INSTITUTIONALIZING EQUITABLE, LOCALLY LED CLIMATE ADAPTATION: WHY SENEGAL NEEDS A NATIONAL AGRICULTURAL EXTENSION POLICY

African Technology Policy Studies Network (ATPS)
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About the SCALE Project

The Strengthening the Capacity of the Extension System to use Proven Knowledge and Technologies to Sustain Equitable Locally Led Adaptation Among Smallholder Farmers (SCALE) project is a flagship initiative of the African Technology Policy Studies Network (ATPS), funded by the International Development Research Centre (IDRC). Running from 2023 to 2027, the project works across Senegal and Nigeria to strengthen agricultural extension systems as effective knowledge brokers — capable of transferring climate- resilient technologies, practices, and innovations to smallholder farmers who are most exposed to the adverse effects of climate change. At its core, SCALE seeks to close the persistent gap between what climate science knows and what rural communities can access, use, and benefit from.

The project operates through a set of integrated activities that map the landscape of extension actors, assess capacity needs, document and scale proven locally led adaptation (LLA) and ecosystem-based adaptation (EbA) practices, and co-develop targeted training programmes with and for communities. Central to the SCALE approach is a commitment to gender equality and social inclusion (GESI), recognizing that equitable adaptation is only possible when women, youth, and other marginalized groups are not merely reached by services but are empowered to shape them. The project also contributes to the development of an Interactive Collaborative Environment (ICE) — a digital platform designed to facilitate knowledge exchange, peer learning, and policy dialogue at national and regional levels. This policy brief draws specifically on SCALE's diagnostic findings from Senegal's Saint-Louis region.

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The African Technology Policy Studies Network (ATPS) is a transdisciplinary network of researchers, policymakers, private sector actors, and civil society actors that promote the generation, dissemination, use, and mastery of Science, Technology, and Innovation (STI) for African development, environmental sustainability, and global inclusion. The ATPS has over 5,000 members and 5,000 stakeholders across more than 51 countries on 5 continents, with institutional partnerships worldwide. We implement our programs through members in national chapters established in 33 countries (29 in Africa and 4 Diaspora chapters in Australia, the United States of America, Switzerland, and the United Kingdom). In collaboration with like-minded institutions, the ATPS provides platforms for regional and international research and knowledge sharing to build Africa's capabilities in STI policy research, policymaking, and implementation for sustainable development.

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Key Messages

- Senegal's adaptation ambitions are undermined by a fragmented and under-resourced agricultural extension system, limiting the consistent and equitable delivery of climate-resilient knowledge and services to smallholder farmers.

- Deep structural inequalities — particularly in land access, voice, and advisory support — continue to exclude women and youth, constraining their ability to lead and benefit from locally led adaptation efforts.

- Proven locally led and ecosystem-based adaptation practices exist but remain under-scaled, due to weak coordination, limited technical capacity in GESI and digital skills, and a persistent climate finance gap at the local level.

- A legally backed National Agricultural Extension Policy is essential to institutionalize coordination, embed gender and climate risk competencies in advisory services, and secure sustained, decentralized financing for equitable and locally led climate adaptation.

1. Introduction

Agriculture is the pulse of Senegal's rural economy. It employs roughly 30% of the national workforce, contributes approximately 16% of GDP, and underpins the food security and daily livelihoods of millions of families who have farmed the land for generations. Yet this foundational sector is increasingly under siege. In the Senegal River Valley — one of the country's most productive yet most vulnerable agricultural zones — rising temperatures, unpredictable rainfall, prolonged droughts, and devastating floods are compounding soil degradation, reducing water availability, and eroding yields of millet, rice, groundnuts, and sorghum. With rural poverty already exceeding 57%, each failed season translates directly into hunger, debt, and migration — pressures felt most acutely by the young.

Senegal's response to this challenge rests substantially on the performance of its Agricultural Extension System (AES) — the network of agents, institutions, and services designed to connect smallholder farmers with the knowledge, technologies, and support they need to adapt and thrive. National policy frameworks, including the National Adaptation Plan (NAP) and the Orientation Law on Agro-Sylvo-Pastoral Development (LOASP), formally recognize this role. The empirical evidence reinforces it: systematic research across sub-Saharan Africa consistently shows that functional access to extension services can increase the likelihood of climate-smart agriculture adoption by two to three times, while insecure land tenure and chronic underfunding sharply reduce uptake (Mnukwa et al., 2025; Belay et al., 2022).

The reality on the ground, however, tells a more troubling story. Women make up approximately 70% of Senegal's agricultural workforce — often managing household food production on plots averaging just 0.05 to 0.25 hectares — yet they remain largely excluded from formal advisory services and land rights. Young people, who represent the future of rural Senegal, are the demographic least engaged by extension agents. Across the system, fragmented institutional mandates, weak inter-agency coordination, and acute skill gaps — especially in gender-responsive approaches and digital technologies — are producing an extension system that too often fails the very people it is meant to serve.

2. Rationale for Strengthening the Extension System to support LLA

Senegal's agricultural extension system does not lack dedicated people — it lacks a unifying architecture. The absence of a National Agricultural Extension Policy has left the system structurally exposed: actors work in parallel rather than in concert, resources are stretched thin, and the most vulnerable farmers continue to receive the least support. A dedicated national policy would not create new bureaucracy; it would provide the legal backbone that transforms fragmented goodwill into sustained, coordinated action. Three interconnected failures make this case compelling.

2.1 A System Without a Centre: Fragmentation and Institutional Drift

Walk through Senegal's extension landscape and the problem becomes immediately visible. Multiple actors — public agencies, NGOs, civil society organizations, donor-funded projects — are all working toward broadly similar goals, yet rarely with one another. Geographic overlap is common; strategic alignment is not. The result is a system where communities may receive competing messages from different providers, while other communities receive nothing at all. Meanwhile, the essential bridge between agricultural research and farmer-facing services remains weak, and locally tested innovations struggle to travel beyond the communities where they were born.

Underlying this fragmentation is a chronic deficit of political will and public investment. Adaptation and extension have long been treated as technical matters rather than national priorities, leaving Senegal's extension system disproportionately dependent on the short-term cycles of international donors. When projects end, so does the momentum — and farmers are left to manage on their own. A systematic review of climate policy implementation across 16 West African countries confirms that this pattern is regional: agriculture features in almost every national policy, yet real progress is consistently blocked by underfunded institutions, weak farmer organizations, and an information vacuum at the local level (Sorgho et al., 2020). A formalized national extension policy would give the government a legal instrument to define clear mandates for public, private, and civil society providers; mandate coordination across the NAP, LOASP, SNEEG, and local development plans; and institutionalize the research-to-practice pipeline that is currently left to chance.

2.2 The Inequality Beneath the Surface: GESI Deficits and Capacity Gaps

Perhaps the most consequential failure of Senegal's current extension architecture is what it does

— and does not do — for women and young people. SCALE project data reveals that women in the Saint-Louis region farm average plots of approximately 0.23 hectares under severe land tenure insecurity, and that youth under the age of 27 are the stakeholder group least likely to be meaningfully engaged by agricultural advisors. These are not peripheral concerns; they represent a structural exclusion that undermines the equity and the effectiveness of the entire adaptation agenda. Research across the continent confirms the pattern: women farmers consistently have smaller plots, fewer credit opportunities, and less access to training, making the design and delivery of extension services a primary determinant of whether the gender gap in adaptation narrows or widens (Awoke et al., 2025; Nuhu & Matsui, 2022; Acheampong et al., 2023).

What makes this particularly sobering is that extension agents themselves are ill-equipped to address these dynamics. SCALE data records a mean GESI competency score of just 2.67 out of 5 among agents in the study area — a finding that speaks less to individual failing than to a system that has never made gender-responsive practice a professional requirement. A national extension policy would change this by making GESI integration mandatory across mandates and budgets; embedding it as a core competency in pre-service and in-service training; requiring gender- and age-disaggregated planning and monitoring; and formally recognizing women's cooperatives and youth networks as strategic delivery channels for capacity building at scale.

2.3 Finance as the Final Barrier: Closing the Climate Investment Gap

Even the most capable and well-coordinated extension system cannot function without resources. Yet Senegal's local-level climate finance landscape is, by any measure, inadequate. SCALE data shows that only 56% of smallholder farmers report having access to financial resources for climate adaptation — and among extension agents, that figure falls to a stark 16.67%. The barriers are well-documented and deeply frustrating for local organizations: application procedures are complex, project cycles are far too short (often capped at 18 months), and the technical capacity to formulate competitive project proposals is chronically scarce at the grassroots level.

The implications for locally led adaptation are direct and serious. Evidence shows consistently that LLA delivers genuinely transformative outcomes only when local actors have real control over both the resources and the decisions that shape them — and when gender equity is not a stated aspiration but a built-in program requirement (Tye et al., 2023; Shackleton et al., 2025). A National Agricultural Extension Policy must therefore do more than facilitate knowledge transfer: it must establish clear public budget lines for climate-responsive extension, create decentralized funding channels accessible to communes and producer organizations, and invest in the proposal-writing and financial management capacity that local actors need to mobilize resources and sustain impact beyond the project cycl

3. Methodology

3.1 Study Design

The study employed a convergent parallel mixed methods design, combining quantitative surveys with qualitative inquiry to generate a rich, multi-layered understanding of Senegal's agricultural extension system and its capacity for equitable climate adaptation. Structured surveys provided measurable, comparable data on knowledge levels, resource access, and stakeholder satisfaction, while Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) captured contextual nuance, institutional perspectives, and community-level realities that numbers alone cannot convey. The study was implemented by the ATPS Senegal National Chapter Coordinator in partnership with the Initiative Prospective Agricole et Rurale (IPAR), ensuring strong local expertise, institutional credibility, and deep familiarity with the study context.

3.2 Data Collection and Analysis

The study was conducted in the Podor Department of Senegal's Saint-Louis region — a zone at the front lines of climate variability, where farming communities are navigating the compounding pressures of erratic rainfall, land degradation, and resource scarcity. The sampling strategy deliberately prioritized diversity across gender and age, targeting the two largest producer organizations operating in the area: Ujak and Union de Galoya. In total, 79 individuals participated across the four stakeholder categories outlined in Table 1 below.

Stakeholder Category	Sample Size	Method	Focus
Smallholder Farmers	50	Survey	Capacity gaps, LLA practices, and climate change impact
Extension Agents	12	Survey / KII / FGD	Knowledge & skills, resource gaps, dissemination challenges
Researchers	6	Survey / KII / FGD	Research focus, collaboration, and funding challenges
Other Stakeholders	11	KII / FGD	Policy environment, climate finance, GESI integration

3.3 Data Collection

Data was collected using different methods. Structured questionnaires were employed to gather quantitative information on demographics, knowledge levels, resource availability, and satisfaction with services, with farmer data disaggregated by gender and age to support equity-focused analysis.

Key informant interviews (KIIs) were conducted as in-depth, semi-structured engagements with selected stakeholders across all groups, enabling the capture of institutional perspectives, identification of systemic barriers, and formulation of recommendations for reform.

Focus group discussions (FGDs) were organized with purposively selected homogeneous groups, including women-only and youth-only cohorts, to elicit diverse perspectives and contextual insights that may not be captured through individual interviews. A documentation audit was also undertaken through a systematic review of existing reports, project records, and field observations to identify, validate, and catalogue established LLA and EbA knowledge and technologies currently in use.

3.4 Data Analysis

Quantitative data were analysed using descriptive statistics — including frequencies, percentages, means, and standard deviations — and, where appropriate, Chi-square tests of independence were applied to examine the influence of variables such as gender and location on knowledge acquisition and resource access. Qualitative data from KIIs and FGDs were subjected to thematic analysis, with findings organized around key challenge areas and structured to complement and deepen the quantitative evidence. Throughout, the research team adhered strictly to ethical principles of informed consent, confidentiality, and cultural respect.

4. Major Findings

4.1 A Fragmented Policy Landscape

The most structurally consequential finding from the study is the absence of a unifying national extension policy—a gap that leads to a cascade of institutional failures with direct consequences for climate adaptation at the local level. In the absence of clear legal mandates, multiple actors pursue overlapping agendas across the same territories without coordination mechanisms or shared accountability. Research-to-practice linkages are weak, leaving locally validated adaptation knowledge under-documented and under-disseminated. Persistent underfunding reinforces donor dependency, introducing short-term project logic into a challenge that demands sustained, generational commitment. The cumulative effect is a system that is structurally incapable of delivering consistent, equitable, and technically sound advisory services — regardless of the quality of the individuals within it.

4.2 Capacity Gaps and Documentation of Proven LLA

Against this institutional backdrop, the study found a genuinely encouraging body of locally led and ecosystem-based adaptation practice already embedded in farming communities. Documented practices include the System of Rice Intensification (SRI), legume rotation, organic fertilization through compost and manure, construction of dikes and contour lines, and mulching — all of which have demonstrated effectiveness in improving yields and soil health under climate stress. These are not theoretical innovations; they are living knowledge, developed and refined by farmers navigating real conditions.

Farmers are, however, clear about how they want to learn. Field demonstrations received the highest preference score of 4.88 out of 5, followed closely by farmers' field schools at 4.86 — a resounding signal that practical, participatory, and place-based learning environments are the delivery model of choice. This finding has direct implications for extension design: digital and remote approaches, however cost-efficient, are unlikely to substitute for hands-on learning when it comes to building genuine adaptive capacity.

4.3 The Equity Deficit in Finance and Voice

These figures are more than statistics — they are a measure of how far the system falls short of the communities it serves. The financing gap is compounded by structural barriers that disproportionately disadvantage local actors: lengthy administrative procedures, project cycles capped at 18 months, and a chronic capacity shortage in project formulation and financial management among farmer organizations and civil society groups. For women and young people, the picture is even starker. Gender was found to be a significant determinant of whether a farmer's voice is heard by an advisory agent, and young people — the demographic with the most at stake in long-term adaptation — remain the least engaged of all. These are not peripheral concerns to be addressed through awareness campaigns; they are structural exclusions embedded in the current architecture of the extension system, and they demand structural solutions.

5. Conclusion

Senegal's smallholder farming communities are not without agency or knowledge. The study found vibrant, resourceful people who have been adapting to climate variability for years — developing and applying locally grounded practices with real impact. What they lack is not the will to adapt but the institutional architecture that would give their efforts the consistency, the reach, and the resources they need to scale. The SCALE diagnostic reveals a system at a crossroads: caught between a wealth of locally held knowledge and a poverty of institutional support; between ambitious national policy frameworks and a chronic failure of coordinated implementation; between the rhetoric of gender inclusion and the reality of women's and youth's marginalization from advisory services.

The path forward does not require reinventing what already exists. It requires the political will to formalize, fund, and connect what is already working — and to name, honestly, the structural barriers that stand in the way. A National Agricultural Extension Policy for Senegal would do precisely that: give the extension system a legal identity, a coordination mandate, a GESI spine, and a financial home. Without it, Senegal's adaptation ambitions will continue to be serviced by a patchwork of goodwill and donor cycles — and the farmers who need the most will continue to receive the least.

Call to Action: Policymakers, development partners, and civil society leaders must now move from diagnosis to design. The evidence is clear, the need is urgent, and the window for decisive action is narrowing. Strengthening the extension system's legal mandate, coordinating its institutional actors, investing in the capacity of its people, and decentralizing the climate finance that local communities need — these are not aspirational goals. They are the minimum requirements for a just and durable adaptation future for rural Senegal.

6. Policy Recommendations

The following recommendations are grounded in empirical evidence from Senegal's Saint- Louis region and structured to address the systemic barriers identified in this brief. Together, they constitute a coherent reform agenda for the Government of Senegal and its partners.

Recommendation 1: Enact a National Agricultural Extension Policy:
Legislation is the foundation. Without it, coordination remains voluntary, GESI integration remains optional, and funding remains unpredictable.

The Government of Senegal should develop and enact a dedicated National Agricultural Extension Policy that legally defines the roles and responsibilities of all extension providers — public, private, and civil society. The policy must mandate multi-stakeholder coordination across the NAP, LOASP, SNEEG, and local development plans, and institutionalize formal linkages between agricultural research institutes and frontline advisory services to ensure that locally validated adaptation knowledge reaches farmers systematically and at scale.

***Recommendation 2: Establish Multi-Stakeholder Coordination Platforms for EbA* Scale-Up:**
Proven adaptation practices exist in communities; what is missing is a structured system to validate, share, and scale them.

The government should establish and adequately fund permanent multi-stakeholder consultation platforms — a model that bring together extension agents, researchers, NGOs, producer organizations, and local government on a regular, structured basis. These platforms should serve as the institutional home for co-designing and updating Senegal's EbA strategy, ensuring that knowledge generated in the field informs national policy, and that national policy is translated into practical, context-sensitive advisory support. A significant increase in logistical and financial allocations to extension services is also necessary to enable the regular field visits, field schools, and farmer demonstrations that communities have identified as their most valued learning formats.

Recommendation 3: Decentralize and Simplify Climate Finance for Local Actors:

Local communities cannot lead adaptation if they cannot access the resources to sustain it. Financial reform is not optional — it is structural.

The government, in collaboration with development partners, should establish dedicated and predictable public budget lines for climate-responsive extension — including decentralized funds accessible directly by communes and producer organizations. Access procedures must be substantially simplified, with longer project cycles of at least three to five years to allow meaningful impact and learning. Targeted capacity-building programmes in resource mobilization, financial management, and project formulation should be provided to researchers, CSOs, and farmer organizations across Senegal. Kenya's County Climate Change Funds (CCCF) mechanism offers a proven and instructive model for how sub-national climate finance can be structured to reach and empower local actors effectively.

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