

International Conference on Integrated Seed Sector Development: From scientific understanding to strengthened practice and policy

October 2025, Wageningen, The Netherlands

Call to Action

Introduction

The International Conference on Integrated Seed Sector Development (ISSD), held on 14–15 October 2025 at Wageningen University & Research (WUR), built on over 15 years of experience using the ISSD approach ([Louwaars and De Boef, 2012](#); [De Boef et al., 2025](#)). This approach recognises and connects multiple seed systems, from farmer- and community-managed to commercial, linking them to the broader context of transforming food systems in more desirable directions. During the past two decades, the approach has helped to shape agricultural development programmes, organisational practices, and public policies across a diverse set of countries in Africa, Asia, and Latin America. Rooted in principles of pluralism, systems thinking, and integration, the ISSD approach has been built around a commitment to continuous learning and sharing, anchored by the [ISSD Africa Community of Practice](#) (CoP), national seed programmes implemented by WUR and partners, and collaborations with CGIAR centres.

Since its conceptualisation, the African Union (AU), through the African Seed and Biotechnology Programme (ASBP), has embraced the approach, as articulated in the first ISSD Communiqué published in 2011 ([link](#)). The current conference particularly built on a previous convening organized by ISSD Africa in 2022, where insights from learning trajectories in that CoP as well as associated organisations and programmes informed a set of perspectives guiding seed-sector transformation across the continent; which were documented in the third ISSD Communiqué ([link](#)). This document served as foundation for ISSD Africa's current CoP that focuses on the interface between humanitarian, development and peace-building (HDP) nexus and seed systems.

Built through years of collaboration and mutual learning, a community of engaged practitioners, policy makers and researchers has developed that reflects both the strength and the diversity of the ISSD approach. The approach can be seen as a product of this community's deep and enduring commitment to analysis, evidence, and action. Over time, it has evolved into a shared framework supported by a set of guiding principles (Box 1) that guides seed-systems research, policy, and development.

Box 1 ISSD principles (revised and updated version)

1. Foster pluralism in practice, programs and policies
2. Work according to the structure of seed value chains
3. Value and facilitate interactions between multiple seed systems
4. Recognize the relevance of and strengthen farmer-managed seed systems
5. Promote entrepreneurship and demand orientation
6. Recognize complementary roles of public and private stakeholders
7. Support an enabling and evolving environment for a dynamic sector
8. Strengthen performance in both domains of seed markets and seed sector governance
9. Promote evidence-based seed sector innovation
10. Be intentional about the transformation of the seed sector for more desirable outcomes for society, economy, and environment

Source: De Boef et al., 2025 ([link](#)).

This ISSD Conference was closely linked to the [Special Issue on Integrated Seed Sector Development in the journal Agricultural Systems](#), which is an inter- and trans-disciplinary collection of almost 40 scientific papers authored by a diverse group of seed

systems researchers *and* practitioners. The Special Issue provides a rich evidence base and diverse analytical perspectives on seed systems, the ISSD approach, and topics ranging from theories of change and research methods for seed sector analysis, to seed system archetypes, crop reproductive biology, adoption and scaling, and seed policy and regulation. Moving from research findings toward strengthened practice and policy, the ISSD Conference served as a platform to synthesise and extend the insights emerging from the collection of papers.

The ISSD Conference brought together a community of more than 100 professionals from around the world, including seed-systems researchers and practitioners, complemented by participants from the private sector, civil society, and relevant policy institutions. The interactive nature of the event created opportunities for thoughtful exchanges and deep reflections on the science and practice of seed sector development. It generated new and fresh insights across diverse seed systems, crops, and regional contexts, reaffirming the importance of the principles of the ISSD approach, being pluralism, systems thinking, and integration, for transforming both seed and food systems. The community invested considerable time and effort in shaping these discussions, capturing emerging insights, and synthesizing the event's findings as a precursor to this Call to Action.

Together, the scientific contributions documented in the Agricultural Systems Special Issue and shared during extensive dialogues held during the ISSD Conference form the foundation of this Call to Action. It highlights six perspectives (Box 2) that the community believes should underpin the framing and development of research, policy, and seed-sector development programmes aimed at fostering inclusive, resilient, and innovative seed systems worldwide.

Moreover, the Call to Action emphasises that funding agencies, development partners, and national policymakers and regulators should be more deliberate in enabling seed sector development programmes, seed sector policies, and regulations that genuinely align with and operationalise these six perspectives. They should avoid reverting to narrow or prescriptive policy framings and programme formats and paradigms such as formal or informal seed systems. Such framings constrain seed-system initiatives and limit the transformative potential of seed-sector development.

Shared Perspectives

1. Framing, values, and language

The community participating in the conference reaffirmed that the ISSD approach is not merely a framework for analysing seed systems, but a values-driven approach that is anchored in the inclusive language of pluralism, purposeful evidence and innovation, entrepreneurial engagement, and diverse forms of partnerships that aim to enhance access, availability, and affordability of quality seed and the traits they embody for a diversity of farmers. There was broad agreement within the community that the values of diverse stakeholders matter.

However, the community also recognized that the ISSD approach needs to continuously engage with different people and perspectives that are not fully represented in its circles, in the Special Issue, the ISSD conference, or the community's membership. For example, while voices on ethnobotany and culture, food and seed sovereignty, or (agro-)biodiversity and nature may be present in the community, their views are not always sufficiently articulated in the community's narratives. Moreover, the community acknowledged that it is not only the narratives that require reflection and diversification. In practice, interventions inspired by the ISSD approach have often followed predominantly neoliberal or market-driven logics. Such logics can limit the space for seed-system models driven, for example, by farmers' autonomy and sovereignty in the use of seed, varieties and agrobiodiversity, as well as models that strengthen socially and culturally driven seed networks. This underscores the need to broaden both the conceptual framing and the practical implementation of ISSD so that a wider diversity of worldviews, values, and approaches is meaningfully recognised and integrated. For this reason, the community emphasised the fundamental importance of language use, recognising that the words chosen to describe seed systems largely

Box 2: Six shared perspectives

1. **Framing, values, and language:** Use inclusive, diverse framings that shape credible solutions and avoid narrow, solely market-led narratives.
2. **Evidence, purpose, and transformation:** Ensure evidence drives purposeful change and informs decisions that enhance equity and resilience.
3. **Farmers and entrepreneurship:** Recognise farmers' diversity and agency, strengthening their choices and local entrepreneurial ecosystems.
4. **Learning, scaling, and context:** Scale through iterative learning and context-specific adaptation, not one-size-fits-all replication.
5. **Regulation, trust, and enabling environments:** Develop fit-for-purpose regulations that foster trust, inclusion, and innovation across diverse seed systems.
6. **Partnerships and broader linkages:** Build equitable, long-term partnerships that connect diverse actors and enable shared learning and action.

determine how narratives are shaped, how issues are framed, and which solutions are viewed as credible, legitimate or relevant. The community also highlighted the need to promote ISSD experiences and values across different languages, ensuring that the principles of pluralism and inclusive seed sector development resonate more widely and are accessible to diverse stakeholders.

The community therefore calls for **continuous reflection on these narratives and framings**, and especially **on the core values shaping seed-systems research**. It urges greater attention to the origins, nature, and limits of our knowledge, and how these influence the values that guide research, policy, and practice. This includes knowledge on equity, inclusivity, and diversity; innovation, competition, and collaboration; and the choices and opportunities afforded to heterogeneous farmer populations and other seed sector actors around the world.

For example, a common framing in seed sector development revolves around the adoption puzzle, which describes persistently low uptake rates of new varieties. This puzzle is compounded by the complexity of seed systems involved in deploying those varieties, which are often developed in public breeding programmes. In a similar manner, humanitarian and development agencies operating in contexts of conflict and crisis often frame seed aid around the volume of seed delivered and the number of households reached. They too often overlook the puzzle of seed quality, crop suitability, and the types of varieties demanded by farmers, and they rarely consider how the diverse seed systems from which farmers actually source seed function, even in times of conflict and crises. Yet few governments or their development partners and far too few researchers recognize that such puzzles are often determined by deeply personal decision-making processes by farmers that are conditioned by systemic and institutional factors and shaped by forces that play out over decades, not seasons. There is no silver bullet, no popularisation campaign, subsidy package, or smartphone app that will magically accelerate varietal adoption or deployment. Likewise, no seed aid intervention on its own will strengthen the resilience of farmers and their seed systems in times of crisis and conflict. Lasting progress requires broader, more holistic efforts to build and strengthen seed systems that genuinely serve and support farmers, who are *not resistant to change or backward*, a stereotype that is both untrue and unfair.

Seed is only one element that farmers must consider when making decisions under conditions of uncertainty, with insufficient information, and in the presence of influential social and cultural norms. A farmer's seed choices may be shaped by a litany of factors: prior experience, social learning, rules of thumb, gendered roles in the farm and household, tastes and preferences, rainfall expectations, input costs, soil quality, the availability of family and hired labour, markets and price signals, local politics, and other factors yet to be unpacked.

2. Evidence, purpose, and transformation

The community recognized that collecting and analysing data is not enough. When working on seed systems at the interface of research, policy, and practice, evidence must serve a clear purpose: **to drive change and transformation**. Evidence should provide insights into solutions that demonstrate how access to and use of quality seed and well-adapted varieties lead to social, economic, or environmental benefits, who realizes those benefits (and who does not), and how. This focus on change and transformation shifts the focus from understanding seed as a technology toward understanding seed in the context of pluralistic systems that integrate diverse realities, including incumbent power structures, inertia, and many other elements.

The ISSD approach draws on diverse forms of evidence, varying from farmer surveys, value chain studies, policy analyses, to institutional reviews, but its impact depends on how findings are communicated and used. **Research must be explicitly connected to decision-making**, informing breeding priorities, programme design, regulatory reform, humanitarian and development interventions, and public and private investment strategies. Evidence should strengthen practice, shape institutions, and influence policies that reward inclusivity, resilience, and innovation.

For example, studies analysing varietal adoption by gender, farm size, or market access can reveal deep-rooted inequalities in how farmers benefit from innovation. When combined with value chain mapping and policy analysis, such evidence can illustrate how seed availability, pricing, and seed system innovations might favour larger, better-connected producers over smallholder farmers. Feeding these insights into the design of national breeding strategies, seed quality regulations, or seed sector programmes can shift the focus from aggregate production targets to targets that prioritize equitable access and farmer agency. Evidence then becomes a tool for accountability and dialogue, enabling policymakers, regulators, researchers and entrepreneurs to co-create interventions that make seed systems not only more efficient, but also fairer in how benefits

are distributed and more resilient to economic, environmental and social shocks. In doing so, seed systems can contribute to addressing wider social challenges by improving livelihoods, reducing vulnerability and expanding opportunities for farmers and communities..

The community therefore calls for greater investment in translating research into useful evidence. This means creating value propositions to incumbent structures based on a good understanding of their pains and gains, carefully considered frames of potential costs and benefits, and a keen focus on the underlying values-driven approach. That is not to say that seed systems research must be written and revised for every single target audience. Rather, the research should be explicit about what audience or audiences it connects to, and it should be accessible to diverse forums and advocacy coalitions.

3. Farmers and entrepreneurship

The ISSD approach places farmers at the centre of seed sector development by recognising their diversity in resources and assets, knowledge and capabilities, gender and identity, community and market participation, and aspirations and needs. Farmers are not passive recipients of technology but the central active agents shaping seed systems' outcomes. Yet the discussion also highlighted the need to operationalise this acknowledgement in concrete ways, including through programme design, the framing of indicators, and the definition of targeted outcomes—areas where current practice does not always reflect this commitment.

The community therefore calls for greater acknowledgement of farmers as having both the right and capacity to make informed choices within and across seed systems. For research, policy, and practice, this highlights the need to engage with diversity at multiple scales connecting to broad networks of stakeholders that support or constrain farmer agency in order to advance innovations and solutions for seed sector development. These stakeholders include micro- and small-scale seed entrepreneurs, local aggregators, traders, farmer- and community-based organisations, and other value-chain actors who form the connective tissue between farmers and markets. When ISSD principles (Box 1) are understood and applied, these localised, trust-based relationships can complement the contributions made by commercial seed companies, agro-processors, commodity wholesalers and retailers, as well as those made by public research organisations, extension services, and regulatory agencies. **Building partnerships with local actors** requires investment in social capital, trust, and inclusive business ecosystems.

For example, local seed entrepreneurs, traders, and farmer organizations often respond to the needs of specific communities, producing or sourcing seed and varieties that fit local agro-ecological and market niches. Their success depends not only on technical capacity or finance, but also on predictable market demand, fair regulations, and effective collaboration with extension services, research organisations, non-governmental organisations, humanitarian and development organisations. As such, local seed entrepreneurs are critical contributors for making varieties available from public breeding that are critical to food security, nutrition, and climate-resilience. By recognising and strengthening the interdependencies and relevance of stakeholders at multiple levels, the ISSD approach supports new forms of entrepreneurship that link farmers' innovation to broader objectives of sector transformation grounded in trust, equity, and shared value creation.

4. Learning, scaling, and context

The ISSD approach emphasises that effective scaling requires iterative and dynamic learning across contexts, enabling lessons to be interpreted, questioned, and reshaped through local experience. This demands long-term engagement, flexibility in programme design, and institutional space for experimentation and feedback. There was broad agreement within the community that iterative and dynamic learning matters. Yet these conditions are often constrained by short cycles and accountability pressures of project-based development initiatives, making intentional learning and adaptation difficult. Seed sector programmes and policies often focus on short-term quantitative targets such as the number of new varieties released, tons of certified seed produced, agro-dealers and farmers reached.

The community therefore cautions against scaling particular approaches to seed sector development without grounding them in learning and contextual understanding. This also applies to interventions in the HDP nexus. Too often, seed sector programmes, seed aid interventions, and even policies replicate models that succeeded elsewhere, sometimes under very different agroecological or institutional conditions without fully anticipating the wide range of social, economic, and environmental outcomes that may follow. **Scaling must therefore not be seen simply as replication, but as adaptation, accompanied by a continuous process of testing, reflection, and adjustment.**

For example, a public-private partnership (PPP) model for hybrid maize or commercial vegetables that successfully develops seed markets in one country may not function in another where market maturity, crop diversity, consumer preferences, or governance landscapes differ. Similar challenges arise when applying models designed for hybrid maize or commercial vegetables to crops with lower commercial returns, different reproductive biologies, or a stronger public role in breeding and delivery (e.g. other cereals, legumes, oilcrops, root- and tuber crops, and forages). Comparative learning across crops, geographies, and institutional settings can reveal why certain arrangements thrive while others falter. When such insights inform the design of seed sector interventions, including PPP models, they shift the focus from scaling what worked to understanding why it worked, including how and why farmers and other stakeholders choose to adopt, adapt, or reject certain varieties, technologies, or business models under specific conditions.

5. Regulation, trust, and enabling environments

Public policies, regulations, guidelines, and rules can both enable and hinder the functioning of the multiple seed systems that make up a seed sector. Often, seed policy regimes do not take the diversity and complexity of seed systems into account, striving instead for simplicity and standardization. The ISSD approach recognizes that there is no one-size-fits-all strategy, and instead promotes plurality in policy and regulation.

Yet in many low- and middle-income countries, seed policy regimes are modelled on more mature industries such as those in Europe. This may not be appropriate especially where regulatory agencies are poorly resourced, where regulators' own technical and functional capabilities are limited, or where the private sector and civil society are not sufficiently organized to shape regulations in a manner that matches seed stakeholders' interests. Striking the right balance is difficult but essential, as is the intended purpose of regulation. Seed regulations are not an end in themselves, and seed-system practitioners and researchers should monitor their effects on the desired outcomes of stricter or looser market control. Sensible regulation should facilitate improved access to diverse, affordable, quality, and healthy seed. If regulations instead limit varietal portfolios or increase compliance costs, while weak or inconsistent in its enforcement, they can undermine confidence in seed markets and quality assurance systems, and reduce investment in breeding, seed production, and marketing. Effective governance must therefore go beyond control: it should embrace diversity and dynamism among seed systems and cultivate trust, transparency, and accountability among the diverse stakeholders that produce, market, regulate, and use seed.

Therefore the community calls for more effort to be made towards guiding **truly enabling policy environments** that support accountability, inclusivity, and innovation. This requires regulatory solutions that are fit for purpose and that accommodate diversity in crops, seed-system dynamics, reproductive biology, business models, markets, and agroecological conditions. It also requires recognising and accommodating the diversity among farmers themselves. Such flexibility may take the form of simplified registration procedures for farmers' and improved varieties; adaptive intellectual property systems that recognise both breeders' and farmers' rights, and in some cases incorporate access and benefit sharing; quality assurance systems that accommodate multiple seed systems, specific crop requirements, and market dynamics; harmonised trade frameworks aligned with diverse seed sector realities; and adaptive, i.e., seed-system-conscious, procurement and distribution frameworks within seed aid and other seed interventions in areas of conflict and crisis.

For example, in some countries, subsidies for seed enterprises or farmers are available only for officially registered and certified varieties. While this may strengthen formal control, it can also exclude local seed entrepreneurs and producers and locally adapted varieties that meet farmers' preferences. In turn, these rules can discourage innovation and narrow the diversity of varieties available in markets. Conversely, when regulations are adapted such as introducing differentiated quality assurance or flexible varietal release pathways, they can open opportunities for local entrepreneurship, cross-sector partnerships, and farmer participation. Such enabling environments build trust and responsiveness: they make formal systems more accessible and meaningful to farmers and help regulators better understand why some stakeholders operate outside them. In this way, regulation becomes not only a tool of control but a driver of inclusion, trust, and adaptation across coexisting seed systems.

6. Partnerships and broader linkages

The community recognised that the future of seed sector development depends on stronger, more meaningful partnerships within and across the boundaries of research, practice, and policy, and the public, private, and civil spheres. The complexity of today's seed systems demands collaboration among farmers, private sector, civil society organisations, government

agencies, regulators, extension services, and seed system researchers. No single discipline, institution, or actor can address the challenges of seed security, market development, or climate adaptation alone.

Within the ISSD approach, **inter- and transdisciplinary collaboration**, where scientific and practical knowledge are jointly generated, tested, and applied, provides a foundation for transforming seed systems towards greater innovativeness, inclusivity, and resilience. Such partnerships are built not only on shared objectives but on mutual respect, trust, and long-term engagement. They require openness to different ways of knowing, valuing, and applying knowledge, and mechanisms that enable joint experimentation, reflection, and learning. The community therefore cautions against partnership models that are instrumental or transactional, and instead calls for approaches that genuinely share power, foster mutual accountability, and strengthen collaborative learning across all actors.

For example, partnerships that link farmer cooperatives, local seed companies, and extension services with researchers and regulators can accelerate varietal diffusion, strengthen entrepreneurship, and improve the reach and trustworthiness of quality seed. This applies both to improved varieties developed by public breeding programmes or to local varieties sourced from other regions for crops critical to food security and nutrition. These are complemented by collaboration with medium and large private companies that can expand market access primarily for hybrid varieties of crops with strong commercial potential. When embedded in inclusive PPPs or multi-stakeholder platforms, such diverse partnerships foster complementarity, shared accountability, and continuous learning, and also foster more dynamic and adaptive regulatory frameworks supporting seed systems' functioning. In this way, these inter- and transdisciplinary partnerships become engines of innovation and transformation, enabling pluralistic seed systems to adapt and respond to the evolving needs of farmers, markets, and societies.

African perspective

Across Africa, the perspectives outlined in this Call to Action align closely with the continental ambitions expressed through AU's African Seed and Biotechnology Partnership Platform (ASB-PP) and the harmonisation efforts of the Regional Economic Communities. These frameworks position seed-sector development as a cornerstone of food security and nutrition, regional integration, and agricultural transformation. This AU-endorsed coordination mechanism and policy think tank is the strategic continental space where the insights of this Call to Action can inform policy dialogue, monitoring, including the Comprehensive Africa Agriculture Development Programme (CAADP) Biennial Review Seed Index and joint action toward strengthening seed systems.

Continental commitments, however, achieve impact only when they are translated into context-appropriate implementation that reflects Africa's diversity in crops, agroecologies, market conditions, and multiple seed systems. The ISSD approach provides a practical foundation for connecting these ambitions to grounded practice, linking harmonisation efforts with farmers' realities, inclusive entrepreneurship, adaptive regulatory environments, and evidence-based learning. By encouraging stronger alignment between continental frameworks, regional initiatives, and national seed strategies, the Call to Action supports countries in operationalising their commitments through approaches that are equitable, resilient, and responsive to farmer needs. In doing so, it reinforces a continental vision in which pluralistic, innovative, and trustworthy seed systems drive broader food-system transformation.

Turning perspectives to action

Together, these six perspectives articulate a shared vision for more inclusive, resilient, and innovative seed systems. The community expresses its commitment to consistently bring these perspectives into future development programmes, seed aid interventions, practice, and policy, with research playing a supportive yet critical role in informing, strengthening, and questioning these efforts. Members of the community also welcome opportunities to partner with others—across regions, disciplines, and sectors—who share the ambition of building seed systems that better serve farmers and expand access to and use of quality seed and well-adapted varieties.

Colophon

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Proposed citation

WUR & SeedNL, 2025. Call to Action. International Conference on Integrated Seed Sector Development: From scientific understanding to strengthened practice and policy, October 2025, Wageningen, The Netherlands. Wageningen University & Research, Wageningen, and SeedNL, Utrecht ([link](#)).

