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PELUM KENYA
Networking for a Greener Africa

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Biodiversity and Biosafety Association Kenya

Effective IPM Association
"Improving People's Lives"

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Scaling up organic and bioinputs for sustainable agriculture in Kenya: Catalyzing healthier soils, safer food, and climate resilience

Executive Summary

Kenya's agriculture is at a crossroads, facing unprecedented threats from soil degradation, declining productivity, toxic agrochemical use, and climate-induced shocks. Organic and bioinputs—such as compost, biofertilizers, biopesticides, and ethnoveterinary medicines—offer scalable, proven solutions to build resilient farming systems, protect human and environmental health, and restore soil fertility. Despite mounting evidence and growing farmer interest, the widespread adoption of these inputs is blocked by systemic barriers: outdated regulations, exclusive subsidy programs, weak distribution networks, and a persistent perception gap. This policy brief outlines the urgent case for reform and provides actionable recommendations to unlock Kenya's bioinput potential and catalyze a just and regenerative transition in agriculture.

Key Messages

1. Bioinputs are not marginal alternatives—they are essential for Kenya's climate resilience, food safety, and soil regeneration.
2. Current policy and subsidy frameworks overwhelmingly favor chemical inputs, distorting markets and undermining sustainable innovation.
3. Only 6.4% of farmers have accessed commercial bioinputs due to limited awareness, poor distribution, and lack of technical support.
4. A reformed regulatory system, inclusive input subsidy policies, and targeted extension services are critical to scale bioinputs.
5. Investing in farmer-led and community-based bioinput solutions creates green jobs, supports SMEs, and drives inclusive rural economies.
6. The time to act is now—Kenya must mainstream bioinputs to secure healthy soils, healthy people, and a thriving agricultural future.

Introduction: The urgency of transitioning to bioinputs

Kenya's agriculture sector is at a critical juncture, facing mounting threats from soil degradation, stagnant productivity, high input costs, and the overuse of synthetic agrochemicals and antibiotics. Given its contribution of up to 20-21% of nominal GDP, 65% of export earnings, and support for 60–80% of rural livelihoods, safeguarding the sector's sustainability is not just a development priority—it is a national imperative for food security and economic resilience (FAO 2024, World Bank 2024, KNBS 2024).

For decades, Kenya's farmers have relied on indigenous knowledge and traditional practices to manage pests, improve soil fertility, and sustain production, often with limited external support. In parallel, the private sector has made significant advances in developing commercial organic and

Short overview of organic inputs

Organic inputs comprise a wide range of products used in agricultural production, including (but not limited to) organic fertilizers, biofertilizers, soil amendments, bio-stimulants, botanical pesticides and biopesticides. Definitions for three types of organic inputs are particularly relevant to this brief.

1 Organic fertilizers

Carbon-rich materials of biological origin (e.g. guano, livestock manures, compost, blood meal, vermicompost) used to supply plants with nutrients and/or improve soil structure.

2 Biopesticides

Pest management agents derived from natural materials (e.g. animals, plants, fungi, bacteria, certain minerals) used to disrupt or eliminate pests.

3 Ethnoveterinary medicine (EVM)

Encompasses the traditional knowledge, practices, and beliefs used by communities to care for and treat animal health issues.

bioinputs, offering farmers science-based, viable alternatives to fossil fuel-dependent agrochemicals. Critically, these innovations extend beyond crops: Kenya's livestock sector too faces growing threats from antibiotic overuse, which drives antimicrobial resistance and contaminates animal-source foods (Dharani et al. 2015). Organic dewormers, herbal tonics, and plant and insect-based feed additives offer practical, low-risk solutions to protect animal health while ensuring food safety. Among Kenya's smallholders, ethnoveterinary remedies using plants like neem and aloe vera are not fringe traditions; they are widely practiced, accessible and effective (Howland, 2021).

Organic and bioinputs — encompassing biopesticides, organic pesticides, biofertilizers, biostimulants, organic fertilizers, soil amendments, organic dewormers, herbal tonics and plant-based feed additives — represent a powerful opportunity to redefine the trajectory of Kenyan agriculture. Grounded in agroecological and regenerative principles, these solutions restore soil health, reduce toxic exposures for farmers and consumers, and build resilience to climate shocks. The potential is immense — yet it remains largely untapped.

What holds Kenya back is not a lack of solutions, but a failure of systems to fully embrace them. Outdated regulatory frameworks, fragmented institutional support, limited financing, weak market development, and a persistent undervaluing of farmer knowledge continue to block the scaling of organic and bioinput solutions. The disconnect between what many farmers already know works, and what formal systems are willing to recognize, validate, and promote, remains one of the most significant missed opportunities in Kenya's quest for sustainable agriculture.

The case for action is urgent and clear: scaling up organic and bioinputs is no longer optional — it is central to building a healthier, more resilient, and more inclusive food system for Kenya's future.

Evidence of impact: The transformative benefits of bioinputs

The evidence is overwhelming: organic and bioinputs are not marginal alternatives — they are essential tools for building a healthier, more resilient, and economically viable agricultural system for Kenya. They play a critical role in;

Protecting Ecosystems and Biodiversity: The unchecked use of toxic agrochemicals has taken a dangerous toll on Kenya's environment. Over 77 pesticide active ingredients still used in Kenya have already been banned in the European Union due to links with cancer, hormonal disruption, and devastating impacts on biodiversity (Route to Food Initiative & KOAN, 2020). Transitioning to bioinput-based agroecological systems offers a direct pathway to reverse this damage. By replacing hazardous chemicals with biopesticides and plant-based pest controls, farmers can safeguard the pollinators, beneficial insects, and microbial life that are the foundation of healthy and resilient ecosystems (FAO, 2021). Protecting biodiversity is not just an environmental goal — it is a prerequisite for stable food production in the face of growing climate shocks.

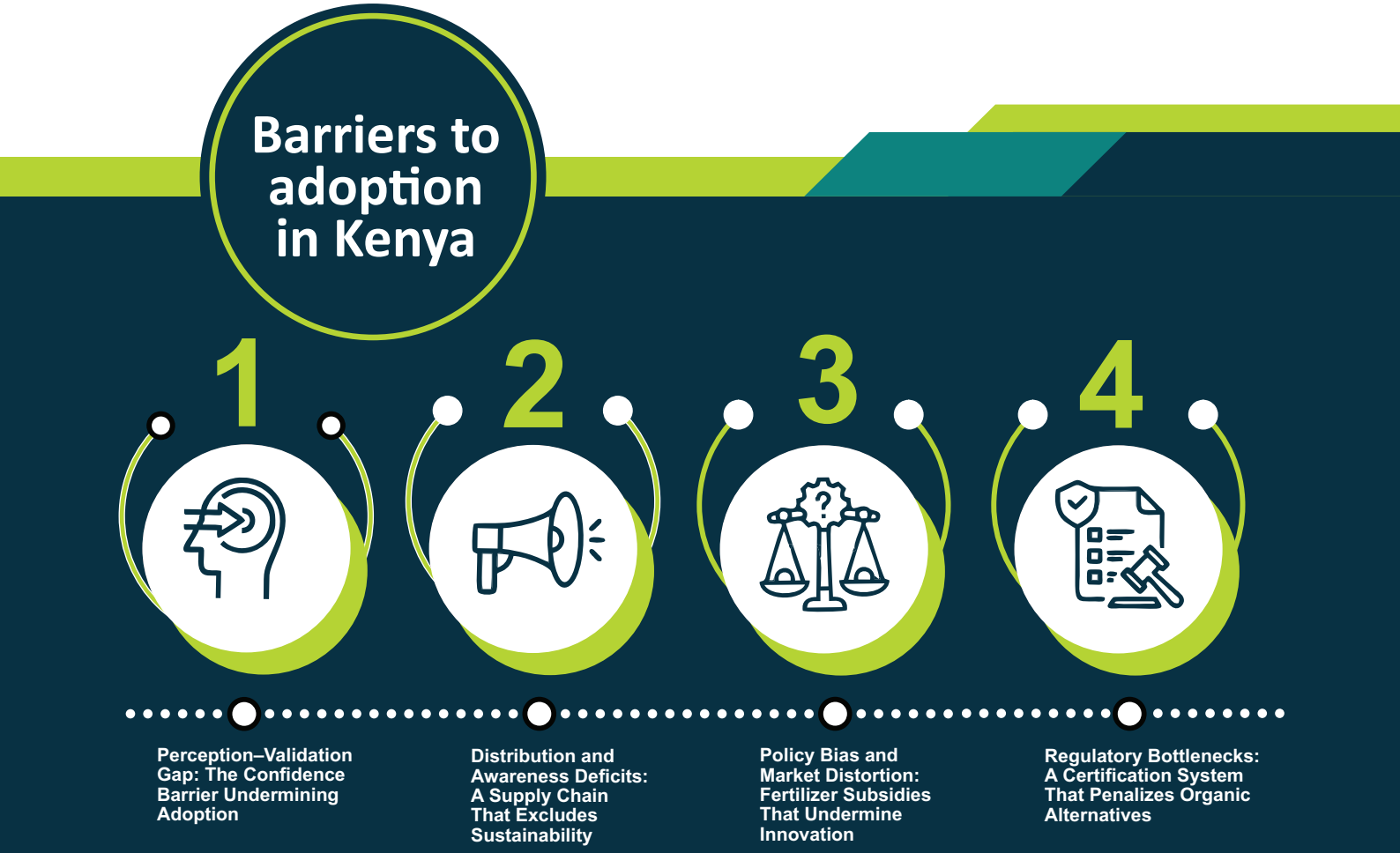
Restoring Soils and Building Climate Resilience: Kenya's soils — the lifeblood of its agricultural economy — are degrading at alarming rates, recent data from the Soil Atlas – Kenya Edition (2025) show that more than 40% of Kenya's soils are degraded, with just 20% of cropland remaining arable, and alarming soil loss rates of up to 26 t/ha per year (Heinrich Böll Foundation, 2025). Yet long-term trials offer hope: when farmers integrate compost, biofertilizers, and organic soil amendments, they dramatically improve soil structure, water retention, nutrient cycling, and carbon sequestration (IFOAM Organics International, 2022). In some trials, maize yields have more than

tripled under organic fertility management compared to conventional chemical-based systems (AFSA, 2022). Healthy, carbon-rich soils not only sustain higher productivity but also make farming systems more resilient to droughts and floods, providing a vital climate adaptation strategy.

Protecting Health and Boosting Farmer Incomes: Beyond ecological benefits, the human health gains from reducing synthetic pesticide and antibiotic exposure are equally profound. Pesticide poisoning contributes significantly to Kenya's rising burden of non-communicable diseases, including cancers and reproductive disorders (World Health Organization, 2020). By shifting to biopesticides and safer pest management solutions, farmers protect themselves, their families, and consumers from these silent killers. The economic case is equally strong: in mango production, for example, integrating biopesticides into fruit fly control prevented 19–55% of yield losses and raised net farmer incomes by 22–48% (Kibira et al., 2015; Muriithi et al., 2016). In livestock, the widespread use of ethnoveterinary remedies — including plant-based dewormers and tonics — has shown great promise in reducing antibiotic misuse, cutting the risk of antimicrobial resistance and harmful drug residues in animal-source foods (Howland, 2021).

Barriers to adoption in Kenya: Unlocking the full potential of bioinputs requires bold systemic reform.

Despite the compelling evidence of their benefits, the scaling of bioinputs in Kenya remains severely constrained — not by lack



of farmer interest, but by systemic policy, regulatory, institutional, financial, and perception-related obstacles that continue to favor chemical input models.

1. Perception–Validation Gap: The Confidence Barrier Undermining Adoption

A major obstacle to scaling bioinputs in Kenya lies in the deeply entrenched perception that organic alternatives are ineffective or unreliable. Farmers, having been exposed to decades of chemical-centric extension messaging, have come to associate productivity with the rapid visual impact of synthetic fertilizers and pesticides. In contrast, bioinputs—designed to work synergistically with natural systems—often deliver results more gradually, fostering skepticism among users accustomed to fast-acting effects.

This skepticism is reinforced by a persistent lack of robust, localized data validating the efficacy of bioinputs under diverse Kenyan farming conditions. Long-term field trials, cost-benefit analyses, and accessible demonstration plots remain sparse, particularly for emerging products. Without credible, science-based evidence and real-world success stories, many farmers—understandably risk-averse—are reluctant to adopt unfamiliar inputs.

The result is a widespread credibility gap: farmers remain locked into synthetic inputs not because alternatives are unavailable, but because the system has failed to generate and communicate the proof of concept needed to inspire trust and uptake.

2. Distribution and Awareness Deficits: A Supply Chain That Excludes Sustainability

Even where high-quality bioinputs exist, they remain largely inaccessible to the majority of farmers due to weak distribution systems. The commercial networks for organic fertilizers and biopesticides are fragmented, localized, and poorly integrated into mainstream agro-dealer channels. Many agro-dealers avoid stocking these products due to low visibility, limited technical knowledge, and concerns over unsold inventory.

This creates a vicious cycle: the absence of bioinputs on the shelf reinforces their invisibility, perpetuating dependence on synthetic alternatives that dominate rural input shops. Farmer interest is rising—yet a 2024 survey found that only 6.4% of Kenyan farmers had ever used commercial bioinputs (Biovision Foundation & Practical Action, 2024). Demand remains latent, products remain scarce, and confidence in the organic input market stagnates on both the supply and demand sides.

Public extension services further compound the challenge. Extension officers continue to prioritize and promote conventional input packages, with limited capacity to provide guidance on the safe and effective use of biofertilizers, compost, or biopesticides. Without empowered extension services or widespread awareness campaigns, farmers are left to navigate the shift to sustainable inputs without the support they need.

3. Policy Bias and Market Distortion: Fertilizer Subsidies That Undermine Innovation

Government subsidy programs—while designed to make inputs affordable—have unintentionally skewed the market in favor of synthetic fertilizers. Both the National Fertilizer Subsidy Program (NFSP) and various County Government Fertilizer Subsidy Programs exclusively subsidize fossil fuel–based inorganic fertilizers. Organic alternatives receive no equivalent financial or policy support.

This one-sided incentive regime limits farmer choice, undermines private sector investment and prevents organic fertilizer producers from achieving economies of scale. Meanwhile, farmers become increasingly

dependent on chemical inputs that may offer short-term yield gains at the expense of long-term soil health and environmental sustainability.

4. Regulatory Bottlenecks: A Certification System That Penalizes Organic Alternatives

Kenya's regulatory system for agricultural inputs is structurally biased against organic and bio-based products. The process for product registration and certification is prohibitively expensive and time-consuming.

A single product registration can cost over KES 1 million (registration fee, environmental impact assessment, efficacy trials and laboratory fees). Enterprises utilizing indigenous biological resources face further costs, including KES 500,000 in Access and Benefit Sharing (ABS) fees through the Kenya Wildlife Service, plus royalty obligations of 10–15% of annual revenue (ISFAA, 2025). These financial burdens lock out local innovators and SMEs, while multinationals continue to dominate the input space.

Delays in certification further impede market entry. Approval of organic fertilizers by the Kenya Bureau of Standards (KEBS) can take over five months as opposed to 36 days in their service charter, discouraging private sector innovation and investment.

Policy recommendations: Unlocking Kenya's bioinput potential requires decisive action

Kenya can no longer afford incremental reforms. Scaling organic and bioinputs demands bold, systemic policy interventions that dismantle outdated barriers, empower farmers, and unleash the full potential of regenerative agriculture. The following priority actions provide a clear roadmap:

1. Support validation of bioinputs through publicly funded, localized field trials, cost-benefit studies, and demonstration plots across agroecological zones.
2. Implement a nationwide multi-channel awareness campaign that highlights the alternative innovations to inorganic inputs, proven benefits, safe use, and economic opportunities of bioinputs.
3. Mainstream organic input knowledge in public extension services and train officers in sustainable practices such as composting and integrated pest management.
4. Expand input subsidy programs to include certified organic alternatives, starting with at least 10% of the budget and increasing progressively.
5. Provide targeted incentives for agro-dealers to stock and promote bioinputs, including tax rebates or partial cost-sharing mechanisms.
6. Mandate public institutions—such as county demo farms and agriculture training centers—to procure and showcase certified organic inputs to normalize their use.
7. Establish decentralized organic input production hubs at county and community levels to strengthen supply chains, reduce costs, and generate green jobs.
8. Offer financial and technical support to farmer-led, youth-led, and farmer-cooperative bioinput ventures to scale grassroots innovations.
9. Develop a streamlined, affordable regulatory framework for bioinputs and revise registration and ABS fees to level the playing field for local SMEs.
10. Promote digital platforms, e-commerce solutions, and innovative distribution models to connect farmers directly with certified bioinput suppliers.

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