COSTEA
ENSEMBLE, POUR RELEVER LES DÉFIS DE L'AGRICULTURE IRRIGUÉE

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POLICY BRIEF COSTEA – Senegal | 2026

REHABILITATION IS NO LONGER ENOUGH!

Reinventing irrigated systems for a successful agroecological transition in Senegal

THEME
Agroecological re-engineering of collective irrigation systems



THE CENTRAL MESSAGE

The challenge is no longer to rehabilitate ageing infrastructure as it was, nor to replicate conventional irrigation schemes. It is to design irrigated systems that produce better while using fewer resources, while strengthening their resilience, economic viability, inclusiveness and territorial anchoring.

THE 4 ADVOCACY MESSAGES

1. **Finance irrigated systems, not just infrastructure.**
2. **Make water governance an investment in its own right.**
3. **Mainstream the territorial co-design of irrigation projects.**
4. **Adapt investment performance criteria to agroecological re-engineering.**

Authors: Finda Bayo Diakhaté, Marame Ba, Elisa Juszczak, El hadji Malick Sylla, Moussa Sall, Khassim M. Sarr, Sami Bouarfa, Astou Diao Camara

1 Why change the model?

Irrigated systems in the Senegal River valley now face multiple demands: increasing agricultural production, contributing to the country's rice self-sufficiency, improving water and energy efficiency, preserving natural resources and ecosystem services, adapting to climate change, raising farm incomes and sharing benefits more equitably. However, farmers face technical, organisational, institutional and economic constraints that limit their ability to fully perform their roles and to make lasting use of the schemes.

In the large irrigation schemes, farmers are required to commit collectively to a single cropping season, generally dry-season rice. Most schemes remain under-used, or even unused, during the other seasons and suffer from inadequate maintenance.

This situation accelerates the deterioration of infrastructure and causes significant income losses for farmers. These difficulties are compounded by ageing pumping stations, whose insufficient flow rates lengthen irrigation rotations. Heavy losses through seepage and evaporation further reduce irrigation efficiency. Together, these dysfunctions gradually contribute to soil salinisation and land abandonment.

While most of these schemes are currently being rehabilitated, agroecological re-engineering proposes a paradigm shift: going beyond simply restoring structures to undertake a comprehensive transformation of irrigated systems and the territories that host them. This approach links water management, infrastructure, production systems, governance and economic dynamics, placing stakeholders and the preservation of natural resources at the heart of this transformation.



What do we mean by agroecological re-engineering?

« Agroecological re-engineering of irrigated systems is a collective process of jointly reconfiguring infrastructure, governance and practices in order to promote technical and organisational levers that support the agroecological transition. »

2 A participatory approach to build a shared vision

This policy brief draws on the lessons of COSTEA's work on the agroecological re-engineering of irrigated systems in Senegal, in particular the participatory workshop held in Saint-Louis from 2 to 4 June 2026. Bringing together representatives of irrigation development and management agencies (SAGI) and other partner organisations, the workshop aimed to identify and discuss the conditions for reorienting the design, rehabilitation and management of collective irrigated systems towards greater agroecology, climate resilience and food sovereignty.

The approach combined conceptual inputs, experience sharing, group work, the ARIHA serious game and exchanges with local stakeholders (farmers, division head, pumping station manager, union presidents, etc.). This participatory and iterative approach made it possible to compare viewpoints, identify obstacles and levers for transformation, and then draw out strategic messages to inform advocacy and dialogue with decision-makers.

3 Six dimensions to reinvent irrigated systems

Water governance

The efficiency of an irrigated system depends as much on management rules and capacities as on the infrastructure itself. Decision-making mechanisms, the allocation of responsibilities among stakeholders, water-use monitoring, water distribution and maintenance directly determine collective performance. Water governance must therefore be treated as a central component of the agroecological transformation.

The interdependence of infrastructure and its environment

Hydraulic structures are not independent of farming practices, farmers' organisation, land dynamics and the characteristics of the territory. From the design stage, technical choices must integrate objectives of water and energy savings, diversification, soil conservation and climate adaptation.

Farming practices and resource management

The agroecological transition requires bringing water management closer to cropping practices and farm capacities. Improved land levelling, better irrigation control, crop diversification, soil management and reduced use of chemical inputs must be treated as interdependent elements.

Economic viability and value chains

A technical transformation cannot be sustainable if it weakens farm economies. Investments must better link production, processing, marketing and market access. Cost control and better valorisation of produce from resource-efficient practices are decisive levers to encourage farmers to embrace the transition and remain committed over time.

Inclusion and territorial anchoring

Women and young people must be able to access productive resources, economic opportunities and decision-making spaces. More broadly, re-engineering must be designed at the territorial scale, involving farmers' organisations, scheme managers, local authorities, technical services, researchers and economic actors.

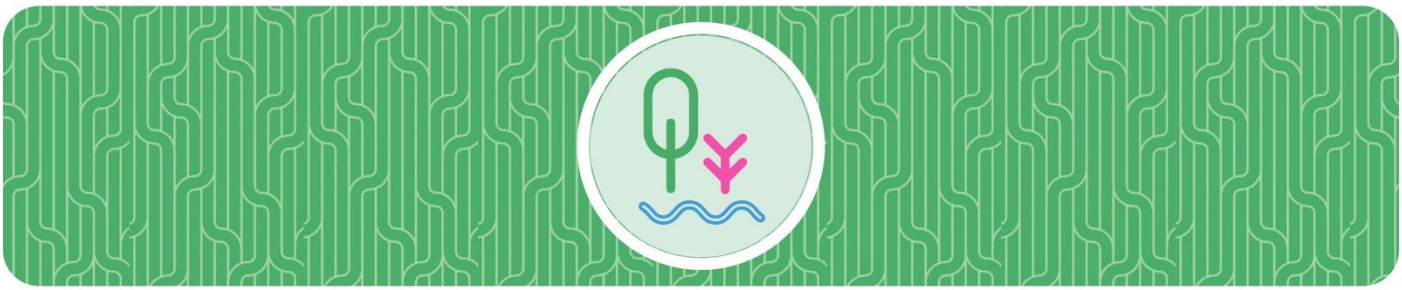
Support and technical advisory services

Support and technical advisory services must go beyond training to foster the experimentation, adoption and long-term uptake of agroecological practices. They should rely on local advisory services, demonstrations through farmer field schools and collective learning.

Building the capacities of farmers and technical advisers is a key lever of this collective and systemic transformation. It must be combined with accessible financing mechanisms, adapted to agricultural cycles and risks, to facilitate access to credit and support the investments needed for the transition.

These interventions should be part of a continuous process combining training, experimentation, demonstration, support and adjustment of practices, as well as the capitalisation and dissemination of agroecological innovations.

These six dimensions are the main levers of an agroecological re-engineering of irrigated systems. They now call for a change in investment choices and in the way public action is conducted.



4 Four advocacy messages to reorient public action

COSTEA's findings lead to four advocacy messages concerning the design, financing, governance and evaluation of irrigation projects.

ADVOCACY 1 Finance irrigated systems, not just infrastructure

Public investment must cover all the dimensions needed for irrigated systems to function sustainably, beyond the construction or rehabilitation of hydraulic structures. From the project design stage, funding must incorporate agroecological practices, sound water management, infrastructure maintenance, the strengthening of farmers' organisations and the economic viability of value chains.

ADVOCACY 2 Make water governance an investment in its own right

Within collective irrigation schemes, the pooling of core infrastructure (pumping stations, irrigation and drainage networks) must go hand in hand with a clear definition of each farmer's rights and responsibilities. Reliable and equitable access to water must be coupled with transparent coverage of the hydraulic costs attached to each plot. Funding coordination, water allocation and fee management arrangements is essential to improve irrigation efficiency, encourage cropping over several seasons and strengthen farmers' autonomy.

ADVOCACY 3 Territorialise irrigation projects

Projects must be co-developed with local stakeholders. Farmers, farmers' organisations, scheme managers, local authorities, technical services, researchers and economic actors must take part in every stage, from diagnosis to evaluation. Co-design makes it possible to adapt technical solutions to the social, economic, environmental and institutional realities of each territory.

ADVOCACY 4 Adapt investment performance criteria to agroecological re-engineering

Investment evaluation must go beyond the sole criteria of infrastructure functionality and developed area to assess the overall performance of irrigated systems. It must include water and energy efficiency, climate resilience, economic and social viability, resource conservation, the inclusion of women and young people, and local governance capacity.

FROM DIAGNOSIS TO PUBLIC ACTION — The challenge now is to translate these orientations into concrete requirements in funding mechanisms, feasibility studies, terms of reference, support arrangements and monitoring and evaluation systems for irrigation projects. Agroecological re-engineering must guide choices from the design stage and throughout implementation, so that the transition becomes durably embedded in public decisions and management practices.

5 The cost of inaction

An intervention limited to rehabilitating infrastructure risks reproducing the same weaknesses of irrigated systems: high operating costs, equipment deterioration, inefficient water management, low uptake of innovations, vulnerability to climate hazards, biodiversity loss and economic difficulties for farms. Over time, these weaknesses can lead to the abandonment of irrigation schemes and jeopardise the expected benefits of public investment.

Conversely, a systemic approach makes it possible to act on these factors jointly in order to improve resource-use efficiency and territorial resilience, consolidate the economic viability of farms and ensure the sustainability of public investment.

6 Conclusion: towards a systemic vision of irrigation territories

Agroecological re-engineering calls for rethinking agricultural investment by viewing each irrigation scheme as a socio-ecological system rooted in a territory. Its sustainability depends on the interactions between natural resources, infrastructure, farms, organisations, markets and institutions.

The agroecological transition of irrigated systems therefore goes beyond changing practices in the field. It requires jointly transforming infrastructure design, water governance, rules of access to resources and economic models, in connection with markets and territorial dynamics. Future investments must support this transformation as a whole, consistently and over the long term.

Learn more: comite-costea.fr/en/our-focus-areas/agroecological-re-engineering-of-collective-irrigated-systems

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