

POLICY BRIEF

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Soil Health on the African Continent



In brief

Agriculture and food systems are both driver and victim of escalating climate and nature crises, in turn increasing the risks to healthy diets, livelihoods and economies. Public policies often set incentives for farming and market practices that further exacerbate these trends but can also play a role in reversing them. The global Policy Dialogue on Transitions to Sustainable Agriculture is a peer-to-peer platform to share experience, facilitate partnerships and catalyse policy leadership to accelerate transition to sustainable agriculture and food systems that benefit people, prosperity and the planet.

Policy Pathway Briefs provide an overview of emerging experiences and lessons on policy approaches that contribute to this transition, on a series of topics requested by Policy Dialogue members. We recognise that the briefs are in no way exhaustive and that options facing governments look very different across and within countries. They aim to act as a discussion starter and facilitate exchanges between Policy Dialogue members, drawing on the experiences presented by Dialogue members and examples that are identified through further research.

This Brief focuses on soil health on the African Continent, drawing on discussions with senior government officials from Ministries of Agriculture across Africa, who convened in Kigali as part of the Policy Dialogue series in September 2024 to discuss issues related to the implementation of the Africa Fertilizer and Soil Health Action Plan. This Policy Dialogue aimed to: identify policy action to incentivize and support the improvement of soil health and environmentally sustainable fertilizer use, including fertilizer subsidy reform programs; and share lessons learned, challenges and opportunities for policy reform to enhance effectiveness of fertilizer support and other public programs on soil health and sustainability.

Key messages

- In many countries around the world, unsustainable agricultural practices have increased soil erosion and weakened other aspect of soil health, undermining soils' ability to sustain the productivity, diversity and environmental services of terrestrial ecosystems.
- Despite having areas of high soil fertility, many of the global challenges to soil health are even more accentuated in Africa, particularly in sub-Saharan Africa, undermining livelihoods and efforts to combat poverty.
- Low agricultural productivity and fertilizer use compared to other regions of the world have driven an emphasis on the need to improve availability and access to fertilizers for smallholder farmers in Africa, often using broad-based subsidies for generalised fertilizer mixes.
- However, over the last two decades, African governments have moved from a primary focus on increasing fertilizer use to a more comprehensive and integrated soil health strategy, which emphasises sustainable soil health management and improved fertilizer use, tailored to local contexts.
- Key elements of this strategy include reorienting public finance and attracting more private funds to support:
 - Comprehensive, accessible and digitised soil information systems to prioritise, target and track interventions to boost soil health, and building capacity to use those systems.
 - Extension services that support both farmers and pastoralists in context-specific techniques for soil health and fertilizer management, using both inorganic and organic fertilizers as part of an integrated soil management approach.
 - More targeted financial measures to underpin efficient fertilizer use by those who could benefit most.
 - Working across countries to share experiences, successes and lessons on soil health restoration, demonstrating the economic and environmental benefits.

Background

The importance of healthy soils for people, climate and nature

Healthy soils provide the basis for food production and vital ecosystem services, including flood regulation, nutrient cycling and carbon sequestration. As such, soil health underpins goals of food and nutrition security, improving livelihoods, addressing climate change mitigation and adaptation, and enhancing biodiversity both above and below ground (Lal et al., 2021).

Understanding soil health

Healthy soil has the ability to “sustain the productivity, diversity and environmental services of terrestrial ecosystems” (ITPS FAO, 2020). It is also key to carbon storage: through restorative land management practices, carbon sequestration in the soil can offset 15% of global fossil-fuel emissions (Lal, 2004). However, it is estimated that soil and land degradation negatively impact 3.2 billion people annually (Balvanera and Pfaff, 2019)

Topsoil erosion is the most widespread form of soil and land degradation (Vågen and Winowiecki, 2019) and this is also the most widely used metric of soil health for global comparison. Other indicators of soil health include the degree of preservation of above and below-ground biodiversity, nutrient balance (fertility), pollution, salinity, acidity, compaction and sealing, water regulation and soil organic carbon (SOC), all of which provide a set of ecosystem services.

The challenges facing soil health

Loss of topsoil from agricultural fields through unsustainable agricultural practicesⁱ is estimated to be more than 100 times higher than the soil formation rate under conventional tillage systems (IPCC, 2019).

Globally, soil erosion from cropland results in the loss of 17 billion tons of topsoil each year. This causes farmers to forego the equivalent of US\$300 billion in agriculture production annually (Borrelli *et al.*, 2017), as productivity falls and farmers have to turn increasingly to mineral fertilizers to bolster yields. In turn, degraded soils are less responsive to inorganic fertilizers, creating a vicious cycle (Lal, R. 2006). This has resulted in a triple cost of increased GHG emissions from agricultural production, reduced biodiversity of croplands and weakened resilience of agriculture to shocks and stresses, undermining food security and farmer livelihoods, and climate and nature goals.

Despite having areas of high soil fertility, many of the global challenges to soil health are more accentuated in Africa. Soil degradation affects 65% of cropland, 30% of grazing land and 20% of forest land (Montpellier Panel, 2014). The situation in sub-Saharan Africa (SSA) is particularly acute: it harbours one-fifth of human-induced degraded land, affecting 330 mn has, or 14% of the SSA region, compared 4% of Northern Africa (FAO, 2021a).

Soils in many parts of Africa are losing nutrients at a high rate, much greater than the levels of fertiliser inputs applied (European Commission, 2014) compounded by loss of organic matter, salinization and pollution (Lal and Stewart, 2019). Since the 1950s, Africa has lost about 20% of its soil productivity irreversibly due to degradation, driven mainly by anthropogenic – and principally agriculturally related – causes, such as population growth, inappropriate land use, poor soil management, deforestation and overgrazing (ibid). Climate change, desertification and land mismanagement further threaten soil health, reducing agricultural productivity and food security (Trisos *et al.*, 2022).

The Promoting Healthy Soils and Land policy brief (Just Rural Transition *et al.*, 2023) identified several barriers and disincentives to farmers taking concrete measures to protect and enhance soil health – including financial constraints and opportunity costs, lag times in seeing benefits from investments in soil health, and lack of affordable and accurate data information on soil health.

These can be particularly pronounced in many African countries and are exacerbated by several underlying issues that make it hard to identify context-specific recommendations for soil health and fertilizer management. Challenges include weak institutional capacity to design and implement effective soil health policies, as well as the limited adoption of digital technologies to monitor and manage soil conditions. Many African governments struggle with policy implementation due to inadequate funding and technical expertise, and lack of coordination between stakeholders (Tetteh, F.M. 2021). Additionally, digital solutions – such as soil health mapping and data-driven decision-making tools – remain underutilized, largely due to infrastructural limitations, lack of internet access in rural areas, and insufficient training for farmers on how to use these technologies effectively (Tsan *et al.*, 2019). Some African countries also have large areas of rangelands and pastoral communities, which often experience extreme weather events, and their resilience depends on the health of the ecosystem. However, they are not typically represented in broader debates on soil health, restricting policy makers’ ability to draw on existing evidence.

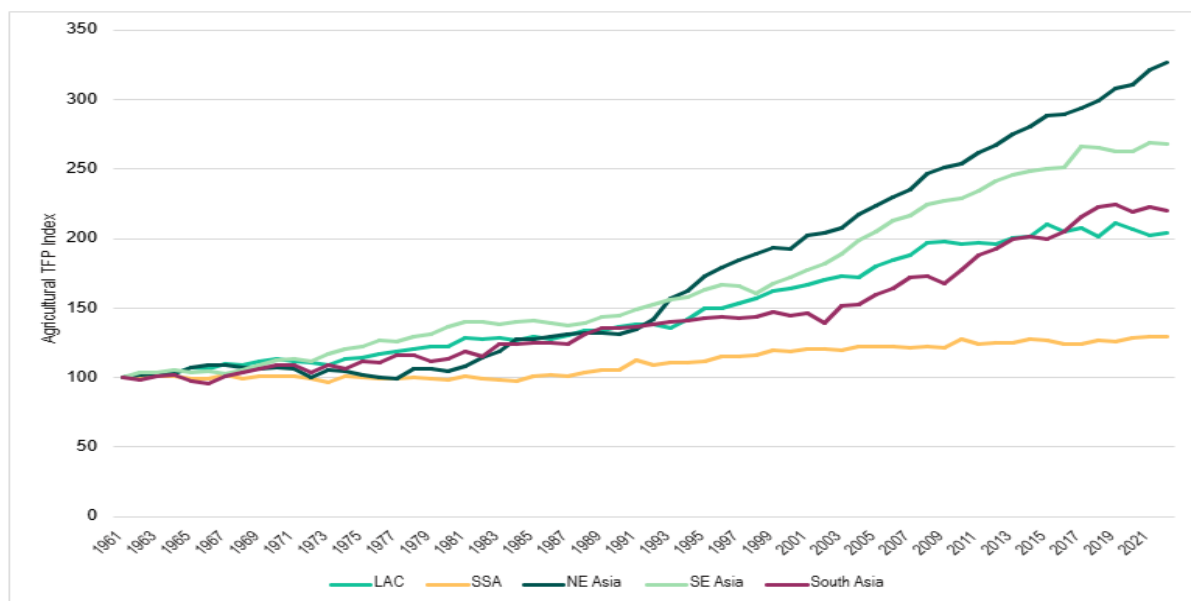
Emerging responses on the African Continent

The Productivity and Fertilizer Question

In many African countries, especially in SSA, poor agricultural productivity is seen as the main bottleneck to improving production and livelihoods (Jayne and Sanchez, 2021)¹ lags far behind other regions and has fallen further behind over time (Figure 1) and average cereal yields have remained almost flat over the last 60 years.

¹ Total Factor Productivity measures how efficiently all inputs – such as labour, land and capital – are used to produce output, showing the impact of innovation, technology, and better practices on economic growth beyond simply increasing inputs.

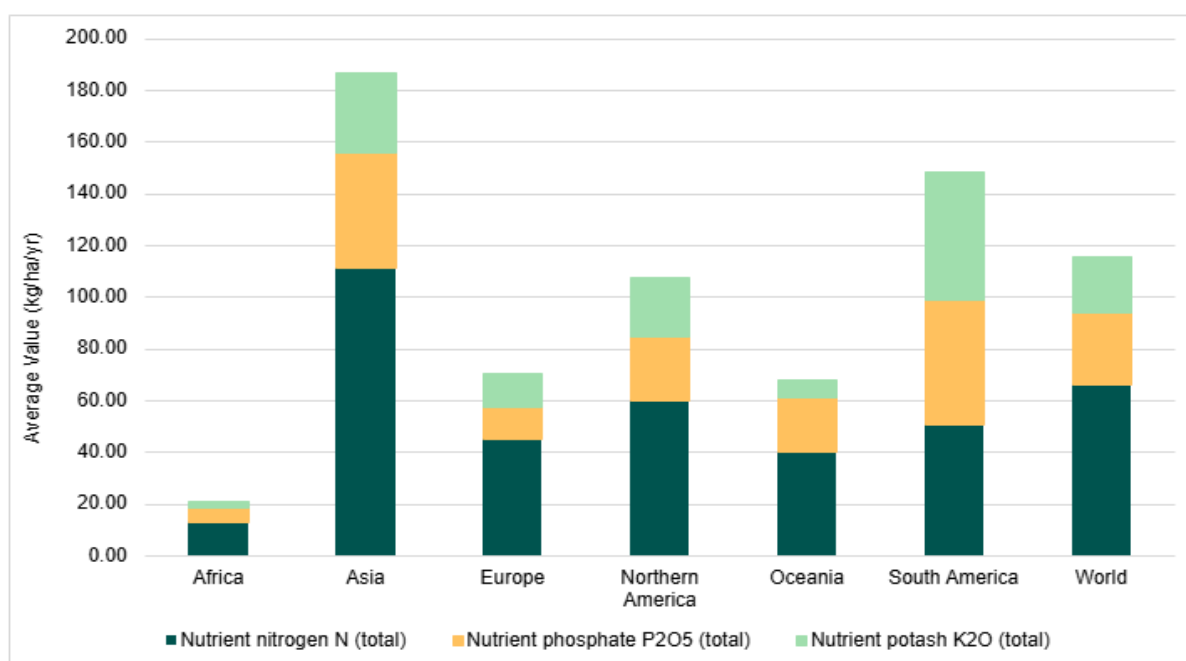
Figure 1: Agricultural Total Factor Productivity Index, by Region, 1961-2022



Source: FAOSTAT

Low fertilizer use is seen as a major contributor to poor productivity (Figure 2). Where fertilizer is available and affordable – often made so through government subsidies – the nutrient mix may not be tailored for local soils nor targeted at the farmers that need them the most leading to inefficient use (Hemming *et al.*, 2018). Not only do expected yield improvements not emerge or be sustained; soil can be further degraded by inappropriate use (Abay *et al.*, 2020).

Figure 2: Comparative Fertilizer Use on Cropland across Regions, 2010-2022



Source: FAOSTAT

This situation led African governments in the past to focus on measures to boost the availability and accessibility of fertilizers for smallholders as the main pathway to improving productivity, particularly through fertilizer subsidies.

However, over the last two decades, African governments have moved from a primary focus on increasing fertilizer use to a more comprehensive and integrated soil health strategy. While governments continue to highlight the need for improved access and affordability of fertilizer for smallholder farmers, strategies have evolved that also emphasise sustainable soil health management and improved fertilizer use, tailored to local contexts. This change is reflected in policy commitments and regional declarations.

Policy Commitments and Regional Declarations

The 2006 **Abuja Declaration**, issued at the African Green Revolution Summit in Abuja, Nigeria, set a target of 50 kg of nutrients per hectare and focused almost exclusively on measures to reduce the cost of fertilizer procurement at national and regional levels, including via subsidies and promoting national/regional fertilizer production and intra-regional fertilizer trade. African Union leaders also established the **Africa Fertilizer Financing Mechanism**, a special fund administered by the African Development Bank Group to provide finance to accelerate the use of fertilizers in Africa and improve agricultural productivity in the Bank's regional member countries (African Development Bank Group, nd). The Declaration mentioned actions needed to improve farmer access to other inputs, and soil nutrient testing and mapping to facilitate effective and efficient use of inorganic and organic fertilizers, "while paying attention to the environment" (African Development Bank, nd). However, this was not backed up by the same financial support as offered to fertilizer.

"We have witnessed in our country that fertilizer alone cannot sustain increased agricultural productivity and production...maize yields have stagnated despite increased fertilizer use."

H.E. Dr. Musalia Mudavadi, Kenya's Prime Cabinet Secretary and Cabinet Secretary for Foreign and Diaspora Affairs at the AFSH 2024

More recently, continental efforts have shifted to accommodate a more systematic approach to improving soil health and productivity. This recognised the limits of concentrating solely on increasing fertilizer use to boost and sustain productivity without adopting other measures to improve soil health, such as augmenting organic matter content in soil to increase water holding capacity, cation exchange capacity, improved soil structure and nutrient uptake:

- The **2020 Soil Initiative for Africa (SIA)** promotes measures to **improve soil health alongside balanced and efficient fertilizer application**, combining organic and inorganic sources. The initiative incorporates fertilizer strategies into its framework, unlike past efforts that often treated soil health and fertilizer access separately. SIA made an explicit effort to demonstrate the economic

impact of soil degradation to policymakers to raise the profile of measures to boost soil health in national development agendas (FAO, 2021b).

- The recent **Africa Fertilizer and Soil Health (AFSH) Summit (2024)** reaffirmed commitments to enhance fertilizer use (African Union, 2024a) given that most African countries have remained below the benchmark set by the Abuja Declaration. However, it promoted a **more holistic approach to enhance soil preservation**, restoration, and sustainable agricultural practices across Africa. The **2024 Nairobi Declaration on Fertilizer and Soil Health** adopted during the Summit introduced 13 commitments, including tripling domestic fertilizer production, ensuring 70% of smallholder farmers receive targeted agronomic recommendations from public and private service providers, restoring 30% of degraded lands, and mobilizing financial and technical resources for soil health improvements to improve food security and climate resilience on the continent (African Union, 2024b).
- During the AU's Extraordinary Summit in Kampala, the Kampala Declaration of 2025 also touched on soil health as part of its broader agenda. Discussions highlighted the importance of **addressing soil degradation, promoting sustainable land use, and improving soil fertility** as key components of agricultural transformation.

Feedback from Policy Dialogue participants

This direction was endorsed by participants in the Kigali Policy Dialogue who emphasised the need for policy measures and finance to support:

- Comprehensive, accessible soil information systems to prioritise, target and track interventions, including scaling of systematic soil sampling and testing and accurate soil mapping that is stored for easy retrieval and use in analysis. This could provide a basis for the private sector to become more involved in providing services to farmers by documenting demand for fertilizer and sustainable soil health practices, and allow countries to make more informed decisions about crop choice.
 - In **Rwanda**, the Rwanda Agricultural Board aims to provide an open-access soil information system populated with data on basic soil properties, analysed using soil spectroscopy, an innovation to assess multiple soil properties simultaneously.
 - The **Ghana** Agriculture and Agribusiness Platform (GAAP) aims to centralize data and information on a digital platform on weather data, soil and fertility mapping, and a digital database recording farmers' cropping decisions.
- Building capacity of African scientists to manage soil databases and undertake analysis.
 - For example, **Ethiopia** developed an open access web platform to display data from EthioSIS. They will continue to update these datasets to provide spatially explicit information to decision makers.

- Extension services providing context-specific recommendations for soil health and fertilizer management to farmers, promoting the use of both inorganic and organic fertilizers as part of an integrated soil management approach.
 - **Tanzania** has finalized their Agricultural Master Plan, a key roadmap for agricultural transformation across the country, with elements of strengthening soil information systems, to investing in soil health management strategies, and strengthening partnerships and collaboration, internally across national sectors and internationally.
- Including rangeland management and soil health in rangelands in information systems and extension support to improve pastoralist soil management techniques.
 - In **Kenya**, there is a growing recognition of the critical role of rangeland systems, for livelihoods and landscapes. Several governmental and non-governmental programmes targeting rangeland restoration aim to address the underlying causes of degradation.
- More targeted financial public support to make use of limited government funds to underpin efficient fertilizer use, for example, using e-voucher systems for fertilizer subsidies to help cut back leakage (where implemented well).
 - In **Malawi**, the government is reforming the Agricultural Inputs Program to reduce funding on inorganic fertilizer subsidies and discussions are ongoing as how to redirect finance to rewarding farmers for soil health outcomes.

Participants also emphasised the need for sharing information, experiences and lessons across countries with champion countries stepping forward to showcase the economic and environmental case for soil health restoration.

Process considerations

Policy Dialogue discussions acknowledge that a transition to low emission, climate resilient agriculture practices needs to centre on people and engage stakeholders at all stages. This recognizes that stakeholders have vested interests, may have a significant stake in existing agriculture production systems or stand to lose from changes in the short term. It is important to engage stakeholders in policy design – rather than imposing policy on them – to ensure that proposals are feasible, take account of risk appetite and support equitable change to more sustainable practices that benefit everyone.

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