

Irrigated agriculture: A service-based approach to put irrigators at the center of policy formulation

Lessons from a comparative analysis of services to farmers in Tunisia and Cambodia

Problem statement

Irrigated agriculture^[1] can help address challenges of food security and sovereignty, develop regions and farms, improve trade balance, and contribute to climate change adaptation.

An irrigated area is a complex system in which the social, cultural, technical, economic, and environmental aspects of agriculture all play a part. Such complexity, however, is often disregarded by irrigation projects and policies, as they tend to approach irrigation from a restrictive perspective that focuses solely on hydro-agricultural development or the value chain. This makes it difficult for irrigation to fulfill its promises.

There is a more systemic and holistic approach, which is to address irrigation from the angle of services to irrigators. Putting the focus back on irrigators themselves, this alternative enables better coordination of the micro, meso, and macro levers of development.

The comparative analysis of two countries presented here picks out problems in conventional approaches to irrigation projects, “blind spots” that hinder the achievement of production targets assigned to irrigated systems.

Box 1 – Definition of services for irrigators

Services for irrigators comprise the delivery of all the service operations farmers may require. These operations may be technical (water, inputs supply, marketing, credit and insurance, labor and mechanization, land security, etc.) or intellectual (advice, training, information, representation, certification, etc.). They may be provided by the public sector, the private commercial sector, or the agricultural profession.

[1] Any form of water management for agricultural production purposes. Since its probable appearance in Mesopotamia (5,000 BC), it now covers a great diversity of irrigated systems. It produces 40 % of the world's food on less than 20 % of cultivated land.

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Approach

A comparative study of services to irrigators was carried out on two very different irrigated systems. The first, the Hézoua 1 oasis in Tunisia, is a system of the modern collective type, established in 1962 and rehabilitated in 2018, covering an area of 72 hectares with 94 farms as of 2022, primarily producing date crops. The second, the rice area of Stung Chinit in Cambodia, was created in 1977, underwent rehabilitation from 2006 to 2008, and covers an area of about 2,800 hectares, shared by 2,850 owners in 2022.

The same methodology was applied at both sites. It consisted in carrying out a value chain-territory diagnosis, a typology of farms, an analysis of their service requirements, a mapping of existing services providers, and an evaluation of these services in relation to the needs of irrigators. The methodology was adjusted according to local needs: a more detailed value chain analysis was conducted in Hézoua 1 (as value chain issues were deemed crucial there), and a historical service deployment analysis was conducted in Stung Chinit (illustrating the link between services and how well the irrigated area performed). An operational diagram on how to develop the existing services was then drawn up for each site. Each operational diagram presents a theory of change for the development of services

and outlines operational modalities (role sharing, funding mechanisms, and roadmap). This research, a COSTEA initiative, was conducted by the Iram – Arte-Fact – Biche consortium in conjunction with national ministries.

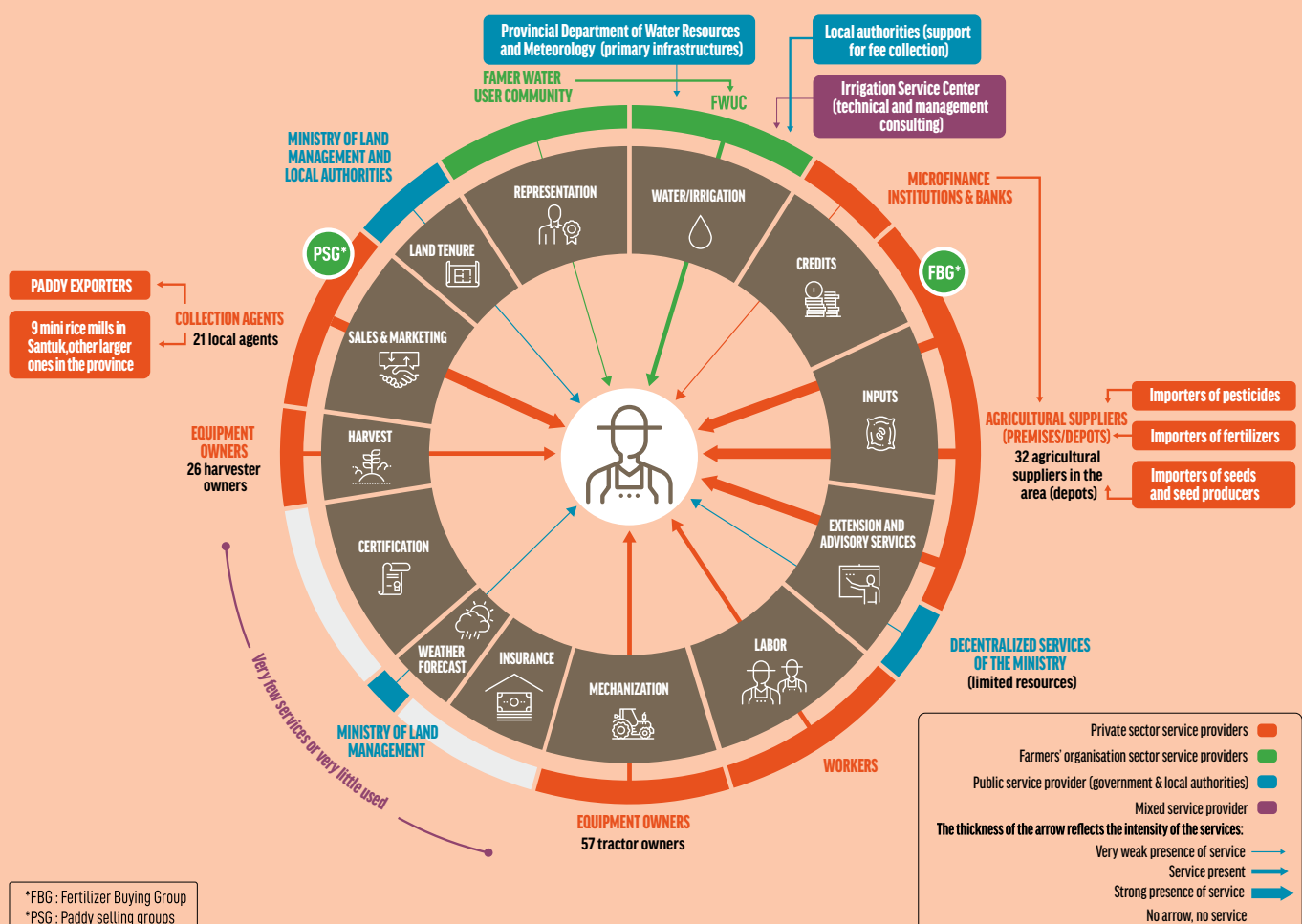
Results

The Stung Chinit site in Cambodia illustrates a situation in which a comprehensive set of services has been established gradually (Diagram 1), starting with water service and land tenure security during the irrigated area's rehabilitation phase (2006–2008); followed by marketing and supply services (from 2015); extension and advisory services (by input suppliers or from farmers to farmers) for the introduction of dry season rice; and, ultimately, mechanization services. As a result, irrigators transitioned from single to double, and, in some cases, even triple annual rice cropping. The availability of water alone was not enough to trigger this process of intensification: it only gained momentum with the structuring of the rice market, the progress of mechanization, and increase of inputs supply. The decline in non-agricultural activities (such as wood cutting during the dry season) also contributed to this intensification. The service needs of irrigators are now being met, aided by the fact that the competitive market makes service providers

Diagram 1: Irrigators as key actors in a service offer (existing or to be built—here, the case of Stung Chinit, Cambodia)

The service rosette tool can be downloaded from the COSTEA website

<https://www.comite-costea.fr/production/loutil-la-rosace-des-services-aux-irrigants>



fairly competitive, so that the services offer enables the area to fulfill its promises in the short term. Nevertheless, it appears that this intensive production model does have limits, both for farms (due to the rise in production costs and soil degradation) and for health and the environment, due to the increasing use of fertilizers and phytosanitary products. Furthermore, the sustainability of the irrigation service is jeopardized by recurring organizational challenges. The operational diagram of services proposes to restore the viability of the operation and maintenance system and to promote the adoption of agroecological practices that are more sustainable and profitable.

By contrast, the Hézoua 1 site in Tunisia illustrates a situation in which most services for irrigators are insufficient.^[2] While the water service is now satisfactory^[3] (although it is in decline), other services are insufficient. Furthermore, the services provided do not seem to meet the genuine interests of irrigators. As a matter of fact, these services incite farms to over-specialize in order to produce high-quality dates at a lower cost, whereas what irrigators actually want is to maintain more resilient, diversified farms. Most of the farms are in great difficulty, and some of the older ones are on the verge of abandonment. All of them engage in sales of standing date crops, which puts them at a disadvantage in the balance of economic power, since the value chain is dominated by a handful of exporters. A new “deconversion”^[4] trend is emerging. This study reveals how one of Tunisia’s flagship sectors—the country is the world’s leading exporter of dates—is facing a contradictory situation, based as it is on family farms in great difficulty and an ecosystem under threat. The operational service diagram proposes to start out by tackling the sales and marketing constraints by testing the implementation of a credit system pledged on stock (a warehouse receipt system, or WRS, dubbed “warrantage”), by regulating the sector, and by helping to bolster farmer organizations within the interprofessional framework. The operational diagram also suggests other avenues: encouraging more flexible land tenure systems (e.g. leasing), setting up private equipment companies, providing consulting services for management, etc.

Lessons learned

Crafting a service ecosystem...

Irrigated farms are affected by a multitude of factors, including the organization of land tenure and farming practices, the function of the irrigated area, governance of the territory and value chain, changes in social, political, and economic contexts, climate change, and so on.

This complexity is not properly addressed by irrigation projects and policies, which are often dominated by infrastructure development or value chain approaches. The notion of “services to irrigators” in projects and policies is often reduced to just water service, with the farmer as a mere irrigator, when, in reality, the family economy is more complex. This study demonstrates the need for a service ecosystem. Services should include irrigation water, land tenure, financing and insurance, procurement, marketing and certification, extension and advisory, research, representation, mechanization, etc. When such services are available and accessible, the irrigated system’s performance increases

dramatically. The Stung Chinit case demonstrates that the gradual rollout of services has brought increased development to the irrigated area; something that the availability of irrigation alone had not been able to trigger.

The “services to irrigators” approach therefore provides a highly operational way to address the complexity of an irrigated system.

The initial deployment of services should follow a determined pattern, or even a chronology, specific to the local situation and its potential changes. Once the services have been set up, they should then be adjusted on a regular basis.

...that genuinely responds to irrigators’ interests

It would be reasonable to assume that services for irrigators genuinely serve the interests of irrigators, yet that is not always the case. The value chain approach steers service provision to suit the interests of a priority value chain, engendering a situation that becomes even more problematic when there are power imbalances that put irrigators at a disadvantage. Such value chain-oriented service management may, in turn, guide farms’ potential strategies and lock them in. The case of Hézoua 1 shows that farms are increasingly specializing in date crops, which makes them more vulnerable, whereas irrigators would actually prefer to maintain greater diversity (dates, market gardening, cereals, horticulture, livestock).

To ascertain whether the existing services truly align with the interests of irrigators, those interests and resources must be analyzed properly, through typology analysis for each type of irrigator in an irrigated area. Analysis of this kind also reveals the power dynamics at play in the area, territory, or value chain.

Services for many actors, on many levels...

Services are provided by private commercial actors, government and local authority services, and the agricultural profession, as well as from farmer to farmer. There is no “one size fits all” model since the options available are based both on the specific situation in each case and on the prerogatives and goals of each type of actor. However, while private services and the agricultural profession contribute to the immediate performance of farms and the irrigated area, they do not always guarantee the sustainability of the irrigated system over the medium and long term.

Therefore, the distribution of roles among actors is a crucial element of the operational framework for service development. Such distribution may be grounded in the comparative advantages for actors involved, but it must also safeguard common goods (or the public interest), preserve political or territorial orientations, and include long-term considerations.

Multi-actor interventions that are interconnected at micro, meso, and macro levels are therefore necessary. While the notion of services is better suited to micro and meso levels, it must imperatively be coordinated with public policies at macro level, in such a way that the three service levels—micro, meso, macro—reinforce each other.

[2] Its rosette diagram is on p24 of the summary report <https://www.comite-costea.fr/production/finalreport-study-on-services-to-irrigators/>

[3] The Hézoua 1 site has recently undergone rehabilitation and consequently has a fairly good water service, which distinguishes it from other oases in Tozeur.

[4] Transition from organic farming to conventional farming with synthetic inputs.

...that respect the public interest and environmental and social issues

The study highlighted the existence of environmental and health problems on both sites: in Tunisia, a decline in the fossil aquifer, loss of biodiversity and ecosystem functioning in the oases, and deconversion; in Cambodia, pollution of terrestrial and aquatic ecosystems and soil degradation.

In Tunisia, the study also brought to light significant social risks: if oasis family farms continue to go bankrupt, the value chain may undergo a transformation, shifting from a sector that supports 10 % of the Tunisian population to one that relies on just a handful of private production companies.

Notwithstanding, on both sites, short-term economic considerations prevail over social issues (despite their urgency, in Tunisia), and the environmental issues that are emerging in both countries. In the end, the sustainability of irrigated systems appears to be under threat, sometimes even in the short term, and the service offer does not guarantee the sustainable development of irrigated systems.

In this respect, the study revealed two stumbling blocks: on one hand, the limitations of strictly value chain-oriented approaches to irrigation development; and, on the other, the consequences of weak regulation of interventions by the private commercial sector.

The study therefore underlines the need for governmental intervention (both at national level and by local authorities), such that the state can act as a guarantor of the public interest and medium- and long-term interests, while striking the right balance between economic, environmental, and social issues.

In conclusion

Applying the notion of services and analytical methodology helps shift the focus squarely back on irrigators. The service rosette diagram, placing irrigators at the center of a service ecosystem, is a simple visual tool (downloadable from the COSTEA website) that presents the complexity of an irrigated system in a comprehensible, practical manner.

As development challenges call for ever greater efficiency and effectiveness, the current tendency is to resort to overly simple approaches that turn out to be too hasty, sector-specific, and standardized. To counter this, the study calls attention to the importance of systemic and comparative agricultural approaches, diagnostic tools (such as farm typologies), field surveys, and the analysis of power dynamics.

The study also demonstrates the medium- and long-term limitations of strictly value chain-oriented or infrastructure development approaches to irrigation, and of conventional production models such as the Green Revolution, and it calls for agroecological transitions in these irrigated systems.

Finally, while this service analysis has been drawn up for the irrigated sector, it can also be applied to the entire rainfed and irrigated agriculture, forestry, rural, and fisheries sector.

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