

# PPPs in Irrigation

Full Description

## **Key Commercial Risks**

Irrigated agriculture projects, especially those involving smallholder farmers, are difficult to fund on a commercial basis from day one because they cannot deliver short-term predictable financial returns. Unlike other sectors, irrigation projects, are self-contained investments which are linked solely to the local off-take, i.e. the viability of the agricultural activities using the water. Infrastructure providers are thus exposed to market and commodity risks. Commitments, through management or finance, will only be forthcoming if private-sector partners can have a degree of certainty that they will be able to recover their investments.

Since water is one input into the production process, in addition to management, credit, fertilizer and access to market, the ability and willingness to pay (WTP) for water services must be considered in the context of overall farmer capacities.

The less certain private partners are that they will recover their time and financial commitments, the lower their appetite for participation and the greater the need for concessional or public-sector resources. Farmer capacity and agricultural productivity are themselves only one determinant of the private-sector's ability to enforce financial obligations of project participants. This means mechanisms for payments between smallholders, farm managers and irrigation providers; overall incentives for farmers to meet obligations under the scheme; and the design of land arrangements such as the terms of access to consolidated land, selection of farmers for high potential allocations, and procedures to incentivise farmers who do not pull their weight. The institutional organisation of farmers will determine these features, for example through cooperatives, trusts and water user associations.

## **Typical Relationships Between Private Operator and Farmers in PPPs**

The following are the main types institutional arrangement that are typically used in Irrigation public-private partnerships (PPPs):

**Commercial farmer as a private irrigation operator:** Smallholder farmers in the command area would be given the option of becoming outgrowers to the large commercial farmer. Engaging farmers as outgrowers involves:

- Providing them with seeds and other inputs required to grow a certain crop
- Training them in growing the crop
- Specifying quality standards the harvested crops must meet
- Purchasing the harvested crops from them at an agreed-upon price.

**Farmers responsible for maintaining the tertiary network:** The private operator will be responsible for all aspects of operating the irrigation system up to the farm level, and of maintaining the system up to the tertiary canals. Farmers, through their water user associations (WUAs), are responsible for maintaining the tertiary network.

The private operator is responsible for operating and maintaining the entire system, and farmers pay a tariff that covers operating and maintenance costs. Farmers are not responsible for operating or maintaining the irrigation system.

## **Main Contractual Forms of PPPs in Irrigation**

The most commonly used contractual forms of PPP in the irrigation sector:

**Operation, Management and Maintenance (OMM) contract** - The private-sector is engaged to undertake operation, management and maintenance of infrastructure services for defined recipients. The private-sector provides a service for which it receives a fee (either from the government or from users). Where rehabilitation or construction works are required, they can also be part of the contract. Assets are publicly financed, and this is an appropriate form of contract where there is limited scope to raise private capital.

**Infrastructure concession** - The private-sector is engaged to raise commercial finance for infrastructure development and then construct, operate, manage and maintain the infrastructure. Investment and financing costs must be recovered through fees (either from the government or from users). End user risk is significant in irrigation projects where often the users are not fully defined at the beginning of the project (it depends on how many farmers take up the water from the system). It might be possible to share end user risk between the public and private parties, for instance with a guarantee on minimum revenue. The investment may be undertaken in whole or in part by the private sector where for instance there is grant funding available to bear some of the investment cost.

**Farm service agreement** - The private-sector can also partner with smallholder farmers and communities for the provision of farm-level services. Services might be on-farm, such as planting, harvesting and water application; or off-farm, such as storing, processing and marketing (e.g. outgrower services). Such farm services, by improving the agricultural performance of water users, are likely to improve the viability of irrigation infrastructure. The level of investment private finance required depends on the services provided. Farm services can be integral or separate from infrastructure OMM.

**Hub farm agreement** - The private-sector can be engaged to undertake commercial agricultural production through a land concession or lease. This might be on unoccupied land owned by the government or third-parties, or community land held under collective title (or especially consolidated) and leased in return for a fee of share in commercial operations. The hub farm has purely commercial aims, and will require a certain scale in order to offer commercial opportunities (especially for food crops). Private capital is required for on-farm investments, while irrigation fees can reflect any or all infrastructure related costs (e.g. OMM, investment and finance).

Key characteristics of a project that determines the PPP model include the extent of investment needed for new assets, the experience of smallholder farmers, and the (social, technical and commercial) feasibility of hub-farm investments.

## **Key Legal Issues that Arise in Irrigation PPPs**

There are a number of legal and commercial issues that will affect how these projects move forward and are structured. While some of the legal issues are not confined to irrigation PPPs they can take on a new dimension and complexity when applied to irrigation:

**Land ownership** – all irrigation projects are dependent on land ownership – both in relation to the land that is needed for the project, and also in relation to the customers for the project, the farmers, and their legal interest in the land. Some countries limit land ownership to locals or may prohibit ownership in private hands. For instance, in Ethiopia, rural land is owned by the government and only individuals who were willing to farm personally are entitled to possess land.

There may also be difficulties with establishing land title, particularly in countries where there are significant customary land rights – such as Ghana and many other sub-Saharan African countries. There may also be restrictions on land use, irrigation or types of irrigation may be restricted – and the rules may vary within a country from state to state or county to county.

**Water extraction** – there may be limitations on levels of water extraction, both at national and international level. If extraction from a river or other water source is subject to international waterways, then there may be restrictions on the amount of water that can be extracted. For instance, countries in the Nile Basin are limited by treaty under the Nile Basin Initiative to the amount that may be extracted and for what purpose. In federal countries, water rights may be licensed and, for instance in the case of the USA, traded between states.

It may also be difficult to determine who has the power to grant permits to extract the water. This may involve the ministry of water or the ministry of the environment, or sometimes both. Water user associations may also play a role. In cases of scarcity or where there are systematic droughts, there may be a priority imposed by law or regulation on which users get water in times of shortage. This may be particularly relevant where there are competing users – for instance hydroelectric power projects or downstream users.

The regimes for charges for water extraction may be complex and/ or vague. It may be difficult to determine if and how they are these set, who sets them and whether there are different rules for charging for raw water and for irrigation. These will be key issues in a PPP as the private provider will want to ensure a steady revenue stream and so will want to be sure of the price that it is buying raw water, the price that it can on sell irrigation water and the quantities that it can extract and sell.

**Public Sector Counterpart** – in irrigation PPPs it can be difficult to ascertain which public institution will be responsible for developing the project and the signatory to the project agreement - in most emerging markets where PPPs have been used for developing irrigation systems, the national entity in charge of irrigation services would be the counterparty to the PPP contract. In Egypt for example, the Ministry of Water Resources was the relevant counterpart for the proposed West Delta irrigation project. However, as noted above, where there are competing claims from the authority responsible for water resources or the ministry of environment, this can be confusing. It may also be a more local rather than a national entity that is responsible for the project. Another key issue in this regard is whether the relevant entity has the power to enter into PPP arrangements. In the case of a sub-national authority or a parastatal, it may need express power to do so.

There are also the usual legal considerations that need to be checked when developing PPPs in any sector, such as legal restrictions on the type of PPP arrangement that can be entered into, relevant procurement rules for entering into PPPs, existence of restrictions on foreign investment, taxation and potential for tax holidays and the ability to assign rights such as security and [step in rights](#) to lenders.

## **Examples of PPPs and Sample Agreements**

**Brazil: [Pontal Public-Private Partnership Irrigation Project \(Projeto Público de Irrigação Pontal\)](#)** - Bidding documents for public-private partnership (PPP) irrigation project in the Pontal region of Brazil. The English versions of the documents are free translations from Portuguese and were published for informational purposes only. **The project did not proceed as planned.**

This project sought to establish a public-private partnership (PPP) for common use irrigation infrastructure in an area of 7,717 hectares of irrigable land for commercial agriculture. The project is located in Petrolina, a pole of irrigated fruit production and exportation, in the Pontal region of Brazil, State of Pernambuco. The government would cede the land and the existing infrastructure, already covering a significant part of the target area. The private partner would operate, manage and further develop the common infrastructure (70 % has been built by the government) to ensure (1) that the area is fully irrigated within six years of the date of signature of the contract; and (2) that at least 25% of the irrigated land is available for small farmers, who should be integrated into the production chain of the commercial producers that would occupy the remainder of the land. The private partner will be remunerated for the sale of water (through user tariffs) and a capacity payment by the government. The contract duration is 25 years.

**Egypt: West Delta** – The public-private partnership for the West Delta Project is designed as a hybrid scheme based largely on the design-build-operate (DBO) model. The transaction essentially involves contracting a private operator to take over a concession area consisting of about 79,800 hectares in the southern part of the West Delta, to design and construct the system, and to assume full operational responsibility for 30 years, including the associated demand and commercial risks. The public sector will assume ownership of the assets and take on most of the financing-related responsibilities and risks. These include the currency risk associated with a potential devaluation of the Egyptian pound. The decision process from design to execution is innovative in that it involves users from the conception, incorporates a water user council, and adopted a two-part tariff: farmers would pay both an annual fixed fee based on the land area connected and a volumetric fee based on the amount of water use.

**Peru: Chavimochic Irrigation Project** - [Contrato de Concesión Proyecto Irregación Chavimochic \(Spanish\)](#) ). The Chavimochic Irrigation Project - 25-year, co-financed, concession involves improving irrigation in 78,310ha in the northeastern La Libertad region through the capture and distribution of the Santa river's water. The water resources will also be used to feed run-of-river power plants with installed capacity of 68.1MW and potable water treatment facilities able to produce around 4m<sup>3</sup>/s. The concession is a Build-Own-Operate-Transfer where the Government of Peru auctions the land to be irrigated, the proceeds of such sale finance the construction of the irrigation infrastructure, and the private partner develops the necessary works to operate adequate irrigation services. The private partner then manages and charges for irrigation services. The term of the concession is 25 years.

**Peru - Olmos irrigation project** - 2010 [Contrato de concesion Proyecto irrigacion Olmos](#) (Spanish) concession for the design, financing, construction, operation and maintenance of Olmos irrigation project in the region of Lambayeque close to the Peruvian border with Ecuador, aimed at bringing water to the dry Olmos Valley. It will irrigate and open up channeling water from the Huancabamba River, which flows from the eastern Andes, eventually reaching the Amazon River. The aim of the project is to divert the water through the construction of the Limón Dam and along the course of a 20 kilometre-long tunnel, which will run from the eastern to the western side of the Andes to eventually irrigate 5,500 hectares of land. The tunnel is the second deepest of its kind in the world, in places 2,000 metres below the surface of the mountain. This is combined with the diversion of water through concrete tunnels to the 790m cubic metre capacity Palo Verde Reservoir and Dam, from where it will be used to irrigate an additional 38,000 new hectares of agricultural land. A second phase, under a separate concession, will be the construction of hydroelectric power stations powered by waterfalls of up to 400 metres in height to generate electricity in the region. The new agricultural land has been sold by public auction to domestic and international agroindustrial companies.

**Ethiopia - Megech Irrigation Project** - 2012 - management contract for 8 years (operations plus oversight of design and build contract - design and build phase 3 years, then operations 5 years). [Summary of background and PPIAF](#).

## Toolkits and Guidance

- [How To Develop Sustainable Irrigation Projects with Private Sector Participation](#), a practical guide for governments, public authorities, and other interested stakeholders to design and tender sustainable public-private partnership (PPP) arrangements in the irrigation sector. It takes a step-by-step approach in describing what a government needs to do in preparing and implementing a PPP irrigation scheme from inception.
- [Emerging Public-Private Partnerships In Irrigation Development and Management](#), the objective of this paper is to identify the possible role and opportunities for the private sector to participate with governments and farmers in developing and managing I&D infrastructure.
- [Unlocking the irrigation potential in sub-Saharan Africa: are public-private partnerships the way forward?](#), this article is part of the research project “Promoting food security in rural sub-Saharan Africa” of the German Development Institute.

- [Public-Private Partnerships for Irrigation: Expanding Access or Increasing Inequality](#), this policy note present emerging findings from a research project implemented by International Food Policy Research Institute together with partners from Ghana and Tanzania, investigating Models of Public Private Partnerships for Irrigation Development.
- [Public Private Partnerships \(PPPs\) - Improving Performance of Irrigation Services Provision](#), World Bank Institute (WBI) free e-learning course, that introduces the concepts of PPP and their application to the irrigation sector.
- [Opportunities for Private Sector Participation in Agricultural Water Development and Management](#), this study examines ways to increase food security, reduce poverty and achieve economic growth in sub-Saharan Africa with ‘water’ through increased participation of the private sector and public-private partnerships.

## Further Reading

- [Examples of Public-Private Partnerships in Irrigation for Developing Countries](#), supported by the Public-Private Infrastructure Advisory Facility (PPIAF).
- [Exploring Public–Private Partnership in the Irrigation and Drainage Sector in India - A Scoping Study](#), Asian Development Bank (ADB) 2013.
- [Private Sector Participation in the Irrigation Sector in Ethiopia](#), PPIAF support to two activities in Ethiopia has led to private sector participation in the irrigation sector, which is aimed at improving availability of water for farmers, and increasing food quality and security for Ethiopian residents.
- [Morocco : Guerdane Irrigation](#), this note outlines the structure and bidding process for the development of a 30-year concession to improve water security for farmers in Morocco.