

Learning from agri-food innovation pathways in Brazil, India and Kenya



In three countries of the Global South, **CoSAI-commissioned studies** applied a shared analytical framework to recent cases of innovations that have made a difference for national agri-food systems. The aim was to generate lessons on the factors behind successful innovation pathways, showing the way for investments around the world.

Photo: Gabriel Faria / Embrapa

Actions needed

- **Private investors and innovators should seek opportunities** where they align on the level of outcomes and larger vision, where they can form synergistic partnerships, and where they can tailor context-specific packages.
- **Investors with risk appetite must lead the way for transformative change**, with their willingness to invest in long-term ideas, deploy innovative financing and stay flexible.
- **Public innovators should invest in enhancing social capital and social organizations to facilitate multiplier and spillover effects.** Government support can facilitate innovation in a concerted manner as part of the state agenda, and connect with broader agendas like climate action.
- **All innovators need to understand and address bundles of factors affecting scaling** including technology, policy, finance, institutions and leadership.
- **Public and private actors should review and adapt innovations over time** to meet producer and market needs, and invest in the continuity and quality of extension and advisory services.

Transformation is a journey, and innovation is a pathway

Countries across the Global South are engaged in a search for routes to transformation in agri-food systems: innovations that spur fundamental shifts, for the better, in the way food is grown and supplied. The right innovation pathways can move systems toward sustainable agricultural intensification (SAI), with urgently needed benefits for farming livelihoods, food security, ecosystems and resilience to the impacts of climate change.

CoSAI's series of [country studies](#) on innovation pathways sought out innovations – or bundles of innovations – that have successfully scaled up and created transformative

changes in their countries within the last 20 years. These changes should be reflected in positive impacts on social, economic and/or environmental dimensions. Importantly, in these studies, innovation is not necessarily a novel idea; it can also refer to an old idea that has been applied in a new way. And it includes not only science and technology but also innovations in policies, finance and social institutions.

Case studies were selected that had sufficient availability of data, had reached scale, were financially sustainable and had shown a transformational impact in environmental, social or economic aspects of the food system. Beyond these screening criteria they were also selected for diversity in farms and farmers, innovations, agricultural contexts and systems and their key actors.

TEN RECENT INNOVATION CASES WERE ANALYZED IN THE THREE COUNTRY STUDIES

BRAZIL

Balde Cheio (Full Bucket), a 'participatory technology transfer' project for dairy SAI which expanded progressively to 500 municipalities, tripling productivity.

One Land Two Waters, a program that brought water harvesting and storage technologies to 200,000 households in the semiarid region, with civil society partnering with government.

Integrated production systems that brought together agriculture, livestock and forestry systems simultaneously, in succession and in rotation, expanding to 17.4 million hectares.

Agrosmart irrigation monitoring system, launched by a start-up as a decision support platform, now monitoring 800,000 hectares for a reported 60% reduction in water use.

INDIA

Andhra Pradesh Community Managed Natural Farming, a program enabling distributed innovation and experimentation by farmers who are adopting Natural Farming practices.

Safe Harvest "pesticide-free" products, aimed at the domestic market, with a specialized supply chain of farmer producer organizations involving over 100,000 mostly smallholder farmers.

Trustea, a sustainability standard tailored to and established in the Indian tea industry, now verifying 56% of the country's tea, mainly for domestic markets.

KENYA

Water harvesting and storage in farm ponds, with small-scale farmers excavating an estimated 10,000 ponds to use for crop irrigation.

Solar-powered irrigation in peri-urban Kajiado County, driven by demand for fresh produce in nearby Nairobi and innovative financing models.

Blended finance supporting SAI and watershed management in the Upper Tana basin, with a Water Fund established by a public-private partnership in downstream Nairobi.

National and local leadership drive transformations in Brazil

Brazil is one of the main producers and exporters of food in the world, and plays a similarly huge role in the search for more sustainable ways to produce food. The four cases showed how Brazilian innovations have evolved and been adapted to respond to major social, environmental and economic challenges through systemic and integrative approaches that combine institutional consolidation (particularly around public research corporation Embrapa), extension services and end-user participation. National government leadership and a sense of mission was critical in three of the four cases.

For the integrated production systems and Agrosmart irrigation platform, demand needed to be built, so the technological solutions were the fundamental elements, after which came the partnerships and arrangements for gaining scale. Conversely, demand already existed for Balde Cheio and One Land Two Waters, so their gains in scale emerged from establishing institutional arrangements that ensured expansion and consistent financing. Individual leaders were important for keeping their mission on course. Nevertheless, the technological solutions themselves needed to be constantly modified, complemented and extended.

The lessons learned from these case studies are strongly related to Brazil's institutional context, which is endowed with functional monitoring and control mechanisms. Any transfer of the lessons learned to countries with less institutional maturity and organization will need to be adapted to those countries' circumstances, given the importance of Brazilian institutional arrangements in scaling up innovations for SAI.



Integrated production systems, Brazil. Photo: Gabriel Faria / Embrapa

Distributed innovation and consolidated standards are a strong mix in India

In India, most farming innovations since the Green Revolution have been technology-led ones such as high-yielding seeds and chemical fertilizers. However, these are facing the challenges of accounting for the environment and human development. With limited market and policy incentives, the uptake of sustainable agriculture practices and systems remains low. Nevertheless, the three case studies from India show pathways driving innovation toward SAI at scale.

Andhra Pradesh Natural Farming is a well-known program. The case study highlights the way that this was designed for farmers to become experimenters and innovators, finding solutions suitable to their context and adopting and customizing Natural Farming practices at their own pace. Government support and 'patient' funding have enabled this sustained experimentation.

The core innovation of Safe Harvest is the creation of a new product category for the domestic market – "pesticide-free" food – and establishment of the specialized supply chain it requires. This came out of farmers' demands for product differentiation, and its growth has evidenced how essential it is to design to the demands, needs and priorities of key stakeholders, focusing on long-termism and trust-building. Trustea, meanwhile, is a case of self-regulation by India's tea industry, which has introduced an India-specific sustainability standard for the domestic tea market, focused on issues such as working conditions and food safety. Trustea has been able to scale enormously through multi-stakeholder engagement and capacity building – beyond that seen in most certification efforts – to drive compliance among farmers.



Tea, Nelliampathy, Kerala, India. Photo: Aboodi Vesakaran / Unsplash

Good ideas spread along with innovative finance in Kenya

Kenya's agricultural sector has a broad spectrum of farm sizes, activities, actors and value chains, and it is among the most innovative in sub-Saharan Africa. This is driven by education, an entrepreneurial environment, international trade, a rapidly growing population with declining areas of good land, climatic limitations, and highly competitive markets. As the case studies show, this is a setting where end-user participation and the right financing is a recipe for fast lateral scaling.

In eastern Kenya, farm ponds for water harvesting and storage, originally popularized by a retired teacher, have been widely promoted and adopted as part of establishing irrigation for SAI and climate-resilient food security. On the outskirts of Nairobi, another technological innovation has focused on solar-powered irrigation of fresh produce for the hungry urban market – a strong pull factor – and this has equally hinged on innovative financing for solar kits, including panels, pumps and irrigation gear.

The final innovation case is a program of watershed management in the Upper Tana River Basin, enabled by a blended-finance Water Fund. Through this, the downstream water users in Nairobi contribute and make it possible for upstream communities to develop SAI and watershed conservation.



Earthen farm pond, Yatta, Machakos, Kenya.
Photo: Bancy Mati / Resource Plan Ltd

Conclusions

The case study authors identified strong agreement in the lessons across their three very different countries. Key factors that seemed to lead directly to scale in innovation pathways were:

- Leadership by individuals and institutions with a strong sense of mission
- Partnership and trust – between partners, of funders, and of end users
- Bundling of complementary innovations, e.g., business models and technology
- Consolidation of institutions with understood roles and support from the national government
- Financing – public, private or blended, often innovative in its own right
- Positioning of end users at the center of the innovation, both via engagement and the development of tailored solutions.

There was also general agreement in recommendations for innovators, although some of these were specific to public or private actors. Private actors should:

- Invest where there is alignment on outcomes and a larger vision
- Keep investments flexible and be willing to take on risks with an eye on the long term
- Encourage targeted bundling of solutions.

Public actors should:

- Invest in enhancing social capital and social organizations to facilitate multiplier and spillover effects
- Facilitate scaling through partnerships, funding schemes and/or regulations, making SAI part of the national agenda.

Both should invest in developing context-specific solutions tailored for end users. Even when this is achieved, the resulting innovations should always be reviewed and adapted over time; it is an ongoing process to follow an innovation pathway right to the end.

For more information, see the full report at: <https://wle.cgiar.org/cosai/pathways-for-innovation>