

Public-private partnerships in irrigation – how can smallholders benefit?

Although the positive effects of irrigation on food security and poverty alleviation are well-documented, public investments in this area have been on the decline since the 1990s. Comparing irrigation schemes in Zambia and Morocco, our authors have examined whether private sector investments are suitable to fill this gap and what preconditions have to be met to ensure that PPPs offer advantages for small-scale farmers.

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Switching to irrigation requires investments in water storage and irrigation infrastructure, but also technical expertise.

Photo: Jörg Böhling

The benefits of irrigation are undisputed. It can help to improve and stabilise agricultural productivity, thereby contributing to food security and to resilience against climate change. Irrigation – either full or supplementary – reduces reliance on erratic rainfall, improves drought resilience and increases yields; it extends cropping periods and cycles, allows the cultivation of a broader spectrum of crops and provides stable conditions for applying further yield-increasing means (fertilisers). Irrigation also encourages farmers to invest, on the one hand, and financial institutions to provide credits, on the other. Moreover, as evidence from Asia shows, irrigation has the potential to reduce poverty rates and income inequalities. But mobilising investments is key to taking ad-

vantage of this potential, which can be a problem, especially in sub-Saharan Africa.

Tapping the irrigation potential in Africa

Throughout the entire African continent, only about 13 million hectares of arable land is under irrigation today, which is equal to six per cent of the total cultivated area (compared to 37 per cent in Asia and 14 per cent in Latin America). Of this, more than two-thirds is concentrated in Egypt, Madagascar, Morocco, South Africa and Sudan. Looking at sub-Saharan Africa (SSA), only 3.5 per cent of the area cultivated is equipped for irrigation.

According to the UN Food and Agriculture Organization's (FAO) projections up to 2030, the irrigable area can be substantially expanded. In Zambia, for instance, only about 10 per cent of the economically irrigable potential is under irrigation, which is around 155,000 hectares. Mozambique's potential is estimated at 3 million hectares only 120,000 of which is already connected to water infrastructure, while only 62,000 is in use. Note that all estimations of actual and particularly potential irrigation areas in SSA are subject to large data uncertainties.

However, switching to irrigation requires not only costly investments in water storage and irrigation infrastructure, but also technical expertise and funds for network maintenance and effective water payment schemes. In addition, water alone is not enough to reap the full benefits of these efforts, which call for additional investments and the use of (organic and chemical) fertiliser, new varieties and crops, and new value chains for inputs and outputs.

According to the Alliance for a Green Revolution in Africa, in SSA, about 70 per cent of the population are smallholder farmers who are not well equipped to meet these requirements. Additionally, constrained public budgets and the lack of human resources in agriculture and water administrations limit public sector support to smallholders. This situation has resulted in under-investments in irrigation since the 1990s, and there is no indication of substantial improvements in the coming years. How then can irrigation be expanded, and which role can private sector funding play? And will smallholders benefit from these investments?

Bridging the investment gap

International finance institutions such as the World Bank or the Asian Development Bank have promoted private sector involvement in irrigation. However, the private sector has been proven to be very reluctant to enter into

ZAMBIA'S KALEYA AND MANYONYO SCHEMES



Photo: Walting Scheuermann

The **Kaleya irrigation scheme** has 161 farmers cultivating 2,165 hectares in Southern Zambia's Kafue River basin. Irrigation infrastructure was publicly financed, but operation and maintenance has always been

the responsibility of the Kaleya Smallholders Company Ltd. (KASCOL), a private company owned by independent individual and institutional investors. Smallholder farmers collectively hold 19 per cent of the company's shares. KASCOL owns the land, and recruits farmers by offering them land on a four-year lease base. It holds a water-use permit but receives additional bulk water in drought periods supplied by Zambia Sugar Plc. at an advantageous fee. On-farm irrigation and farming operations are carried out by farmers on their individual (leased) plots. Benefits from this arrangement have been manifold, but farmers particularly complain about the short-term land lease arrangement.

The **Manyonyo smallholder irrigation scheme** is located in the same river basin. It was initiated by the Zambian Ministry

of Agriculture, who assisted farmers in forming a liability company and running the irrigation scheme. Each of the 145 households contributed four hectares of their land which are clustered into and managed as one single farm. The farmers maintain their property as well as individual land titles, thus guaranteeing membership to the scheme but also reversibility of membership. The company holds a group permit for water abstraction from the river. The water infrastructure is constructed by using public funds and is leased out to the farmer-company through a suitable PPP arrangement. The company is a stand-alone firm, but its production is sold to nearby Zambia Sugar Plc. The model provides security for smallholders vis-à-vis the (farmer-owned) company and its management.

financing, construction, operation and maintenance of irrigation schemes, at least in SSA and if it is not for a single plantation under its own single management. There are several reasons for this lack of engagement. First of all, this is because enterprises are often specialised and exert their activities (e.g. irrigation management, cropping, transformation) in joint ventures. Second, and even more importantly, public agencies are often involved in such ventures. The reasons are the high complexity and associated challenges of irrigation projects in these settings: finding 'bankable' solutions for infrastructure investments in insecure economic contexts, highly complex and partly informal systems of land tenure and established, traditional practices of water allocation. Moreover, the "common pool resources" character of water and – correspondingly – of irrigation schemes and potential environmental effects (for example unsustainable water use or salinisation of soils due to poor water management practices) increase investment risks.

In many instances, it is farmers themselves (as land-owners or users) or governments (as custodians of land) who push private sector companies into accepting farmers and their associations as part of the business model. The reason for this is that it allows increasing inclusiveness and equality, technical spillovers, reduces political resistance and enables measures to prevent non-reversible deals, which leave whole regions at the mercy of one or just a few companies. The involvement of private companies in large-scale irrigation is thus often embedded in cooperation agreements with national and/or local governments, in some cases

development agencies, and farmers or farmer organisations.

Making PPPs more inclusive – the example of Zambia

So far, there have not been many examples in SSA of PPPs involving irrigated agriculture. Some of them are found in Zambia, which has developed models of inclusive PPPs with smallholders. These PPPs have in common that smallholders have established farmer-owned liability companies to run profitable commercial businesses. The farmers are organised in water user associations, which are represented on the management board of irrigation projects along with representatives of the government and the farmers' union. While the farmers hire irrigation professionals to run the irrigation scheme profitably, the management units organise agricultural production in parallel, assuring professional cultivation.

These farmer-owned companies are often linked to large enterprises (e.g. Zambia Sugar) as contract farmers (Kaleya Smallholders Company Ltd.), but some, such as the Manyonyo smallholder irrigation scheme, are also stand-alone firms (see Box on top of page). In one or the other way, smallholders contribute to debt financing (cash or land contributions) and share operation and maintenance costs of providing irrigation services. Individual farmers can benefit from improved income, job opportunities and the dividends generated by their equity stake in the collective company. Finally, involving local communities in PPPs

is in many cases also a means to integrate them in larger value creation and rural development by improving e.g. access to electricity, health services and transportation.

The projects in Zambia successfully address two other common challenges of irrigation schemes: inequitable water distribution and frequently unclear water and land ownership and use rights. Concerning water distribution, farmers at the head of a canal are often privileged compared to 'downstream' users at the tail end. In cases where water provided by the PPP does not cover all water needs, financially strong farmers are privileged as they can invest in deep drilling to complement this, while poorer farmers cannot do so and are in addition faced with rapidly sinking water tables due to the boreholes of their rich neighbours. Such situations arise where farmers are very heterogeneous, as in the Moroccan El Guer-dane case (see Box on page 20).

The collective ownership chosen for the PPPs in Zambia instead provides for an innovative solution to these two distribution challenges; at least until now, inequitable water distribution has not been reported. The collective model also helps to address the challenging issue of unclear water and land use rights, which is particularly complex in settings with many smallholders. Hybrid and sometimes contradictory forms of collective and individual land, water and other resource ownership and user rights coexist in a continuum from customary tenure systems to formal ownership systems, often with the state as final custodian and owner. Mostly, these tensions are not clarified and

MOROCCO'S EL GUERDANE PROJECT



The **El Guerdane** project, operational since 2009, is considered as the first public-private partnership in irrigation in which the private partner participates not only in the financing

and construction, but also in the operation and maintenance of the system. In contrast to the *Zambian cases*, the private partner is not involved in agricultural development.

A complex of two dams feeds a 90 km irrigation canal to carry 45 million m³ of water per year to the 300 km distribution network that makes up the El Guerdane scheme situated in a highly water-scarce valley. The project is designed to supply 597 citrus farms, covering 9,600 out of the 30,000 irrigable hectares. The 80 million US dollars of investment costs was covered by the Moroccan State (48%), the National Investment Company (SNI, 44%) and the farmers involved (8%). However, the project has contributed to in-

creasing inequalities between family farming and agro-investors: the investment costs required, the type of crop targeted (citrus fruits), the quality requirements for export and the political choice to initially restrict the call for tenders to pre-selected farmers have marginalised smallholders. The average size of project farmers' plots is one indicator of this trend: they cultivate an average of 16 ha – more than five times more than the average size of farms in the project's immediate surroundings in Taroudant. Moreover, the project provides water to only a small proportion of the farmers in the region (597 farms, equivalent to about 11 per cent of the total number of farms in the area).

formalised. The resulting uncertainty is detrimental to investments, regardless of who invests, not only in irrigation but also in all kinds of machinery, equipment and long-term land improvement. The way land can or cannot be used as collateral has implications for the ability of individual actors to engage in PPPs. In the *Manyonyo PPP*, for instance, where farmers hold individual land-use rights, it is prohibited to use land as collateral for loans so as to avoid the danger of farmers losing the land to “bogus investors” offering “slave loans”. Banks seem to be ready to provide credits relying on the soundness of business models.

What are the success factors?

Successful irrigation PPPs which are not only able to mobilise investment but also provide long-term perspectives for local smallholders require sound design and monitoring of networks and contracts with respect to equitable cost-benefit sharing and environmental impacts. However, many smallholders as well as local administrations currently lack the capacities to fully oversee potential impacts of such projects and related contracts. Similar to PPPs implemented in the drinking water sector, local administrations may find themselves caught up in highly complex contracts to their disadvantage (as has even happened in Europe with contracts concluded for the provision of water services). Taking smallholders' concerns, but also local government and administrations' capacities, into account when developing PPPs in irrigation is therefore a key prerequisite for achieving mutual benefits.

Given the important role of governments in irrigation PPPs, they must be pro-active in creating security and stability for investments

in relation to land- and water-use rights, in protecting public goods and the smallholder economy. Development cooperation can support local public and non-state stakeholders by providing capacity development and specific expertise in order to secure fair, equitable and environmentally sustainable conditions of PPP implementation.

Lessons from PPPs implemented so far also teach us to look beyond the irrigation scheme as such since potential socioeconomic and environmental benefits and threats extend way beyond the geographical area of the scheme. Primarily targeting financially strong farmers or not actively supporting the smaller ones creates an unequal race for access to potentially irrigable land and sometimes scarce water resources. Neither does it necessarily assure an optimal return on investment since smaller farmers can be very efficient in value and employment creation, also compared to larger entities. Finally, the public sector must ensure the long-term ecological viability of a project as well. Many of these insights on PPPs confirm earlier findings on the effects of irrigation on poverty reduction. In Asia, the International Water Management Institute (IWMI) identified irrigation as an important potential contributor to poverty alleviation – but the magnitude of these impacts strongly depended on equity in land and water distribution, good infrastructural conditions and improved cultivation technology, cropping patterns, and the marketing of inputs and outputs.

Thus, PPPs in irrigation need to be embedded in comprehensive development plans and include specific support measures to ensure sustainable and equitable development. This may include access to extension services and financial products, input supply, and – above

all – access to stable markets. The PPPs we reviewed in SSA have in common that smallholders have established farmer-owned liability companies to run commercial businesses. These companies have entered into contracts with private sector companies for irrigation management, service provision and market access. Farmers are represented on the management boards of their companies. For such arrangements, smallholders need long-term support along with assistance in designing contracts and acquiring management skills. If one compares the *Zambian schemes* with the Moroccan *ElGuerdane*, these PPPs are better characterised as PPPs in irrigated agriculture, i.e. investments in agricultural production that include irrigation components.

In short, PPP arrangements require country- and site-specific solutions and must address the risks of the various parties involved, including nature, to ensure that such projects are development-friendly and economically viable while protecting natural resources.

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