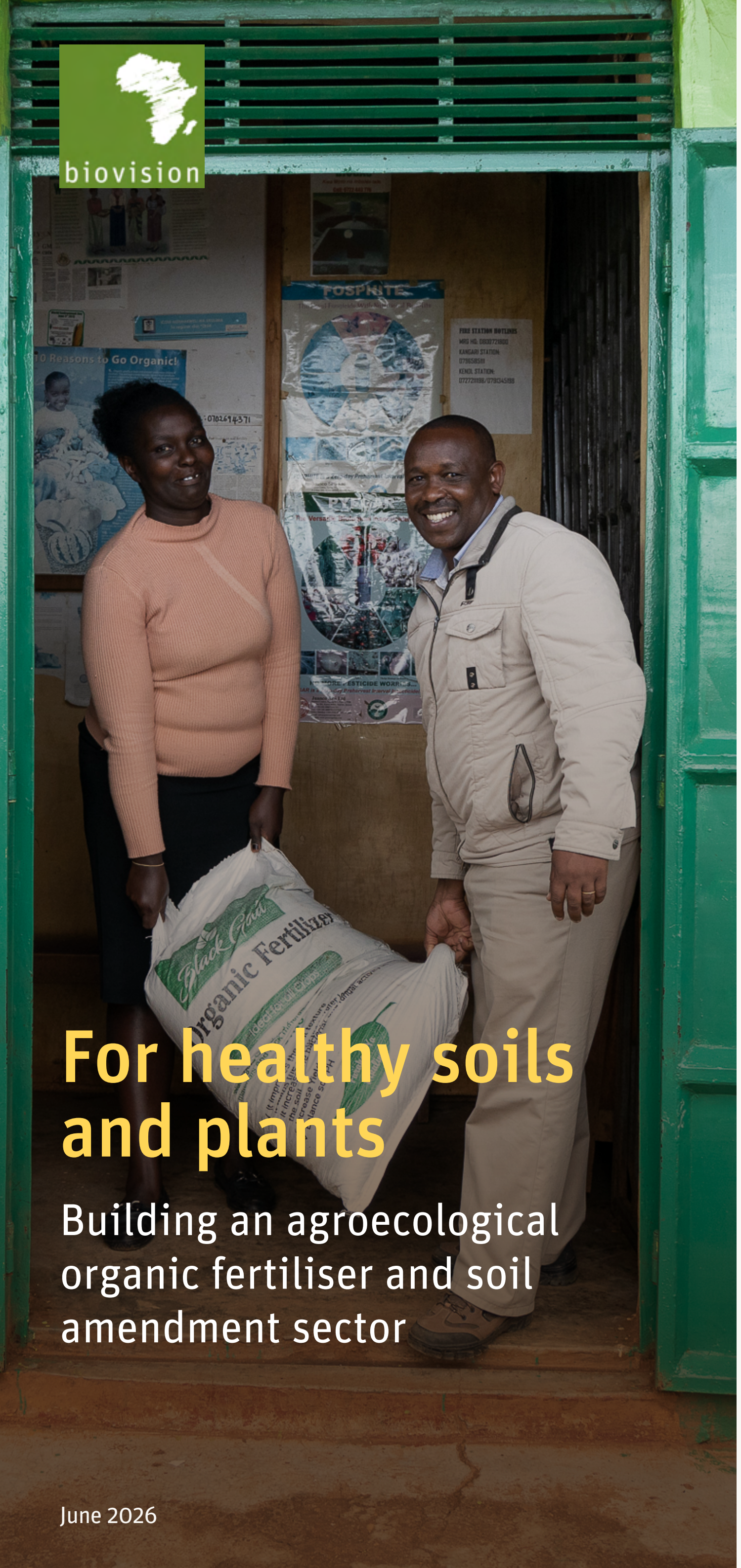


For healthy soils and plants

Building an agroecological organic fertiliser and soil amendment sector

June 2026

The challenge of declining soil health

Declining soil health is a central constraint to agricultural productivity, climate resilience, and food system sustainability worldwide. **An estimated one-third of the world's soils are degraded, with over 40 percent of this degradation occurring in Africa.**[1] This trend is rooted in historical shifts in agricultural practices, most notably the non-sustainable intensification during the last 60 years. Over time, soils have increasingly been treated like a substrate for crop production, with limited regard for the soil's health, i.e. its biological, chemical, and physical integrity.[2] **This has led to a conceptual divide often framed as "soil fertility" versus "soil health",** where soil fertility focuses mainly on supplying nutrients for plant growth, while soil health also includes the soil's long-term biological and physical functioning.

A key consequence of this has been a **growing dependence on synthetic fertilisers to maintain productivity.** While chemical fertiliser use in Africa remains lower than in many other regions and is often concentrated on cash crops such as cotton or sugar cane rather than subsistence crops like sorghum, African governments and international donors have invested heavily over the past two decades in subsidy schemes and development programmes aimed at increasing fertiliser use among smallholder farmers. As a result, fertiliser use has almost doubled compared to levels twenty years ago.[3] While chemical inputs have contributed to yield increases, they have also created structural dependencies: farmers face rising costs, price volatility, and vulnerability to global supply disruptions. In many contexts, this reliance has not addressed underlying soil degradation but instead masked it.

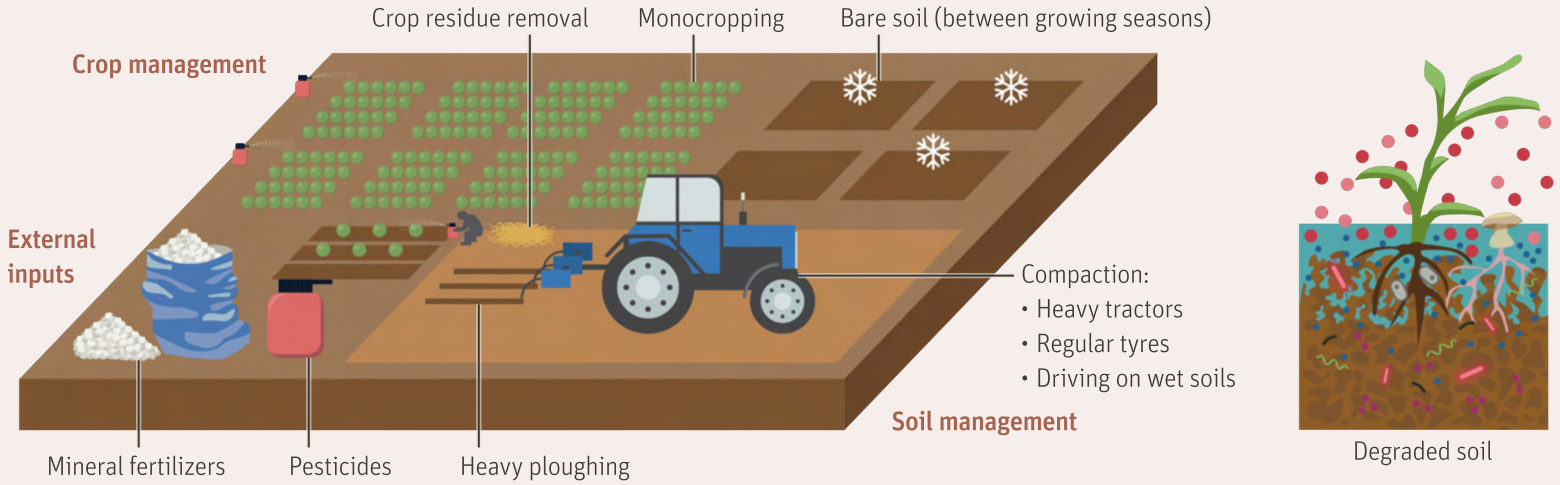
In response, there is **growing momentum,** and at times considerable hype, around **organic fertilisers and soil amendments.** This trend addresses legitimate concerns about soil degradation, environmental externalities, and import dependency. However, it also carries a familiar risk: **repeating the same product-focused quick-fix mistake seen with synthetic fertilisers,** where complex soil health challenges are reduced to the application of a single type of input. This risk is particularly pronounced in emerging markets for standardised, laboratory-produced biostimulants and biofertilisers, which are often promoted as scalable stand-alone solutions. Without appropriate safeguards, this emerging sector could also become prone to corporate concentration, limiting space for locally led enterprises, SMEs, cooperative-based models and farmer-centred solutions.

Integrated soil fertility management: a systems approach

Soil health cannot be achieved through products alone but requires an integrated approach. **Integrated Soil Fertility Management (ISFM)** combines organic inputs and, where necessary, mineral fertilisers with improved agronomic practices, all tailored to local conditions (see **Figure 1**). ISFM recognises that in many contexts, the availability of organic resources alone is insufficient to fully meet crop nutrient demands or close nutrient cycles. It therefore promotes a balanced approach in which specific agronomic practices and organic inputs are prioritised as the foundation for building soil health, and synthetic fertilisers are used strategically to complement them where gaps exist. Decisions on how to combine these inputs are made at farm level, considering local resource availability, soil conditions, and cropping systems. Where organic inputs are limited, their use may need to be prioritised for specific crops or production systems where they deliver the greatest benefit. By offering a diverse set of practices and input combinations, **ISFM provides a flexible framework to address context-specific soil fertility challenges while avoiding one-size-fits-all solutions.**

Building on this understanding, **this brief focuses** specifically on organic fertilisers and soil amendments: their types, functions, and potential. However, it emphasises that these inputs or products should not be considered in isolation. Their effectiveness depends on how they are embedded within ISFM strategies. **Positioning organic fertilisers and soil amendments as part of a broader, integrated approach enables them to contribute meaningfully to an agroecological transition of food systems,** strengthening local resource use, resilience, and sustainability without falling into the trap of one-size-fits-all solutions or becoming a "green substitute" for synthetic fertilisers. This brief therefore provides guidance on how actors can contribute to developing an agroecological organic fertiliser and soil amendment sector rooted in decentralised production systems that support soil health, farmer autonomy, and resilient food systems.

Conventional/industrial agriculture



Agroecological production with ISFM

What is ISFM?

Integrated soil fertility management (ISFM) is a holistic approach aimed at nurturing soil fertility and agricultural productivity sustainably.

Recognizing soil fertility as a dynamic and multifaceted system, ISFM acknowledges the interplay of diverse factors such as nutrient dynamics, organic matter content and soil structure and the symbiotic relationships between plants, soil organisms and microorganisms.[4]

Key principles in ISFM:

- ☑ Site specific management (depending on soil and agroecological conditions)
- ☑ Minimizing soil disturbance (e.g. minimum tillage)
- ☑ Crop rotation and diversity (crop mix and germplasms)
- ☑ Soil enhancing practices (cover crops, crop residue integration, fallow)
- ☑ Balancing nutrients (appropriate use and choice of organic and mineral inputs)
- ☑ Improved water use

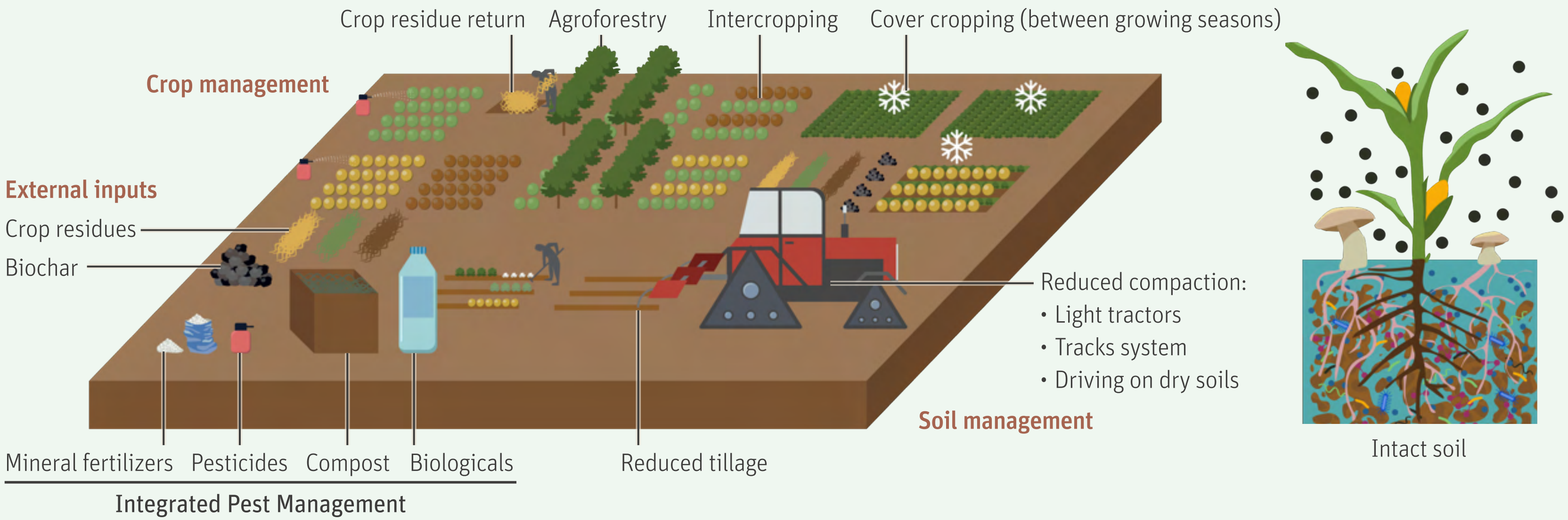


Figure 1. Key principles of Integrated Soil Fertility Management (ISFM).

Illustration adapted from Hartmann & Six (2023)[5]

Soil complexity and the functions of organic inputs

Soils are highly diverse, and the processes governing soil function and soil–plant interactions are complex, involving multiple interdependent factors. Moving beyond simplified narratives around soil fertility is therefore essential to capture the full picture of what sustains productive and healthy soils. In agroecosystems, three key dimensions are important: (1) **nutrient supply for plant growth and health;** (2) the **soil environment,** including living organisms such as bacteria and fungi, as well as factors that influence nutrient availability and biological activity; and (3) **soil organic matter (SOM),** which is fundamental to soil structure, water retention, and long-term nutrient cycling.

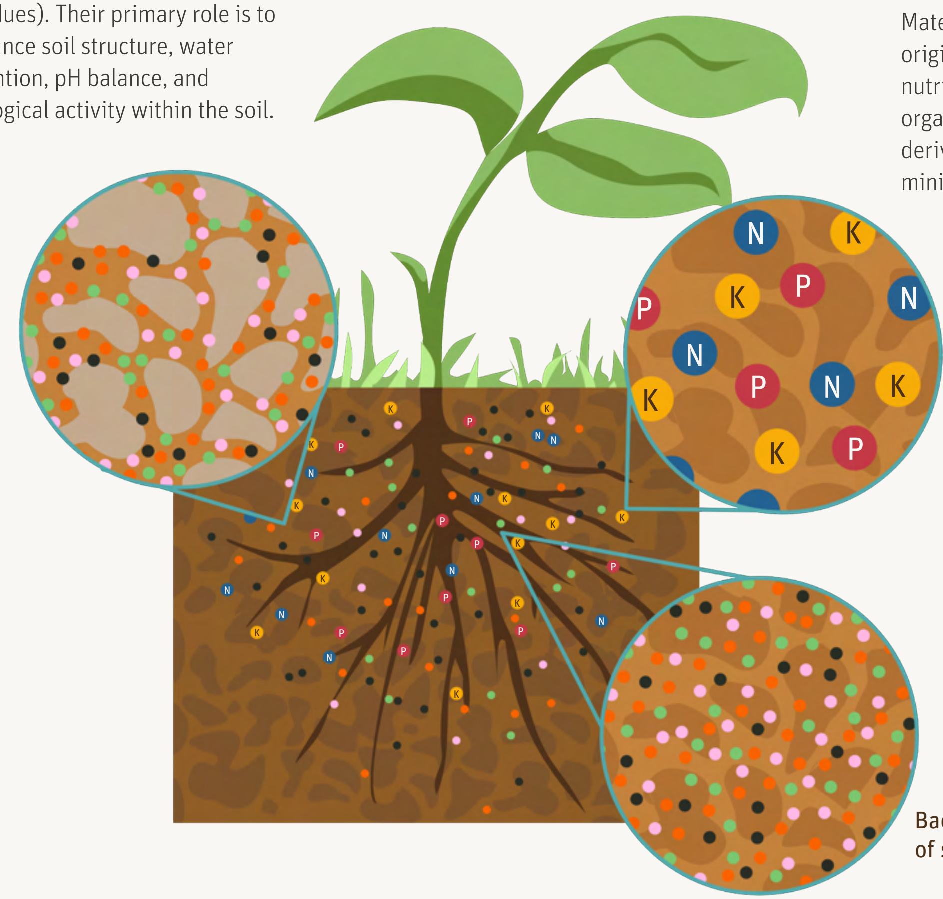
Different organic inputs contribute to these dimensions in distinct but complementary ways (see **Figure 2**). Some primarily supply nutrients that directly support plant growth (**plant-focused inputs**). Others enhance the soil environment by improving nutrient availability or stimulating biological activity (**soil-environment-focused inputs**), such as biostimulants. Still others contribute to building SOM, thereby improving soil structure and long-term soil health (**SOM-focused inputs**). Recognising these functional differences is critical for using inputs effectively and for managing expectations about what individual products can realistically achieve.

SOM-focused inputs

Materials applied mainly to improve soil organic matter (SOM) content in the soil, rather than deliver nutrients (e.g. compost, lime, gypsum, crop residues). Their primary role is to enhance soil structure, water retention, pH balance, and biological activity within the soil.

Plant-focused inputs

Materials of plant or animal origin used primarily to supply nutrients to plants. They contain organic carbon and biologically derived nutrients and must meet minimum nutrient thresholds.



Soil-environment-focused inputs

Materials that directly introduce beneficial microorganisms, such as bacteria and fungi or other biologically active elements, into the soil or onto plants. Rather than supplying nutrients directly, these inputs enable plants to access nutrients already present in the soil, strengthen root systems, and better cope with stresses such as drought, pests, or poor soil conditions. In simple terms, they support plant growth by activating natural soil and plant biological processes rather than supplying nutrients directly to the plant.

Figure 2. 'Mode of Action' of different organic inputs

Table 1. Overview of organic fertilisers and soil amendment products*.

Product	Focus: Plant	Focus: Soil-environment	Focus: SOM	Typical production level / Production Scale: On-farm production (decentralized, low-investment)	Typical production level / Production Scale: Collective production (community / cooperative)	Typical production level / Production Scale: Commercial production (specialized, market-oriented)	Considerations for agroecological small-scale farmers in Africa
Commercial Biofertilisers Beneficial bacteria, fungi, etc.	✓	✓				🏭	• Mainly liquid products, with short-term plant response, but no or little soil health improvements • Danger of being applied as substitute of synthetic fertilisers, without integration into ISFM • Manufactured in standardised process, mainly at commercial level • High cost of end-product • Mainly products manufactured by international corporations under their "organic fertiliser" product line
Commercial Biostimulants Commercial, formulated products, e.g. humic substances, protein hydrolysates, etc.	✓	✓				🏭	
Compost tea / worm tea / plant extracts etc.	✓	✓		⌂	⌂⌂		• Mainly liquid products, with short-term plant response, but no or little soil health improvements • Danger of being applied as substitute of synthetic fertilisers, without integration into ISFM • Manufactured on-farm or collectively • Includes a wide range of farmer-developed and locally adapted bio-inputs (fermented plant extracts, ash-based formulations, indigenous microbial inoculants, and traditional nutrient recycling practices) reflecting the importance of experiential and indigenous knowledge in agroecological innovation • Dependent on presence of livestock in the system (for liquid manure and bioslurry)
Liquid Manure	✓	✓		⌂	(⌂⌂)**		
Bioslurry (digestate)	✓	✓	✓	⌂	(⌂⌂)		
Sludge (faecal)	✓	✓		(⌂)	⌂⌂		• Requires appropriate treatment and strict safety measures to minimise health risks from pathogens and contaminants (their use can be restricted by law) • Closes nutrient cycles by returning nutrients from human waste to the soil
Solid manure	(✓)**	✓	✓	⌂	⌂⌂		• Dependent on presence of livestock in the farming system • Manure collection can be difficult, especially in free-grazing systems • Farmers may mix solid manure with plant materials or soil to create fermented or stabilized inputs that are easier to handle and can enhance biological activity and plant growth.
Insect Frass (Black Soldier Fly)	✓	(✓)		(⌂)	⌂⌂		• Medium and long-term soil health improvement (compost) and medium-term biological enhancement (vermicompost) • Multifunctional inputs that supply nutrients to crops, build soil organic matter, improve soil structure, and enhance biological activity • Farmer friendly manufacturing but labour intense, thus collective production more efficient, investment in infrastructure needed • Production can require larger biomass volumes, thus potential challenges related to the sustainability of the biomass sourcing, risk of nutrient mining, and competition with livestock feed systems
Vermicompost	✓	✓	✓	⌂	⌂⌂		
Bokashi	✓	✓	✓	⌂	⌂⌂		
Compost	(✓)	✓	✓	(⌂)	⌂⌂	(🏭)	
Biochar		✓	✓	(⌂)	⌂⌂		• Mainly enhances nutrient retention and biological activity • Farmer friendly but labour intense, thus collective production more efficient, investment in infrastructure needed • Production can require larger biomass volumes, thus potential challenges related to the sustainability of the biomass sourcing, risk of nutrient mining, and competition with livestock feed systems

* The products listed are among the most commonly used organic fertilisers and soil amendments, including both commercially produced inputs and farmer-developed practices based on local ecological knowledge. The list is not exhaustive but aims to illustrate the diversity of available inputs, their main functions, production modes, and key considerations for use in agroecological smallholder farming systems in Africa. A more detailed description of these products is available under Annex 1. ** Brackets represent weaker match with product focus or production level.

Annex 1

A wide variety of organic fertilisers and soil amendments exist, ranging from traditional farm-made preparations to commercially produced bio-inputs. **Table 1** provides an overview of some of the most commonly used products and their primary functions within the soil, including both commercially produced inputs and farmer-developed practices based on local ecological knowledge. The list is not exhaustive but aims to illustrate the diversity of available inputs. The table also gives an indication of the production levels at which these products are most commonly produced. Many of these inputs can be produced at farm level, although this is often labour- and time-intensive. In many cases, **cooperative models offer more efficient production and distribution.** At the same time, **a growing number of small and medium-sized enterprises (SMEs)** are active in this space, contributing to local value creation, job generation, and the development of circular resource flows.

Larger corporations are increasingly entering the market, often by developing dedicated “green”, “organic”, or “biological” product lines such as commercial biostimulants and biofertilisers. Many of these products are relatively easy to develop under laboratory conditions and can be distributed through existing agrovet and fertiliser supply chains, similar to chemical fertilisers. Their rapid market uptake reflects broader market dynamics that favour standardised, lab based inputs that are easier to scale, commercialise, and regulate. In contrast, more slowly acting, locally produced soil building inputs, tend to remain marginalised within formal input markets, despite their well documented long term benefits for soil health.

For this reason, **it is essential to understand these products as only one component of Integrated Soil Fertility Management (ISFM),** rather than as direct substitutes for synthetic fertilisers. They cannot replace the latter on a one to one basis but instead play complementary roles within broader strategies that combine organic resources, appropriate agronomic practices, and, where necessary, targeted mineral fertilisation.

Considerations for developing an agroecological organic fertiliser and soil amendment sector

The guidelines in pages 6-7 are organised around **seven interlinked pillars for developing a sector that supports plant growth and soil health.** The aim is to ensure that sector development is grounded in agroecological principles and guided by integrated soil fertility management (ISFM) at farm, landscape, and national levels. The recommendations are addressed to:

- ☑ **Bilateral donors and philanthropies** supporting projects on the use, production, distribution and scaling of these products.
- ☑ **Impact investors and financial institutions** offering capital to SMEs producing organic fertilisers and soil amendments, and to farmers adopting them as part of a broader transition to agroecological practices.
- ☑ **National or subnational government entities** supporting farmers through extension services, subsidy schemes, or policies to develop local SMEs in the sector.
- ☑ **Enterprises** producing organic fertilisers and/or soil amendments.
- ☑ **Non-state actors** coordinating on-farm or off-farm production projects, or advocate for policies that enable scaling of these products.

Considerations for developing an agroecological organic fertiliser and soil amendment sector

1 Building farmer trust through training, affordability and locally adapted solutions.

- Strengthen **farmer training and knowledge exchange** on production and application of organic fertiliser and soil amendments by embedding programmes within farmer-to-farmers networks and extension services to build local expertise and trust, with a special **focus on locally produced products and their affordability.**
- Prioritise cost-effective and reliable products with low production costs and stable performance, **ensuring affordability for farmers and reducing economic risks** through predictable and proven effectiveness.
- Ensure the **coexistence** of on-farm and off-farm manufactured organic fertiliser and soil amendment products (replicability, open-access formulation).

2 Support environmentally safe products.

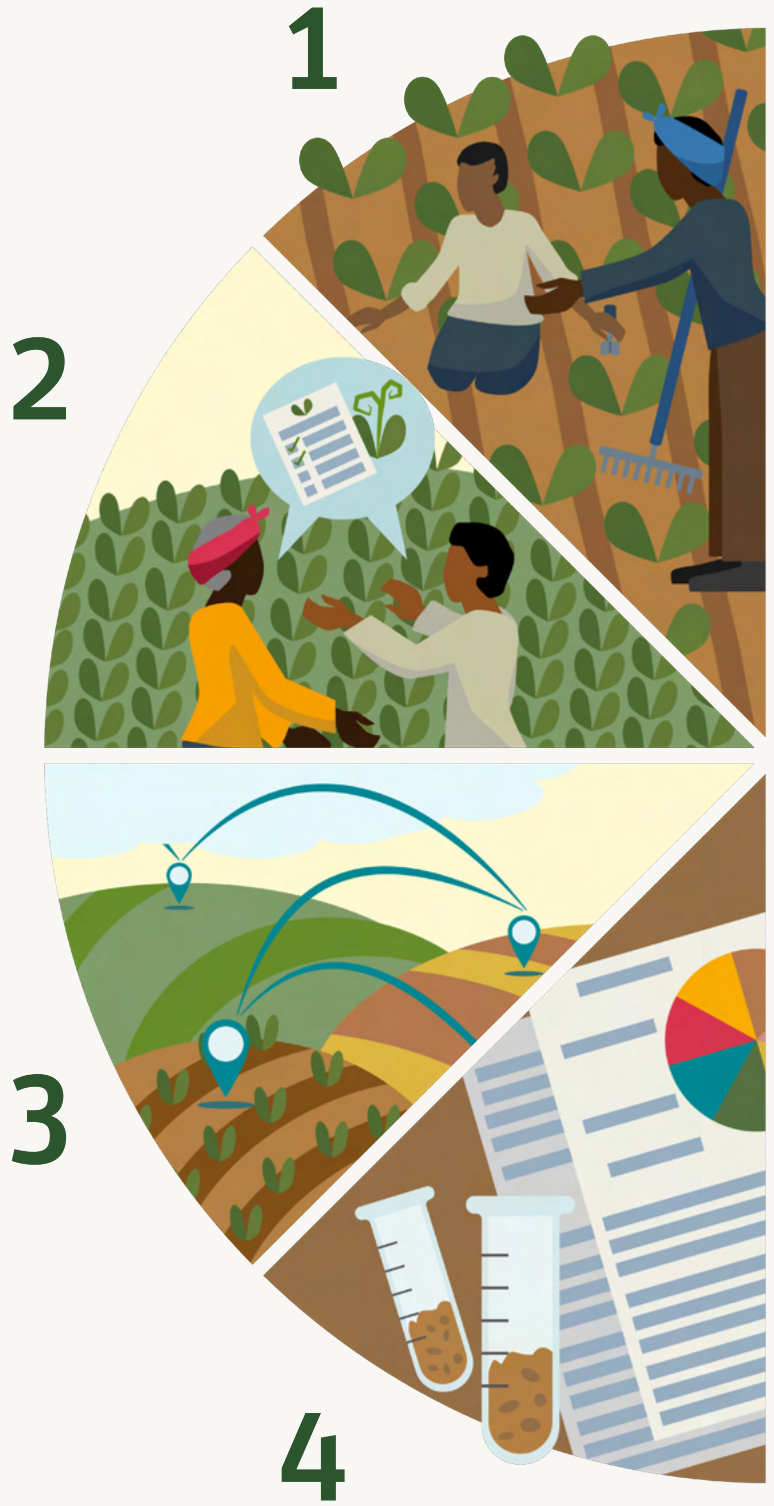
- Prioritise organic fertiliser and soil amendment products with **low or well-known environmental and health risks** and apply precautionary principles where risks are uncertain, including through proportionate ecological and health risk assessments. The chosen solutions should in particular minimise water contamination and additional greenhouse gas emissions, while maximising bioavailability of nutrients, and preserving natural predators, beneficial species and soil biota.
- Accompany production of **on-farm solutions** through **adequate training, with clear protocols** to prevent risks to human and animal health through contamination or proliferation of diseases, especially under conditions of improper use or exposure.

3 Encourage circularity and landscape-level collaboration.

- Promote circular and resource-efficient production by incentivising the use of **locally sourced materials** (e.g. agricultural residues, food factory waste, household and market waste) and supporting partnerships between organic fertilisers and soil amendments producers and other agroecological enterprises.
- Test economic instruments such as **landfill taxes and pay-as-you-throw (PAYT)** waste fees to incentivise recycling and production of organic fertilisers and soil amendments (see also pillar 6).
- Promote production of non-productive biomass (e.g. hedges) on farms to increase **on-farm availability of organic material** to alleviate pressure on biomass resources.

4 Data-driven and locally adapted soil fertility management.

- Deploy **landscape-wide soil health testing infrastructure** for farmer cooperatives and networks in collaboration with local extension services to facilitate more targeted and efficient use of organic fertilisers and soil amendments. This deployment should prioritise low-cost soil diagnostic tools and approaches and complement laboratory testing infrastructure for formal registration of products and quality testing.
- Train farmers to apply **targeted** organic fertiliser and soil amendment solutions according to **soil characteristics** based on data from soil health testing infrastructure.
- Foster development of products that are **adapted to different soil types, different crop growth stages and different crops.** Conduct product testing in collaboration with farmers to integrate their local knowledge and constraints.



5 Strengthening local enterprises and fair markets.

- Build resilient and diversified supply chains and reduce dependency on imports by supporting **locally developed and locally led enterprises** (ranging from subnational to regional scope). To do so, prioritise SMEs and cooperative-based business models through incubators, accelerator programmes, public procurement, extension services and access to subsidy schemes for their products and related training. Ensure support also reaches enterprises that involve youth, local communities and gender-responsive business models.
- Incentivize companies to consider smallholders' barriers and capital constraints, **ensuring products are compatible with the realities of small-scale farming,** including available labour, packaging size, farm equipment, storage facilities, irrigation systems, and local land tenure arrangements, through targeted requirements in investments funds or through public support schemes.
- Ensure competition policies and anti-trust regulations **prevent corporate capture and market monopolies** by first strengthening regulatory authorities' understanding of the sector, including market structure and concentration risks. Based on this, regulate mergers and acquisitions by external large agribusinesses, supporting regional competition authorities, and protecting SMEs from unfair international acquisitions or distorted competition from imports.

6 Build decentralised waste, storage and distribution systems for organic fertilisers and soil amendments.

- In collaboration with public authorities, for example municipalities giving access to land, equipment or financial support such as gate fees, strengthen and maintain decentralised **collective waste management and composting infrastructure** that separates organic and inorganic waste at the source. This infrastructure should recycle organic streams, including agricultural residues, market and household waste, for production of high-quality organic fertilisers and soil amendments, and dispose inorganic waste safely. Geographic proximity to farming communities and local SMEs is key to reduce logistic expenses linked to bulkiness of organic material.
- Ensure local **farming communities and cooperatives have access** to recycled organic waste. Additionally, collective waste management and composting infrastructure should prioritise closing regional nutrient cycles through business-oriented models while avoiding new dependencies, including the capture of on-farm biomass.
- Develop **last-mile distribution systems that ensure universal access** to organic fertilisers and soil amendments taking into account short shelf-life of some products. Empower farmer cooperatives or Participatory Guarantee Systems (PGS) groups to serve as distribution networks and extension or knowledge platforms, and strengthen road networks to reduce the transport costs of raw materials needed for production.
- Develop **storage infrastructure** to improve product accessibility and quality.

7 Support tailored regulatory pathways for safe, trusted and consistently effective organic fertilisers and soil amendments.

- Ensure that off-farm manufactured organic fertilisers and soil amendments are **rigorously tested for safety and quality** to detect and respond to potential abuses and to build trust.
- Develop **adapted, differentiated and transparent regulatory mechanisms:** for instance, consultative regulatory mechanisms to evaluate and approve organic fertilisers and soil amendments based on the nature of the product (e.g. insect frass), reduced bureaucratic costs related to registration/homologation for SMEs and transparency on regulatory steps required.
- Strengthen **transparency and traceability** of the origin, composition, efficiency and impacts of products (e.g. through participatory certification, locally accessible platforms).

Case Study 1: Organic Kenya Limited – an SME committed to improving soil health and supporting smallholder farmers

Organic Kenya Limited (OKL) is an SME based in Kirinyaga County that started its operations in 2020, **producing organic fertilisers and soil amendments for over 5,000 smallholder farmers** in over 10 counties. The enterprise's core objective is to make Kenyan farms more resilient through access to locally produced organic inputs.

The company **sources locally available biomass**, including manure **from pastoralist communities** and organic waste from **local food processing plants** (notably avocado oil and rice husking plants) with a total of 20,000 tonnes of waste diverted already. Its key products include the granular organic fertiliser Black Gold, supplying N, P and K (plant-focused input), and a liquid soil conditioner (SOC focused input) that improves soil structure and microbial activity, made from cow urine and nutrient rich local plants. OKL **distributes directly to farmers, cooperatives** and uses village based agronomists that ensure local anchorage and knowledge transmission on accurate product usage, complemented by municipal depots. OKL's distribution network is 80% composed of women. Finally, OKL also provides **farmer training** through its Popular Education Model that supports **locally co-developed solutions and reduces dependency** on imported chemical fertilisers.

Case Study 2: Farmer-produced soil and plant-focused inputs in Vihiga County, Kenya

Vihiga County is one of the most densely populated rural areas in Kenya. Average farm sizes are very small—around **0.4 hectares per household**—leaving little room for area expansion or fallow periods. In this context, farmers rely on **biological and ecological intensification** rather than high external inputs, focusing on nutrient recycling, soil life, and locally available resources.

To sustain productivity on limited land, farmers produce several inputs directly on farm. One key practice is **vermicomposting using red wigglers,** which convert household and farm organic waste (excluding materials harmful to worms such as citrus, onions, and dairy products) into nutrient rich compost. Red wigglers are well suited to smallholder systems due to their fast reproduction and resilience. The **solid vermicompost** is applied at planting, while the **liquid fraction ("worm tea")** is used as a foliar fertiliser.

Farmers also prepare a **locally made biostimulant** by mixing cow dung, urine, molasses, bean dust, and a handful of soil. The mixture is shaped into compact balls that are easy to handle and apply. These are placed in planting holes for crops such as maize, beans, and kale, providing a slow release nutrient and biological boost suited to crops with longer growth cycles.

Together, these practices allow farmers to **intensify production on very small plots,** reduce dependence on purchased inputs, and build soil fertility through locally controlled, low cost solutions.

Conclusion

Organic fertilisers and soil amendments can help restore soil health, strengthen local economies and build more resilient food systems, but only if they are developed as part of broader agroecological strategies, not as stand-alone inputs or simple "green substitutes" for synthetic fertilisers.

Sector development should be integrated into landscape-level Integrated Soil Fertility Management (ISFM), recognising the role of organic products within diversified agroecosystems. The seven interlinked pillars outlined in this brief provide a pathway for doing so by: building farmer trust, ensuring environmental safety, promoting circularity, strengthening soil testing and local adaptation, supporting fair markets, investing in decentralised infrastructure, and creating tailored regulatory pathways.

Policymakers, impact-oriented investors and development partners should act now to shape this emerging sector around farmer-centred solutions, local enterprises, cooperative models and circular resource use, while avoiding new dependencies and market concentration.

Endnotes

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