Climate change adaptation

Emerging insights and perspectives for advancing the transformation of Africa's seed sector

ISSD AFRICA BRIEFS:

BRIEF 1: Terminology
BRIEF 2: Initiative
BRIEFS 3-7: Five ambitions
BRIEF 8: Enabling environment

BRIEF 6

Ambition

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Integrated Seed Sector Development in Africa (ISSD Africa) is an international Community of Practice (CoP) working to alleviate the problem of farmers' limited access to quality seed. Its vision is a vibrant, pluralistic, and market-oriented seed sector in Africa. The CoP unites diverse organizations that are inspired in their work by ISSD's guiding principles; they promote pluralism in the seed sector, recognize the value of formal, intermediary, and informal seed systems, take an evidence-driven approach, and pursue multiple desired food system and seed sector outcomes.

This document supports and complements the third ISSD communiqué. It is one in a series of eight briefs. **Brief 1 – Terminology**, defines the foundational concepts informing the communiqué and accompanying briefs. **Brief 2 – Initiative**, introduces ISSD Africa, the ISSD Africa Conference, and their association with the African Seed and Biotechnology Programme of the African Union Commission. **Briefs 3-7** capture the **five ambitions** for seed sector transformation in Africa. **Brief 8 – Enabling environment**, shares cross-cutting insights into stewarding transformation.

This brief presents insights generated from individual sessions of the ISSD Africa Conference, laying the foundation for developing perspectives and strategies for pursuing the ambition of climate change adaptation. This document refers to and thereby acknowledges the ISSD Africa Conference sessions, ISSD Africa topics and/or other regional initiatives and hosting organization(s) that contributed to the development and formulation of individual insights.

ISSD Africa encourages your further reading of its communiqués, briefs, and other knowledge products, and participation in the Community of Practice.

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ISSD Africa Conference: sessions, insights, ambitions, and perspectives

Concluding the third phase of ISSD Africa, 170 seed professionals met in Kigali from 17 to 19 October 2022 for the ISSD Africa Conference, where they shared and discussed outcomes of the CoP's action research activities. This took place over the course of eight sessions, corresponding with ISSD Africa's eight topics, and was complemented by seven additional sessions on topics proposed by other continental and regional initiatives.

Each of the sessions provided specific insights. A committee comprising participants from diverse backgrounds, expertise, and areas of engagement in the seed sector, prepared a synthesis of emerging insights and perspectives. These have been grouped into five ambitions that provide direction and shape a vision for seed sector transformation in the coming years. These ambitions are food security and nutrition, equity and inclusion, competitiveness, climate change adaptation, and resilience to shocks and stresses. The third ISSD communiqué has been compiled to share these perspectives for advancing seed sector transformation in Africa.

Call for action

ISSD Africa aimed to document the outcomes of the conference in the communiqué and briefs as accessible formats for policymakers, practitioners, and researchers active in and concerned with the transformation of Africa's seed sector. ISSD Africa strives to inspire these readers and encourage their use, exchange, and discussion of the perspectives and insights shared. It is ISSD Africa's hope that the communiqué and briefs support reflection on and guidance of organizations, programmes, and individual professionals in contributing to the transformation of the seed sector with the ultimate goal to improve farmers' access to and use of quality seed of improved varieties.

Ambition

Behaviours, technologies, and systems in the seed sector adapt to future climates that are different, more variable, and/or less predictable than in the past.

PERSPECTIVE 24:
Conserve genetic resources for future

Due to climate change and variability, farmers can no longer rely on crops and varieties that used to perform well in their fields without running the risks of not being able to withstand shocks and ensure food security and nutrition. Varieties that have been locally developed over decades may now disappear from their farms. At the same time, these varieties may still perform well in other locations and have traits that are valuable for further variety development and improvement. To combat genetic erosion and guarantee future use, investment in the conservation of crops and varieties, including landraces and wild relatives of domesticated species, needs to be prioritized. This requires action both internationally and at national and community level.

INSIGHT:
Community seed banks strengthen socio-ecological resilience

Farmers and their communities struggle to maintain crop diversity, particularly of farmers' varieties. Diversity is disappearing or under pressure due to the commercialization of agriculture and the expansion of commercial food and seed supply chains. Farmers' management of crop diversity is also impacted by recurring shocks and stresses. Community seed banks (CSBs) are forms of collective action to withstand and counter crop diversity loss. CSBs contribute to increased seed exchanges; improved access to novel crop diversity; greater saving of traditional varieties; and enhanced access, use and exchange of information and knowledge. These effects strengthen the social-ecological resilience of local communities. CSBs are constrained in their functioning by wider socio-economic trends, including social divisions, outward migration of youth, and a change in livelihood strategies. CSBs are an important community-based institution worthy of public policy and financial support.

INSIGHT:
Digitalization can help scale community seed banks

Recent experiences in Uganda, Kenya, and Zimbabwe with networking CSBs at national and regional levels, creating platforms for interaction and learning, facilitating seed and seed-related information sharing, and supporting CSBs to have a voice in policy and development processes, show the potential for CSBs to reach many more small-scale farmers in Africa. The use of digital tools will help to improve the efficiency of CSB management, strengthen platforms and networks for the conservation and use of local diversity, and provide critical information and support services to community-based seed systems. Digital tools have the power to accelerate the impact of CSB platforms and foster in a more efficient manner the scaling of CSBs to new regions and countries.

PERSPECTIVE 25:
Promote community-based approaches

Strengthening the adaptive and mitigative capacities of farming communities requires collaboration between many stakeholders, including those at community level who best understand their context, challenges, and opportunities. Climate change adaptation and mitigation capacities should be strengthened through community-based approaches that promote farmers' use of resilient crops and varieties and farming practices. Examples include the establishment of community-level stakeholder platforms, community seed banks, participatory variety development and evaluation programmes, and community-based schemes for producing and marketing quality declared seed of adapted and farmer-preferred varieties.

INSIGHT:
Community-based seed stakeholders contribute to the local availability of quality seed and access to new varieties

Community-based seed stakeholders, such as farmer seed enterprises, local seed businesses (LSBs), and CSBs, play an important role in supplying small-scale farmers with quality seed of many locally important food crops, particularly those that are not of interest to commercial seed companies. The critical contributions of community structures to not only seed supply but also to the conservation of diversity and input to crop improvement should be recognized and supported.

PERSPECTIVE 26:
Consider climate change as an important feature informing variety development and seed supply

Climate change leads to fluctuations in climatic conditions such as rainfall and temperature, and variations in cropping seasons and growing cycles. Fresh water depletion and rising salinity and sea levels may seriously affect crop production. In addition, new pests and diseases impact crop production with increasing frequency. The many features of climate change need to become central to variety development programmes. New objectives and technologies for adaptive breeding must be included. Continuous production, promotion, and supply of quality seed of better adapted crops and varieties with traits critical for adapting to new climate conditions are essential to maintain production and productivity and ensure food security.

INSIGHT:
Climate change adaptation requires genetic innovation

Climate change necessitates continued investment in the development of new, improved, and locally adapted varieties. A functional seed sector is critical for bringing the benefits to farmers from global and national investments in public goods, such as genetic innovation. However, the sustainable and continuous flow of new varieties remains significantly hampered by technical, institutional, and systemic constraints in the seed sector. In the context of climate change, seed sector transformation needs to consider the various categories of crops; cater to formal, intermediary, and informal seed systems; and engage partners in the public and private domain, along with community-based stakeholders. Additionally, efforts must be made to enhance diversity, both intra- and inter-specific, deployed by these seed systems, and support breeding of improved varieties of minor crops like cassava, millets, and sorghum, which are climate resilient.

INSIGHT:
Crop improvement needs capacity to unleash local diversity in adapting to climate change

Critical for a seed sector contributing to food security and nutrition within the context of climate change is a broad portfolio of crops for use in variety development programmes and included in the supply of quality seed. This requires focus on crops beyond the major food crops, and consideration of traits relevant for agroecologies affected by climate change, while considering farmers' demands and consumer preferences. Beyond their partnership with CGIAR variety development programmes for the major food crops, national agricultural research systems need capacity and resources for the development and release of a wide portfolio of varieties of local crops.

INSIGHT:
Diagnostics are critical for the management of emerging pests and diseases

Whereas climate change directly impacts crop production through, for example, droughts, floods, salinity, heatwaves, and unpredictable rainfall, it indirectly impacts crop production through the emergence of new plant diseases and pests. Therefore, agricultural research and variety development programmes need to make significant investments in diagnostic capacity for identifying and managing new diseases and pests. Tools must be cost-effective and easy to use in the field.

PERSPECTIVE 27:
Develop more sustainable cropping practices in the face of climate change

African farmers not only face erratic rainfall, higher average temperatures, heat spells, and recurring droughts, but also land and soil degradation. Climate change calls for current farming and production practices to be adapted to more sustainable and nature-positive farming systems. This requires understanding existing mechanisms of adaptation and resilience, but also reducing the impact of agriculture on the environment. In addition to providing access to quality seed of crops and varieties that are adapted to changed conditions, associated sustainable cropping practices need to be promoted, such as soil and water conservation measures, integrated soil fertility management, and integrated pest and disease management.

INSIGHT:
Nature-positive is emerging as an alternative to conventional agriculture

Conventional agriculture contributes significantly to several global crises: a nutrition crisis, a climate crisis, land degradation, deforestation, and loss of biodiversity. Agricultural production systems need to be transformed to become more sustainable. Nature-positive agriculture is an emerging alternative to what has become conventional. Promoting ecosystem services, regenerative practices, agroforestry, circular economy, and waste management all contribute to nature-positive agriculture. Production systems move from monocropping and uniformity, to more complex and diverse systems. This requires investment in research and development for new farming practices, with new crops, varieties, varietal traits, and seed systems, as well as an enabling environment with policies and institutional support for fostering and advancing the transition to nature-positive agriculture and associated seed systems.

INSIGHT:
Nature-positive agriculture requires more diversity to be deployed by seed systems

Nature-positive agriculture uses more diversity for resilience, mitigation, and improved nutrition. Farmers, consequently, will need quality seed and planting materials of new species, including crops, trees, and forages. The shift to nature-positive production systems requires investment in crop improvement, adapting major crops to new management practices, including crop rotation and intercropping, but also the inclusion of local crops and new varietal traits. Functional seed systems need to deliver this diversity of crops and varieties to farmers. By increasing diversity in production systems, nature-positive agriculture is expected to have a beneficial impact on the environmental sustainability of those production systems, enhance food security, and contribute to healthier diets.

PERSPECTIVE 28:
Disseminate information on climate and markets to farmers and other seed sector stakeholders

Access to climate and market information is a prerequisite for foresight planning and for stakeholders including seed users to make informed choices on which varieties to multiply, supply, and purchase. Innovations in climate and seed demand forecasting are required. Innovations need to reach farming communities with information on climate, markets, and varietal traits, which is easily applicable.

INSIGHT:
Major investments are required in both forecasts and foresight for adapting to climate change

Forecasts and foresight are critical tools in the context of climate change adaptation. Forecasts use data from the past to project a linear path towards future demands for crops, varieties, and traits. Foresight tries to understand a range of issues, signals, and trends, and explores different possibilities or scenarios and implications on the demands for crops, varieties, and traits, rather than predicting numbers.

INSIGHT:
Access to and use of data from climate forecasts and foresight is of key importance

Small-scale farmers are most vulnerable to climate change and need access to information to make informed choices on which crops and varieties to plant and what seed to use/purchase. By combining socio-economic data of seed user groups and environmental data, climate information should guide and support the production and dissemination of quality seed of adapted varieties of diverse crops, ensuring that farming communities most vulnerable to climate change gain access to those seeds. Furthermore, climate forecasting in the medium- and long-term is also extremely important for informing breeding and variety development. There are barriers to the use of available data that need to be overcome. If data are available, then awareness raising, capacity strengthening, and more attention to user experience are needed to effect the change required for adaptation.

PERSPECTIVE 29:
Design policies conducive to climate change adaptation of agri-food systems

To promote the implementation of climate-smart farming practices, including the use of adapted crops and varieties, and more resilient production practices adapted to climate change, clear policies and institutional support are required. These policies need to support farmers and other stakeholders who apply such sustainable practices, protect the environment, and meet climate goals. Policies should promote access to and use of agrobiodiversity. They also need to transform farming and market systems so that they are conducive to and rewarding of sustainable practices. In this context, regional and global dimensions must be considered.

INSIGHT:
Crop diversity is crucial for nutrition and climate change adaptation

Crop diversity choices, preferences, and selections are driven by the diverse needs and specific conditions of farming households. These relate to food, nutrition, income, livestock, soil, local climate, and production environment. In the context of coping with hardship, crop diversity choices may include considerations of strategic local food crops. Informal seed systems play a dominant role in addressing the multiple goals of farmers contributing to resilience building. Seed policy should broaden its scope by supporting the functioning of informal seed systems where the roles of women, local markets, traders, and seed social networks are key to crop diversity management and seed supply

INSIGHT:
Community seed banks conserve plant genetic resources in situ and maintain diversity

CSBs are important platforms in the conservation of genetic resources in situ, and in maintaining genetic diversity that can be accessed by farmers as well as breeders, as input to their crop improvement programmes. Women play a key role as custodians and managers in many CSBs. However, CSBs face many technical, economic, institutional, and policy/legal challenges to effective scaling and institutionalization. CSBs should be recognized for their contribution and embedded within national seed programmes and strategies.

INSIGHT:
The transition to sustainable agricultural production must be gradual

Food security and nutrition must be maintained whilst making the transition to sustainable agricultural production. Government support for unsustainable agricultural practices must be halted as soon as possible, but without risking food insecurity or pushing people into poverty.
The monitored introduction and success of market- and non-market incentives for sustainable agricultural practices will support the managed transition to a more sustainable future.

ISSD Africa conference session references:

The insights presented above emerged during specific sessions of the ISSD Africa Conference, organized by partners in the ISSD Africa CoP and global and regional initiatives. These sessions included:

- **ISSD Africa Topic:** Agrobiodiversity, seed, and climate change (the Alliance of Bioversity International and CIAT)
- **ISSD Africa Topic:** Enhancing seed quality assurance (CIP/CGIAR Research Program on Roots, Tubers and Bananas)
- **ISSD Africa Topic:** Creating demand for quality seed (Wageningen University & Research)
- **Initiative:** Transforming seed systems to support nature positive agriculture (the Alliance of Bioversity International and CIAT)
- **Initiative:** Delivering genetic gains in farmers' fields: Genetic innovation in the One CGIAR (CGIAR)
- **Initiative:** Community-based seed production and marketing: Experiences and perspectives (Oxfam-Novib)

Colophon

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