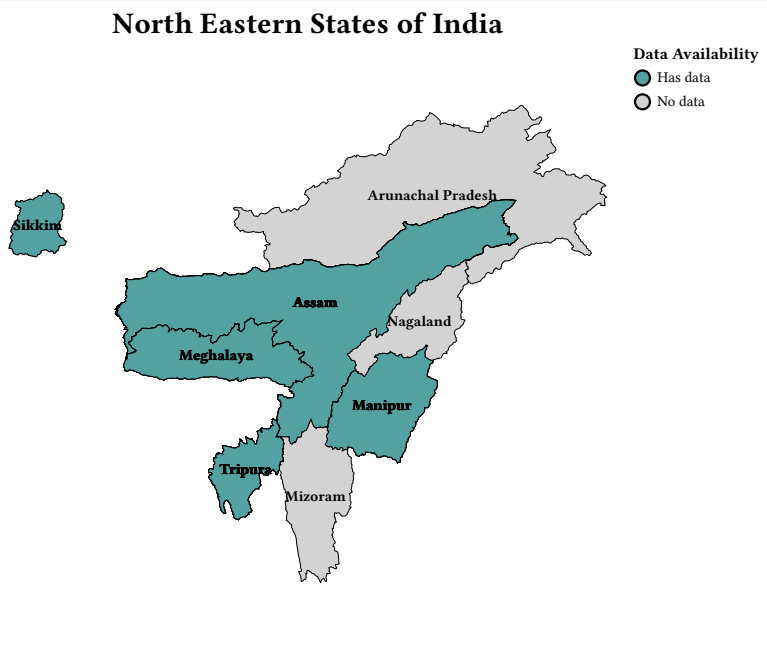

Figure 4: Map of Northeast India. Gray indicates states where PMFBY data is unavailable or the scheme has not been introduced.

When the Shift Occurred

Temporal analysis reveals when this penetration accelerated. The darkest cells in the heatmap correspond to the Northeast in early 2020 and early 2021, indicating rapid adoption during this period even as other regions showed more modest growth. This timing aligns with the phased expansion of PMFBY into northeastern states: while Assam and Tripura had operational coverage from 2020 onwards, states like Manipur and Sikkim began with minimal coverage that gradually expanded, and Meghalaya showed dramatic enrollment growth particularly from 2022-2023. The concentration in kharif seasons (June-October) reflects both agricultural cycles and end of fiscal year enrollment patterns. This staggered state by state rollout in the Northeast explains the sustained growth trajectory visible in aggregate regional data—each state's addition created successive waves of new enrollment rather than a single adoption surge.

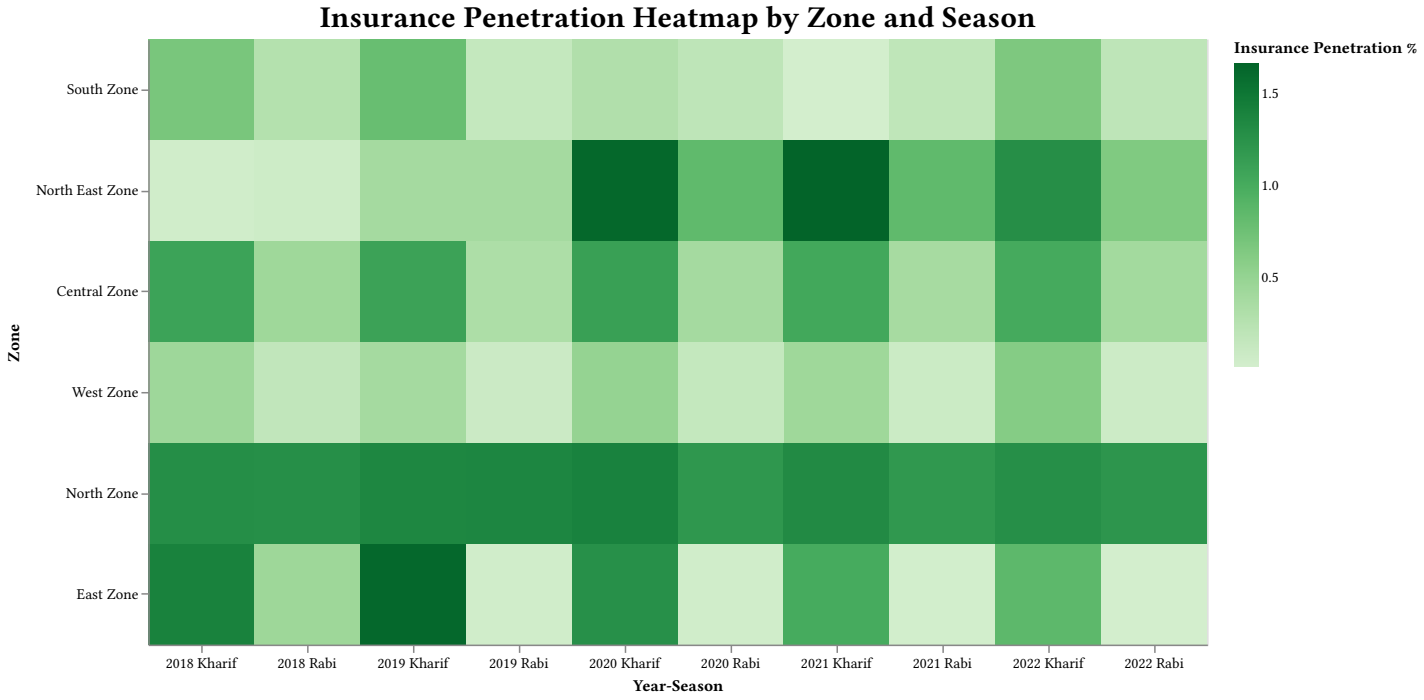

Figure 5: Heat map showing temporal patterns of enrollment growth across zones and seasons. Darker colors indicate periods of rapid increase. The Northeast shows concentrated growth in 2020-2021, distinguishing it from gradual expansion in other regions.

III. The Paradox

Two Schemes, Two Stories

To understand the Northeast's exceptional penetration, we must examine the schemes operating within PMFBY's framework. Despite the "One Nation-One Scheme" branding, PMFBY actually operates through two distinct mechanisms:

1. **PMFBY (yield-based)**: Covers losses based on actual crop yield shortfalls
2. **WBCIS (Weather-Based Crop Insurance Scheme)**: Pays out based on adverse weather parameters like rainfall, temperature, and humidity

If the Northeast's success reflects the national scheme's design, both mechanisms should show similar patterns. What we discovered instead challenges the premise of uniform implementation.

The Critical Finding

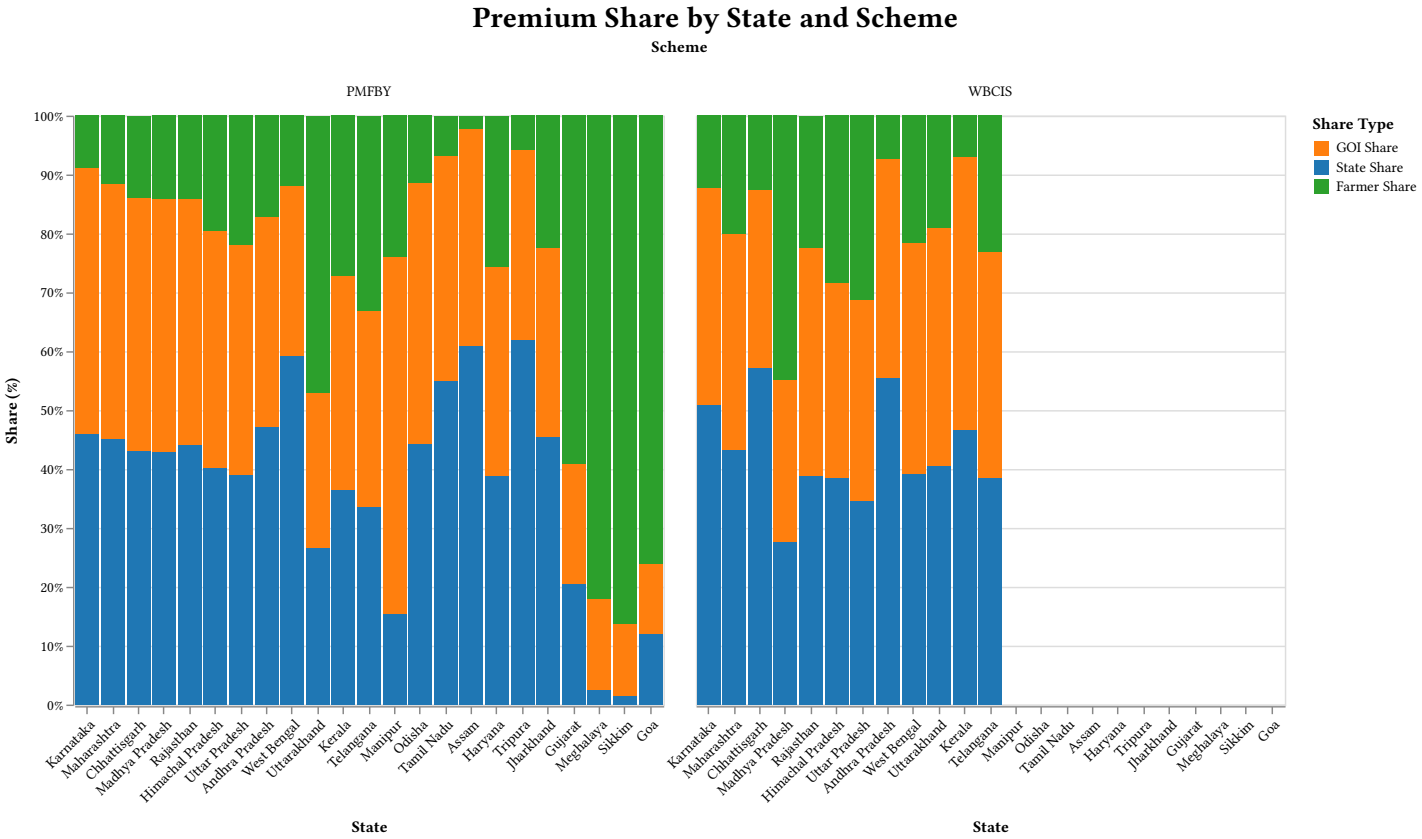

Figure 6: Premium subsidy distribution by state and scheme. Left panel shows PMFBY (yield-based), right panel shows WBCIS (weather-based). Orange represents Government of India share, blue represents state government share, green represents farmer share.

The scheme-separated analysis reveals a startling divergence:

WBCIS maintains uniform subsidy structures across all states. Government entities (Centre and State combined) consistently cover 75-85% of premiums, with farmers contributing 15-25%. This consistency spans from Karnataka to Kerala, from Odisha to Rajasthan exactly as the "One Nation-One Scheme" framework promises.

PMFBY, however, shows dramatic variation. Most states follow the expected pattern: government subsidizes 75-90% of premiums, farmers contribute 10-25%. But a distinct group of states - Gujarat, Goa, Sikkim, and Meghalaya, operate under a completely inverted structure. Here, farmers bear 60-90% of the premium burden, paying six to nine times the intended contribution rate.

The Northeast's Hidden Divide

This finding transforms our understanding of the Northeast's "success." The region's high penetration rates conceal a fundamental split:

- **Assam and Tripura** follow standard PMFBY subsidy structures, with government bearing the majority of costs
- **Sikkim and Meghalaya** require farmers to pay 60-90% of premiums approaching commercial insurance rates rather than subsidized protection

The Northeast's aggregate penetration success, therefore, obscures two contradictory realities: genuine subsidized expansion in some states, and potentially unsustainable farmer-funded enrollment in others.

The Illusion of Uniformity

Conclusion

PMFBY's "One Nation-One Scheme" branding promised equitable crop insurance access across India's diverse agricultural landscape. Our analysis reveals a more complex reality: while enrollment metrics suggest widespread adoption, subsidy structures have diverged dramatically from the intended framework.

Three key findings emerge:

1. **Geographic divergence in implementation**: States like Sikkim, Meghalaya, Gujarat, and Goa operate PMFBY with inverted subsidy structures, where farmers pay 60-90% of premiums far exceeding the nominal 2-5% rates promised by the scheme. This represents not minor variation but a fundamental departure from PMFBY's design.
2. **The consistency paradox**: WBCIS maintains uniform subsidy rates (75-85% government contribution) across all participating states, demonstrating that consistent implementation is administratively feasible. PMFBY's variation appears to be a policy choice, not an operational constraint.
3. **Unanswered policy questions**: These patterns suggest several possible explanations, none of which align with PMFBY's stated principles:
   - States opted out of standard subsidy-sharing arrangements
   - Coverage shifted to commercial crops ineligible for central subsidies (particularly relevant for Gujarat's commercial agriculture)
   - Voluntary enrollment replaced automatic coverage, fundamentally changing the scheme's nature
   - Different interpretations of "actuarial premium" led to divergent subsidy calculations

Policy Implications

The Northeast's high penetration rates, viewed in this light, tell two contradictory stories: successful outreach in states like Assam and Tripura, but potentially problematic enrollment in Sikkim and Meghalaya where farmers bear unsustainable premium burdens. This raises urgent questions about evaluation metrics. Should PMFBY's success be measured by enrollment numbers alone, or should subsidy equity be the primary criterion? If the goal is financial protection for vulnerable farmers, then high-penetration, low-subsidy regions may represent policy failure rather than success.

For policymakers, the central challenge is clear: restore the "One Nation-One Scheme" principle in practice, not just in name. Farmers in Sikkim should receive comparable financial protection to farmers in Assam not because they belong to the same region, but because they participate in the same national scheme.

The variation in PMFBY implementation suggests that India's crop insurance framework operates more as fifteen schemes under one brand than as a genuinely unified program. Addressing this requires either: (a) standardizing subsidy-sharing formulas across all states, (b) acknowledging regional variations and adjusting enrollment targets accordingly, or (c) transitioning anomalous states to WBCIS, which has demonstrated the capacity for uniform implementation. Without such reforms, PMFBY's promise of equitable protection will remain aspirational—a vision undermined by the very diversity it was designed to accommodate.

Data Sources

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