

Pastoralism, Agricultural Modernisation, and Rural Transformation: Lessons from Nigeria's Middle Belt and India's North-Western States

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Abstract

Pastoralism and settled agriculture have historically coexisted across much of the Global South, yet their relationship has grown increasingly fraught under conditions of demographic pressure, climatic stress, and state-led agricultural modernisation. In Nigeria's Middle Belt, notably Benue, Taraba, and Plateau states, farmer–herder conflicts have intensified, displacing hundreds of thousands of people and eroding indigenous institutions that once mediated access to land and seasonal grazing. In contrast, India's north-western states of Punjab and Haryana represent a paradigmatic case of state-driven agrarian transformation, where Green Revolution technologies enabled remarkable gains in cereal production and national food security but generated severe ecological stresses, particularly groundwater depletion and soil degradation.

This paper offers a comparative analysis of these two trajectories, arguing that the Punjab–Haryana experience contains both opportunities and cautions for debates on rural transformation in Nigeria's Middle Belt. It draws on literatures on pastoralism, agrarian political economy, environmental security, and conflict transformation, as well as policy debates on livestock reform and sustainable agriculture in Nigeria and India. Building on this corpus and the emerging India–Africa cooperation agenda, the paper contends that elements of agricultural modernisation—such as improved irrigation, crop diversification, and rural market integration—can support food security and economic stability in the Middle Belt, but only if pursued in ways that protect pastoral mobility, respect customary land rights, and minimise ecological externalities. Rather than viewing pastoralism as an anachronistic obstacle to development, the analysis foregrounds its adaptive strengths and proposes pathways for integrating indigenous land-use practices with context-sensitive modernisation. The paper concludes that a genuinely inclusive rural transformation requires reimagining state policy away from sedentarisation and high-external-input agriculture toward negotiated, multi-scalar governance of land, water, and mobility.

Keywords: Farmer–Herder Conflict, Pastoralism, Agrarian Transformation, Environmental Security, Land Governance

Introduction

Pastoralism and settled agriculture form two interdependent yet often competing land-use systems in large parts of Africa and Asia. In the semi-arid and sub-humid zones of West Africa, herding communities have historically relied on seasonal mobility to access dispersed water and pasture, while farming communities

have expanded rainfed and irrigated cultivation on fertile plains and river valleys. In India's alluvial north-west, state-led efforts from the late 1960s onward transformed peasant agriculture into a highly commercialised, input-intensive system centred on wheat–rice rotations, canal and tubewell irrigation, and public procurement at minimum support prices.

The juxtaposition of Nigeria's Middle Belt and India's Punjab–Haryana region offers a fruitful comparative lens for thinking about rural transformation in the Global South. Both regions have been labelled national “food baskets”, yet they are embedded in distinct political economies, ecologies, and conflict histories. The Middle Belt has become the epicentre of Nigeria's herder–farmer violence, with long-term displacement, contested narratives of indigeneity, and debates over routes, grazing reserves, and anti-open-grazing laws. Punjab and Haryana, by contrast, are confronting the ecological limits of an earlier developmental success, as falling groundwater tables, soil fatigue, and air pollution from crop residue burning have triggered calls for deep policy reform.

The core question animating this paper is how lessons from the agrarian trajectory of Punjab and Haryana can inform more context-sensitive strategies of agricultural modernisation and rural transformation in Nigeria's Middle Belt. This inquiry is not about transplanting a Green Revolution model across regions, but about critically appraising which elements of that experience—irrigation expansion, input delivery, price support, and market integration—might be selectively adapted, and which aspects should be explicitly avoided in order to safeguard pastoral livelihoods and fragile ecologies.

The paper proceeds in six parts. The first section outlines the conceptual framework, drawing on agrarian political economy, theories of protracted social conflict, and environmental security. The second section reconstructs the evolution of pastoralism and farmer–herder relations in Nigeria's Middle Belt, focusing on institutional change and recent violence. The third section analyses the Green Revolution and post-Green Revolution dynamics in Punjab and Haryana, highlighting both productivity gains and environmental costs. The fourth section develops a structured comparison across key dimensions—land tenure, water control, market regimes, and conflict management. The fifth section discusses policy implications for Nigeria's Middle Belt, with a particular focus on the National Livestock Transformation Plan (NLTP) and the possibilities of India–Africa cooperation. The conclusion reflects on the broader lessons for inclusive, ecologically grounded rural transformation in the Global South.

Conceptual Framework

Agrarian Political Economy and Rural Transformation

The literature on agrarian political economy offers important tools for situating pastoralism and agricultural modernisation within wider processes of capitalist development and state formation. Fan and Gulati (2007) emphasise how state investments in irrigation, research, and rural infrastructure in India and China catalysed productivity gains but also reshaped class relations and regional inequalities. Mukherjee's study of the Green Revolution in Punjab details how various types of technological change interact with land concentration, tenancy, and caste hierarchies to develop a range of rural accumulation and stratification.

Research on pastoralists and land in West Africa demonstrates that herding is not merely a remnant of premodern societies, but rather a dynamic response to varied ecology and new market opportunities.

According to Benjaminsen, Buseth, and Ba (2022), the recent conflicts between farmers and herders in the Middle Belt of Nigeria are examples of "eco-violence," with the roots of this type of violence being due to the changing access to land and grazing, the elite seizing resources, and the politicization of ethnicity and religion. In their research, Mercy, Fadare, and Edeh (2021) provided empirical evidence that violence in Nigeria's Middle Belt negatively affects the income and well-being of the farmers, which contributes to a cycle of insecurity and vulnerability.

Taking these factors into account, rural transformation should not just be understood as a technical sequence of intensification and mechanization. Rather, rural transformation is a multi-dimensional process of struggle for land, labor, and the distribution of public goods; and is mediated through local and state policy, local organizations, and global commodity chains. This perspective warns against the narratives that cast "traditional" pastoralists in opposition to "modern" agriculture, and highlights how both systems are being constantly reconstructed through markets, law, and violence.

Environmental Security and Protracted Social Conflict

The intensification of farmer–herder conflict in Nigeria's Middle Belt has increasingly been analysed through the lens of environmental security and protracted social conflict. According to Gurr's theory of relative deprivation, individuals who feel they are losing something of value an aspect of life could become violent. Such a situation could happen in the case of scarce resources like land, water and security. Azar's concept of protracted social conflict explains how the basic human needs of safety, security, acceptance, and participation are unmet for long periods, which leads to a conflict usually based on a racial or religious divide.

Between pastoralists and farmers, both see one another as usurping respective resources in the Middle Belt. Federal and state governments find it difficult to police land-use laws and keep everybody safe. According to the International Crisis Group, Nigeria's herder–farmer crisis has become a permanent crisis, resulting in violence, local militias and a breakdown of law and order, due to factors like population growth and the loss of land in the far north. The traditional way of dealing with cattle routes and pastures is losing effectiveness making it difficult to resolve differences amicably.

India's environmental security issues manifests not so much in violence between communities but rather in a gradual but stealthy destruction of the environment and farming problems. Research conducted in Punjab and Haryana shows that post initial production gains in Green Revolution, returns on these inputs have been declining, groundwater levels have fallen and these areas are more vulnerable to climate change. Research from policy documents and ICRIER says, the region is close to an ecological tipping point that can threaten local jobs and India's food security if subsidies, purchases and cropping patterns are not changed in a big way.

Conflict Resolution and Transformation

The comparative frame adopted here is also informed by the literature on conflict resolution and transformation. Burton's emphasis on addressing underlying human needs rather than merely managing symptoms, and Ramsbotham, Woodhouse, and Miall's conceptualisation of conflict transformation as long-term structural change, are particularly relevant. In Nigeria's Middle Belt, short-term peacekeeping or compensation schemes have not tackled the structural drivers of conflict: contested land rights, the

marginalisation of pastoralist voices in policy, and the erosion of shared norms around mobility and reciprocity.

At the same time, experiences from other agrarian contexts demonstrate that negotiated policy change, participatory land-use planning, and inclusive rural development can help transform zero-sum conflicts into more regulated forms of competition. In Punjab and Haryana, for example, emerging debates around crop diversification, water pricing, and climate-resilient agriculture open possibilities for reconfiguring state–farmer relations in more sustainable directions, even if these remain highly contested. Lessons from such processes can inform conflict transformation strategies in Nigeria, provided that differences in political regime, federal structure, and social cleavages are carefully considered.

Pastoralism and Farmer–Herder Conflict in Nigeria’s Middle Belt

Historical Patterns of Coexistence and Mobility

The Middle Belt has long been a zone of interaction between transhumant pastoralists—predominantly Fulani—and sedentary farming communities belonging to diverse ethnic and religious groups. Historical studies describe pre-colonial and colonial arrangements in which cattle migration along designated routes was coordinated with local authorities and farming communities, often under systems known by terms such as *burti* in parts of northern Nigeria. These systems combined customary authority, local negotiation, and state recognition to allocate wet-season and dry-season grazing, manage stock routes, and adjudicate disputes.

Such arrangements were underpinned by complementary economic exchanges. Pastoralists supplied manure and milk, while farmers offered crop residues, grain, and access to markets. Land was often conceptualised as a layered resource, with multiple users sharing space across seasons rather than holding exclusive, individualised titles. Customary tenure regimes recognised both farming and grazing claims, albeit in ways that privileged some groups over others and were always open to renegotiation.

Drivers of Contemporary Conflict

Since the late twentieth century, this historically embedded coexistence has been strained by a combination of demographic, environmental, and political factors. Population growth across Nigeria has increased demand for farmland and settlement, leading to the cultivation of former grazing lands and the occupation of stock routes. Climate change and desertification in the far north have pushed many more pastoralists in the south. This development has lengthened transhumance routes, while herds have further concentrated in the Middle Belt where rainfall and vegetation are still relatively more favourable.

The expansion of commercial agriculture and increasing monetisation of land activate these pressures. The spread of mechanised farming and cash crops in Benue, Taraba and Plateau is encouraging the enclosure of land and formal titling systems and undermining communal land-use systems that used to allow access for seasonal grazing. According to Benjaminsen et al., elites have seized on crisis narratives surrounding farmer–herder conflict to justify land grabs, securitisation, and punitive measures against pastoralists, depicting them as intruders rather than co-owners of the rural commons.

Violence has been further intensified by the proliferation of small arms, the rise of community-based militias, and wider patterns of insecurity linked to banditry and insurgency. International Crisis Group estimates suggest that deaths from herder–farmer clashes in Nigeria have, at times, rivalled those from the Boko Haram insurgency, though figures vary across sources. MSF and humanitarian agencies report large-scale displacement across Middle Belt states, with Benue alone hosting over 160,000 internally displaced persons (IDPs) in formal and informal camps, in addition to thousands of Cameroonian refugees.

Institutional Erosion and Legal Responses

A critical dimension of this crisis is the weakening of indigenous and statutory institutions for managing pastoral mobility. Many of the historically recognised grazing reserves and corridors have been encroached upon or converted to other uses, while local government capacity to mark and maintain routes has declined. Customary leaders who once mediated disputes often lack authority over powerful armed actors, and their decisions may be contested by younger generations or politicised along ethnic and religious lines.

State responses have tended to oscillate between criminalisation and technocratic reform. Several states in the Middle Belt, notably Benue, have enacted anti-open-grazing laws that criminalise transhumant herding and require livestock owners to adopt ranching. These policies resonate with a global discourse of “modernising” pastoralism through sedentarisation, yet they often proceed without adequate land-use planning, financial support, or consultation with pastoral communities. Critics argue that abrupt bans on open grazing, in the absence of viable alternatives, risk deepening marginalisation and fuelling further conflict.

At the federal level, the National Livestock Transformation Plan (NLTP) 2019–2028 seeks to provide a more comprehensive framework, combining ranch development, grazing reserves, and support for livestock value chains with conflict-mitigation measures and institutional reform. Its implementation has, however, been uneven and politically contested, particularly over questions of land acquisition, compensation, and the role of federal versus state authorities. The NLTP nonetheless signals an important shift away from purely securitised responses toward more developmental and regulatory approaches to the livestock sector.

Socioeconomic Impacts

The socioeconomic impacts of farmer–herder violence in the Middle Belt extend far beyond immediate casualties and displacement. Mercy, Fadare, and Edeh’s econometric work shows that exposure to violence reduces household income and agricultural productivity, partly through the destruction of crops and livestock and partly through reduced labour supply and market access. Insecurity discourages investment in improved seeds or fertiliser, while the destruction of rural infrastructure—roads, storage facilities, irrigation works—undermines longer-term development prospects.

Talented Youth are ‘Harvested’ by Conflict in the Nigerian Middle Belt. One can expect that herd splitting, migration to alternative pastures and other non-livestock livelihoods become increasingly difficult or denied altogether, prompting a number of youth to enter precarious jobs or armed war-gear. In the farming communities, the need to equate human life with loss of livestock, together with fear of attacks and

retaliatory violence, intersects with over a decade of aggravating agrarian distress, such as lack of access to credit, volatility of inputs prices and climate-related shocks.

Collectively, these processes indicate that both pastoralism and agriculture in the Middle Belt need to be seen in a broader context, namely crisis of rural governance, where state has been severely challenged on the question of who must control the land, and how that control is orchestrated. Thus, attempts to ‘modernise’ agriculture in this context need to arise from a more sensible understanding of conflict dynamics, rather than assuming the ‘stable’ environment of the rule of law.

Agrarian Transformation and Ecological Crisis in Punjab and Haryana

The Green Revolution and Its Achievements

Punjab and Haryana stand at the heart of narratives about India’s Green Revolution. In the late 1960s and 1970s, these states became key sites for the introduction of high-yielding varieties of wheat and rice, supported by large-scale investments in canal irrigation, rural electrification, fertiliser distribution, and price support through minimum support prices (MSP) and public procurement. Fan and Gulati highlight how these investments formed part of a broader rural development strategy that aimed to tackle food deficits and rural poverty while strengthening state legitimacy.

Mukherjee’s early ethnographic work in Punjab captured the profound social changes unleashed by this technological package: rising rural incomes for landowning farmers, increased demand for wage labour, and the reconfiguration of caste and class relations in the countryside. Over subsequent decades, Punjab and Haryana emerged as India’s major surplus producers of wheat and rice, contributing a disproportionate share to the central grain pool and enabling the country to achieve national self-sufficiency and even export surpluses.

Ecological Limits: Groundwater Depletion, Soil Fatigue, and Pollution

The Green Revolution’s success, however, rested on a narrow wheat–rice cropping system that has proven ecologically unsustainable. Paddy cultivation in semi-arid Punjab and Haryana requires large volumes of irrigation water, much of it supplied through tubewell extraction of groundwater. Studies and policy briefs note that rice–wheat systems have led to rapidly falling groundwater tables, with some districts in Haryana experiencing declines of around 13 metres between 2000 and 2021, and large portions of Punjab classified as “over-exploited” in terms of groundwater use.

Free or highly subsidised electricity for agriculture has encouraged farmers to drill deeper tubewells and pump water extensively, weakening incentives for water conservation. The dominance of rice–wheat has also contributed to soil degradation, including nutrient imbalances from excessive fertiliser use, declining organic matter, and salinity and waterlogging in some canal-irrigated tracts. Pesticide use has raised concerns about human and ecosystem health, with some research pointing to elevated cancer rates in parts of Punjab, though causal pathways remain debated.

Air pollution is another critical dimension. The mechanisation of harvesting through combine harvesters leaves large quantities of crop residue on fields. To quickly prepare land for the next wheat crop, many farmers burn this stubble, releasing smoke and particulate matter that contribute to severe air quality

problems in north India's winter months. Despite legal bans and subsidy schemes for residue management machinery, stubble burning persists due to tight sowing windows, labour shortages, and weak enforcement.

Socioeconomic and Political Dynamics

Agrarian transformation in Punjab and Haryana has generated its own rural distress and conflict, though different from the Nigerian's Middle-Belt. The profit margin is declining for many growers, particularly small farmers, who also suffer from high indebtedness, as yields stagnate, and the costs of cultivation increase. The rigidity of the MSP–procurement regime, which heavily favours wheat and rice, trumps incentives for diversification into less water-intensive and higher-value crops, even where market linkages exist.

Policy debates in India increasingly recognise these contradictions. The ICRIER policy brief titled 'Saving Punjab and Haryana from Ecological Disaster' argues that the current agri-food policies are fiscally burdensome and environmentally damaging, and calls for a gradual reorientation towards diversified cropping systems, better water pricing, and more targeted income support. Scholars such as Singh emphasise that "rural development of Punjab", is going astray, a phenomenon credited to, among others, dietary dependence on monoculture of cereals, youth out-migration, and increasing inequalities.

Recent farmer mobilisations, most notably the 2020–2021 farmer protests against central farm laws, further brought tensions around market reform, state capacity, and agrarian livelihoods to the surface. "Punjab and Haryana farmers thus emerged as the key protagonists with deep mistrust of deregulating markets and allowing corporate players in agricultural trade". Any attempt to restructure cropping patterns or subsidy regimes in the region must reckon with powerful farmer unions and the historical social contract between state and agrarian community.

Emerging Responses: Diversification and Water-Saving Technologies

In dealing with ecological concerns, a range of policy and technological initiatives is being looked into in Punjab and Haryana. These include promotion of shorter-duration rice-varieties, direct-seeded rice (which can reduce water-use), micro-irrigation, diversification to maize, pulses, oilseeds, fruits and vegetables. The International Rice Research Institute (IRRI) in Haryana, among other similar institutions, has established pilot projects aimed at increasing water-use efficiency and strengthening farmers' knowledge through training and extension.

There is also some interest in review of procurement policies and subsidy policies to ensure support policies of subsidies and subsidies procurement policies are reviewed to make alternative crops more attractive and to promote shifts away from paddy in the most stressed blocks. Other proposals suggest differentiated MSPs, conditional incentives based on groundwater status, or payments for ecosystem services to compensate farmers shifting to less water-intensive cropping. However, the political economy of such reforms will be complex given the deep entrenchment of the existing support structures as well as farmers' perception of risks.

From a comparative perspective, the key lesson is that once a region has locked into a particular technological and policy regime—such as high-input, irrigated rice–wheat monoculture—shifting toward sustainability is difficult and contentious. The Punjab–Haryana case thus offers both a caution and a source of lessons for the design of more diversified and resilient agricultural modernisation in other areas.

Comparative Dimensions: Middle Belt and Punjab–Haryana

Ecological and Climatic Contexts

Nigeria’s Middle Belt and India’s Punjab–Haryana region differ markedly in ecological and climatic terms. The Middle Belt straddles the transition from the semi-arid north to the more humid south, with a pronounced wet and dry season pattern that historically facilitated seasonal transhumance. Pastoral mobility has been a key adaptation to spatial and temporal variability in pasture and water, allowing herds to exploit heterogeneous resources and avoid localised shocks.

Punjab and Haryana, by contrast, are dominated by alluvial plains historically suited to a variety of rainfed and irrigated crops. Canal networks built under colonial and postcolonial regimes, combined with rapidly expanding tubewell irrigation, created the conditions for intensive, double-cropped agriculture. Climatic variability certainly exists—droughts, heat waves, unseasonal rain—but the system has been buffered by infrastructural investments and extensive groundwater extraction.

These differences have significant implications for the feasibility and desirability of particular modernisation pathways. Large-scale sedentarisation of livestock and fixed-field cultivation without attention to rainfall variability may undermine resilience in the Middle Belt, whereas in Punjab and Haryana, the challenge is to reduce over-intensification and restore ecological balance.

Land Tenure and Resource Governance

Land tenure regimes in the two regions also diverge. In the Middle Belt, customary landholding systems coexist with statutory tenure, with considerable local variation. Claims to “indigeneity” and autochthony structure access to land and political representation, often to the detriment of mobile populations seen as “settlers”. The individualization and commodification of land have complicated these arrangements and created overlapping and sometimes conflicting claims.

In Punjab and Haryana, land is more fully incorporated into formal cadastral and titling systems, although tenancy, sharecropping, and intra-family arrangements blur the picture. The Green Revolution occurred mostly within the framework of private landownership and state-led irrigation and marketing infrastructure. While conflicts over land exist, they are less framed around indigeneity than the Middle Belt and pastoral mobility is not a core axis for contestation.

These contrasts provide the context for agricultural modernisation’s interaction with conflict. These contrasts influence how agricultural modernisation interacts with conflict. In the Middle Belt, policies that formalise land rights or promote ranching can easily be perceived as favouring some ethnic groups over others, thereby intensifying communal grievances. In Punjab and Haryana, policy changes around subsidies, procurement, or water pricing can cause protests and distributional conflicts, but not the intense conflicts over residency and land rights that exist in other areas.

Modes of Agricultural Modernisation

The modes of agricultural modernisation pursued in each region also differ. In Punjab and Haryana, a deliberate state–science alliance promoted high-yielding varieties, chemical inputs, mechanisation, and price support, underpinned by significant public investment in research and extension. The primary thrust was to raise yields and marketable surpluses of a few staple crops, particularly wheat and rice.

In Nigeria’s Middle Belt, by contrast, agricultural modernisation has been more uneven and fragmented. While there are pockets of mechanised farming and commercial crop production, many smallholders continue to practise low-input, rainfed agriculture. Livestock development has been constrained by under investments to veterinary services, pasture management and market infrastructures. Policy frameworks have also treated crop and livestock sectors separately instead of as components of mixed farming system.

Thus, tension between pastoralism and agriculture has been dealt with piecemeal, through security operations, ad hoc grazing reserves or state-level grazing bans, as opposed to an integrated strategy of rural transformation. This has limited cropping pastoralists and agriculture tension in a piecemeal manner using security operations, ad hoc or state level grazing bans without linkage to an integrated strategy of rural transformation.

Conflict Patterns and Governance Responses

Conflict patterns in the two regions represent their differing agrarian history. Conflict patterns in the two regions reflect different agrarian histories. The Middle Belt has seen recurrent cycles of communal violence involving herders, farmers, militias, and security forces, with high levels of displacement and human rights abuses. Governance responses include military deployments, vigilante groups, dialogue forums, and compensation schemes. Such conflicts have therefore been warned by international and domestic observers to be at risk of further entrenchment, without structural reforms of land governance, justice mechanisms, and rural development.

Punjab and Haryana have also had their shares of agrarian unrests ranging from the insurgency in Punjab in the 1980s and 1990s to periodic agitations by farmers in Punjab and Haryana over prices, debts and policy reforms. Punjab and Haryana insurgency, and farmer agitations over prices, debt, and reforms have occurred in Punjab and Haryana states without descending into communal violence over land use, through organised protest, electoral competition, and negotiation. The institutional capacity of the Indian state to provide minimum services, enforce contracts, and organise procurement has generally been stronger than in rural Nigeria, despite its many limitations. This does not imply that Punjab and Haryana offer a simple template for peaceful agrarian change. Rather, their experience underscores the importance of institutionalised channels for articulating agrarian grievances and contesting policy, as well as the risks of ignoring ecological feedbacks until they become acute.

Lessons and Opportunities for Nigeria’s Middle Belt

Avoiding the Ecological Pitfalls of High-Input Monoculture

One of the most immediate lessons from Punjab and Haryana for Nigeria’s Middle Belt is the danger of locking into high-input monoculture systems without regard for long-term ecological sustainability. The severe groundwater depletion and soil degradation now confronting these Indian states illustrate the

cumulative impact of decades of input-intensive rice–wheat rotations underpinned by distorted incentives and weak regulation.

For the Middle Belt, where water scarcity, climate variability, and land-use conflicts are already acute, replicating such a model would be environmentally and socially hazardous. Efforts to expand irrigation and introduce high-yielding varieties should be designed around diversified, climate-resilient cropping systems that integrate trees, legumes, and fodder crops, rather than narrowly focusing on cereals. Investments in small-scale, farmer-managed irrigation, water harvesting, and soil conservation can support productivity gains while reducing dependence on large-scale infrastructure that may be vulnerable to capture or neglect.

Recognising and Valuing Pastoralism

A second lesson is the need to recognise pastoralism as a productive and adaptive livelihood system, rather than treating it as a residual or “backward” sector to be replaced by settled ranching. Research across the Sahel and semi-arid Africa has documented the efficiency of mobile livestock systems in converting sparse vegetation into high-value protein, their contribution to national economies, and their capacity to adapt to highly variable environments.

In the Middle Belt, policies that seek to eliminate open grazing and rapidly sedentarise pastoralists risk undermining these adaptive capacities and triggering resistance. Instead, lessons from integrated crop–livestock systems—both within Nigeria and internationally—suggest that facilitating negotiated access to dry-season grazing, protecting and restoring stock routes, and supporting mobile veterinary and marketing services can yield gains for both farmers and herders.

The Punjab–Haryana case is instructive here in an indirect way. The neglect of livestock and fodder systems in favour of cereal monoculture has contributed to nutrient imbalances and vulnerability to price shocks. A more integrated approach to crop and livestock development, with balanced attention to fodder production, manure management, and mixed farming, might have mitigated some environmental harms.

Designing Incentive-Compatible Policies

The political economy of agricultural policy in Punjab and Haryana highlights the need for incentive-compatible reforms. After farmers have organized their production around MSPs for a limited number of crops, any effort to pull back or significantly change these support systems faces stiff resistance. This implies that in the Middle Belt of Nigeria, where support systems are less institutionalized, there is still room to craft incentive regimes that pay for diversification, sustainable practices, and conflict-sensitive land use.

Subsidies and public investments could be focused on:

- Drought-resistant and less land-hungry crops that are more suitable to agro-ecologies in the region.
- Community-managed water resources that benefit both farmers and pastoralists.
- Participatory land use planning that identifies and safeguards grazing routes, dry season pastures, and wetlands.

- Livestock value chain development (processing, cold storage, and markets) that increases pastoralists' earnings without necessarily sedentarizing them.

The Indian experience with public procurement and price support also has lessons for stabilizing farmer incomes in the Middle Belt. Rather than adopting the MSP system wholesale, Nigeria might consider region-specific price guarantees, risk-sharing instruments, or carefully planned grain and fodder stockpiles that make farmers less vulnerable to climatic and market fluctuations.

Strengthening Institutions for Conflict Transformation

While the Indian State has a greater ability to utilize negotiation methods, Courts and the electoral process for the management of agrarian unrest, parts of Nigeria have been experiencing more violent trajectories. As a result, in order to realise any vision of Rural Transformation, it is crucial to strengthen the institutional arrangements in place to mediate between resource-related disputes within the Middle Belt.

This requires both revitalising or strengthening existing customary mechanisms of resolution, where these mechanisms continue to have legitimacy, and ensuring that they operate in an inclusive and accountable manner. Furthermore, it will require building the capacity and impartiality of local government structures, such as local courts and land commissions, as well as the various security agencies within the Middle Belt in order to enforce any agreements reached and protect the most vulnerable members of the community.

In addition to the local structures, multi-stakeholder platforms that include pastoralists associations, farmer unions, traditional authorities and government representatives should be used to negotiate a set of common rules regarding land-use, access to water and freedom of movement across the Middle Belt.

Based on the success of participatory approaches in Water and Irrigation Programmes and in Watershed Management in India, there appears to be significant potential for similar methods of collective/resource management to be applied to the Middle Belt; however, the outcomes from these methods will inevitably differ from one community to the next. The work of Mehta on the Politics and Poetics of Water in Western India, along with the research by Shah et al. on the transformation of agriculture and water use, illustrates that technical interventions will only succeed if they are based upon an understanding of both local power relations and gender dynamics, as well as competing claims over the same resources. Therefore, the experience and insights gained from India's Water and Irrigation programmes will be of great relevance to the initiatives being implemented in the Middle Belt regarding Grazing Reserves, Water Points and Small-Scale Irrigation Systems.

India–Africa Cooperation and Knowledge Exchange

The increased cooperation between India and Africa has created a way for lessons learned to be put into action. Examples from India, such as farmer cooperatives, dairy cooperatives, rural electrification, and digital technology in agriculture, have many ideas that would work in Nigeria, to an extent. At the same time, India can learn from the work of African countries in areas such as livestock risk management, index-based insurance for livestock, and managing community-based natural resources.

Rather than just applying one approach to other areas, cooperation should be used as a way to test and learn from each other's experiences. Collaborating with Indian and Nigerian research institutes, regional organisations and local communities will create partnerships that could be used to develop:

- Integrated farming/animal husbandry operations that are applicable to the ecological systems in Nigeria's Middle Belt.
- Climate change resilient pasture and forage production strategies
- Community based land use planning and strategies to avoid conflict in agricultural production systems
- Water-saving technologies used in India that can be modified for local conditions in Nigeria

In order for these projects to succeed, they must be part of a larger co-operative relationship that respects and puts an equal voice to local communities and pastoralists, rather than giving the majority of the power and influence to corporations or technocratic experts.

Conclusion

The juxtaposition of Nigeria's Middle Belt and India's Punjab–Haryana region illuminates both the promises and perils of agricultural modernisation in the Global South. In the Middle Belt, the intensification of farmer–herder conflict reflects not merely ecological stress but deep-seated governance failures and the marginalisation of pastoral livelihoods. In Punjab and Haryana, the ecological limits of the Green Revolution highlight the unintended consequences of a singular focus on cereal productivity underpinned by heavy public support.

This comparative analysis suggests that rural transformation cannot be pursued through technocratic packages alone. It must grapple with questions of land rights, mobility, social justice, and ecological sustainability. For Nigeria's Middle Belt, the key is not to replicate Punjab and Haryana's trajectory, but to distil from it a set of cautionary and constructive lessons. These include the need to avoid water-intensive monocultures, to recognise pastoralism as a modern and productive system, to design incentive structures that reward sustainable and conflict-sensitive practices, and to build robust institutions for mediating resource disputes.

India–Africa cooperation offers a promising platform for advancing such an agenda, provided that it is grounded in mutual learning and local participation. By integrating indigenous land-use practices with carefully calibrated modernisation strategies, it is possible to envision a form of rural transformation in the Middle Belt that enhances food security, supports diverse livelihoods, and strengthens social cohesion. In an era of climate uncertainty and demographic change, the stakes of getting this balance right could not be higher.

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