Deutsches Institut für Entwicklungspolitik
German Development Institute
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Briefing Paper 7/2017

Unlocking the Irrigation Potential in Sub-Saharan Africa: Are Public-Private Partnerships the Way Forward?

Summary

Irrigation 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/droughts 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 (fertilizers). Irrigation also encourages farmers to invest, on the one hand, and financial institutions to provide credits, on the other. Moreover, there is evidence from Asia that irrigation has the potential to reduce both poverty rates and income inequalities.

Several sub-Saharan African (SSA) countries still have a significant potential for expanding the area under irrigation. While small-scale irrigation can be managed by individual farmers or farmer groups (though with some difficulties and risks), for larger schemes – which tap larger potentials – this is hardly an option: public financial sources are constrained, and public management of irrigation schemes has shown many disadvantages.

This Briefing Paper argues that, instead, public-private-partnership (PPP) projects in irrigation can be beneficial for smallholders, rural communities, investors and the public if certain conditions are met. The challenges to realising inclusive PPPs are the following:

Due to the "public good" character of water, the "common pool resources" character of irrigation schemes, and SSA land tenure systems, governments must play a pro-active role in creating security and stability for investments in relation to land- and water-use rights and in protecting public goods.

Investing in water infrastructure alone is not sufficient in SSA countries. It must be embedded in a comprehensive support package including access to extension services and financial products, input supply, and – above all – access to stable markets.

All successful 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 such as vocational training along with assistance in designing contracts and acquiring management skills.

PPP arrangements require country- and site-specific solutions and must address the risks of the various parties involved if it is to be ensured that PPPs are development-friendly, are economically viable and protect natural resources.

Insufficient food production affects food security in sub-Saharan Africa

Agriculture in many SSA countries has not yet realised its full development potential. This relates both to predominantly rain-fed and to irrigated agriculture. This situation has serious implications for food security due to low production, for subsistence and markets, for income and job opportunities, for trade balances, and in fact for the stability of the entire food system.

Irrigation can help to improve agricultural productivity and stability thereby increasing food security and resilience to climate change. This can be achieved directly via access to water which reduces reliance on erratic rainfall and droughts and increases yields; extends cropping periods and cycles per year; allows the cultivation of a broader spectrum of crops; provides better and more stable conditions for applying further yield-increasing inputs such as fertilizers; and finally encourages farmers and credit-providers to trust in investing in agriculture. Evidence from Ethiopia and Tanzania, for example, shows increases of farm incomes by 50 and 86 per cent respectively. In Asia, poverty rates and income inequalities are lower in irrigated than in rain-fed settings.

However, it is not only the producers who are suffering from low agricultural productivity: there are also negative macro-economic effects. SSA countries' food imports are steadily increasing (though the share in total imports remains constant and relatively small); thus, valuable foreign currency must be spent on food imports instead of on investments, while many farmers lack access to attractive urban markets, while the respective value addition is lost for the economy. In parallel, Africa is deprived of export shares in international agricultural markets and thereby also of significant income and foreign exchange earnings. The lack of competitiveness means forgone opportunities, particularly for small farmers who are the main producers not only of food but also of export crops (cotton, coffee, cacao, tea). Since poverty and food insecurity are overwhelmingly an issue of rural populations, weaknesses in agriculture explain much of the extreme or high rates of poverty and food insecurity in. The impact of climate change adds further uncertainty to agricultural production due to changing temperature, precipitation, hydrological flows, groundwater recharge and extreme weather events.

A potential yet to be developed

One important way to address both low agricultural productivity and the negative impacts of climate change in SSA is to expand irrigation in locations where water is available, soils are suitable, and farmers either already have the productive potential or can be supported to develop it. On the whole continent, including Northern Africa, only about 13 million hectares of arable land are under irrigation which is equal to 6 per cent of the total cultivated area (compared to 37 per cent in Asia, 14 per cent in Latin America). Of these, more than two-thirds are concentrated in Egypt, Madagascar, Morocco, South Africa and Sudan. Looking at SSA, only 3.5 per cent of the area cultivated is equipped for irrigation.

According to FAO projections up to 2030, the irrigable area can be expanded by 40 million hectares in some SSA countries of (e.g., Malawi, Ethiopia, Zambia, Swaziland) given that water resources are available. In Zambia, for instance, only about 10 per cent of the economically irrigable potential is under irrigation, which is about 155,000 hectares. Mozambique's potential is estimated at 3 million hectares of which 120,000 are already connected to water infrastructure, while only 62,000 are in use. These figures show that large parts of SSA's agriculture suffer from economic and not from physical water scarcity and hence lack investments in water storage and distribution infrastructure.

Most land suited for irrigation in SSA is already used by smallholders, and smallholder agriculture is in most cases better able to assure pro-poor outcomes. In contrast, large-scale investment in agriculture often competes with smallholders. However, while irrigation provides opportunities, it also carries new risks, for instance, for investment, and of conflict. Therefore, we argue that projects in new water storage and irrigation facilities should strive to specifically include smallholders in a way that carefully balances their additional risks.

Why use public-private partnership (PPP) projects in irrigation?

After World War II and until the late 1980s, governments and international financing institutions believed that the state should stimulate economic growth by financing and managing large irrigation schemes. However, high investment costs, fiscal constraints, and the poor performance of publicly financed and managed irrigation schemes compromised this path of government-led development of the irrigation sub-sector. There is ample evidence that public financing and management of irrigation systems has in many cases been inefficient and inequitable, unable to secure maintenance of infrastructure, creating high reliance on subsidies to finance operation and maintenance (O&M) costs while poorly managing water both off- and on-farm. Many harmful environmental impacts have emerged from poor water management practices such as salinisation of soils and water-logging of fields, particularly in Asia.

During the 1980s and 1990s, in the wake of financial crises and structural adjustment programmes, the irrigation sector increasingly came under pressure to reform. The World Bank and other international organisations and research institutes pushed for transferring O&M responsibilities to farmer organisations. Nonetheless, with the exception of a few advanced countries (e.g., Mexico, Turkey, New Zealand and the United States), the success of irrigation management transfer (IMT) has been limited. The impacts of IMT on agricultural productivity, farm incomes and infrastructure

maintenance have been mixed at best. Often IMT did not lead to increases in cropping intensities or yields. Examples from SSA also show that the gross area irrigated declined; that O&M costs (which should not exceed 5 per cent of gross income) continued to be excessively high; and that many water-user organisations proved unsustainable in the long run, unable to undertake necessary major maintenance activities due to inadequate management skills and financial capacities of farmers (Shah, van Koppen, Merrey, de Lange, & Samad, 2002). Very few new large-scale irrigation projects were realised in SSA.

To conclude: Experiences with both approaches to large-scale irrigation – public and IMT – have rarely realised their potential. Lack of capacities, irrigation management skills, agricultural production, and marketing know-how are particularly constraining in poor countries in both governmental and farmer organisations. Against this background, a call for an increase in the role of the private sector in investing and managing irrigation schemes has emerged. While some observers such as the World Bank (Mandri-Perrott & Bisbey, 2016) see this as a promising option to mobilise necessary financing and supposedly better management, others warn that the private sector could further marginalise smallholders with negative repercussions on poverty, food security and broad-based rural development. However, as a matter of fact, up to date only a few irrigation PPPs have been established.

Different approaches to PPPs in irrigation

Due to the "public good" character of water and the "common pool resources" character of most irrigation schemes, it is rarely possible to go for purely private irrigation investments. In most cases, the state must play a pro-active role in allocating water-use rights, administering land (re-)allocation, contributing to and facilitating finance for infrastructure, and mitigating conflicts of interest between large private actors and local communities and farmers. Thus, investment in irrigation must often be organised as a PPP project.

On the African continent, PPP arrangements are diverse, both in scope and design. Local conditions and contexts vary tremendously, not only in terms of water and land availability, suitability and the willingness of the stakeholders to participate, but also regarding the variety of goals of PPPs. A clear divide exists between the North African and SSA countries due to their differing agro-ecological conditions, availability of water resources, irrigation traditions, and the capacities of the private and public actors.

Morocco's ElGuerdane project, a much-cited example of an innovative irrigation PPP, focuses exclusively on investing in irrigation infrastructure and scheme management. In a highly water-stressed region, it involves a 10,000 hectares' irrigation scheme, and the construction and maintenance of a transfer pipe providing half of the water needed to cultivate citrus fruits. Fruit production and commercialisation is left entirely to farmers. However, while the project managed to save some of the drying plantations, mostly owned by large landowners, it also reinforced the marginalisation of smallholders. Its environmental impact is also disputed (Houdret, 2012).

In SSA, Zambia and Swaziland are some of the few countries that have 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. Smallholders are organised in water-user associations and represented on the management board along with representatives of the government and the farmers' union. In both types, irrigation professionals are hired to run the irrigation scheme profitably on behalf of the farmers; the management units organise agricultural production in parallel, assuring a high value of production. These companies are often linked to large enterprises (Zambia Sugar) as contract farmers (Kaleya Smallholders Company Ltd), but some are also stand-alone firms such as the Manyonyo smallholder irrigation scheme. In one or the other way, smallholders contribute to debt financing (cash or land contributions), and share the O&M costs of water infrastructure.

Individual farmers can benefit from improved income, job opportunities and the dividends generated by their collective equity stake in the company. Finally, involving local communities in PPPs was in many cases also a means to involving them in larger value creation and rural development (thus improving access to electricity, health services and transportation). In Swaziland, the irrigation PPPs are part of community (chiefdom) development plans.

Challenges of PPPs in irrigation

Despite the opportunities of PPPs, numerous challenges for private investors, private operators, smallholders and governments exist, and these are by no means trivial.

First, contracts between farmers and management companies require capable staff, not available everywhere in SSA, along with farmers' organisations capable of supervising the companies. Yet many farmers do not have the capabilities to understand complex formal entities and systems.

Second, investing in irrigation infrastructure is a complex and risky endeavour: irrigation schemes are "common pool resource" systems where managing water, maintaining infrastructure and enforcing financial obligations are a challenge – for private operators even more so than for public managers. Inequitable water distribution is common in many irrigation systems where farms at the head of canals enjoy the advantage of location over farms at the tail end, that is, downstream. In the Zambian and Swaziland PPPs, the farmer-owned liability companies hold water-use rights and, since individual plots of land are pooled into and operated as one farm unit, inequitable water distribution

has not yet been reported. But if plots are individually cultivated, this problem persists.

Third, land tenure and land titles directly affect investment security, no matter who invests (Brüntrup, 2014). Land tenure in SSA is complicated: customary tenure is dominant, where local chiefs and communities are important players, and where farmers have only informal use-rights, while formal state ownership is often overlapping. Uncertainty of tenure poses significant challenges for realising smallholder PPPs.

Fourth, PPPs in irrigation create financial needs: for irrigation infrastructure (very long-term); for agricultural machinery and possibly for processing (long- to very long-term); and for inputs of farmers (seasonal); but also of processors and suppliers (short- to long-term). 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, Zambia, for instance, where farmers hold individual land-use rights it is legally not allowed 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. In Swaziland, where the chiefs allocate land to their "subjects" following traditional rules, they have given individual land-use rights on Swazi Nation Land (Chief Letters) which can serve as a collateral vis-à-vis local banks.

Conclusions

PPP projects in irrigation represent one way to unlock the agricultural potential in SSA countries and, at the same time, promote smallholder agriculture. However, due to the peculiarities of SSA's agriculture and business environment, investing in water infrastructure alone is not promising. It must be embedded in a comprehensive support package including, among other components, access to extension services, input supply, on-farm development, access to stable markets for the products, as well as to a variety of financial products. It is up to the governments to co-finance water storage and irrigation infrastructure and create favourable conditions for all stakeholders, and to provide support and incentives for managing water in a sustainable way.

Key issues in this respect are creating security and stability for investments in relation to land tenure and access to water. Since irrigation infrastructure links formerly independent farmers, inclusive business models should be developed and supported. However, this approach requires careful contract formula, capacity development, and representation. Support by governments or other trustful entities vis-à-vis the more powerful players is needed.

At the same time, if farmers participate in PPPs, they are exposed to new risks that must be carefully assessed, also as regards those of continuing rain-fed farming. In the end, only the farmers themselves should decide whether they engage in PPPs.

All in all, PPP arrangements require country- and site-specific solutions to balance the risks and benefits of the different parties involved and for making sure that, at the end of the day, PPPs are not only economically viable but also development-friendly and manage resources sustainably.

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Published with financial support from the Federal Ministry for Economic Cooperation and Development (BMZ)

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ISSN 1615-5483