

Market-oriented agricultural infrastructure: appraisal of public-private partnerships



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Abbreviations

ACP	African, Caribbean and Pacific countries
ADA	Austrian Development Agency
ADB	Asian Development Bank
AfDB	African Development Bank
AGS	Rural Infrastructure and Agro-industries Division (FAO)
AGST	Agricultural and Food Engineering Technologies Service (FAO)
AsPIFF	Asian Private Infrastructure Financing Facility
BOO	Build-Operate-Own
BOOT	Build-Operate-Own-Transfer
BOT	Build-Operate-Transfer
BP	British Petroleum
CAA	Civil Aviation Authority (United Kingdom)
CAN	Agricultural Center of the North (Lebanon)
CDC	United Kingdom development institution
CHF	Cooperative Housing Foundation (USAID)
DBO	Design-Build-Operate
DBOT	Design-Build-Operate-Transfer
DCA	Development Credit Authority
DEG	Deutsche Investitions (German Development Finance Institution)
DevCo	Project Development Facility
DFI	Development Finance Institution
DFID	Department for International Development (United Kingdom)
DGIS	Netherlands Ministry of Foreign Affairs
DSCR	Debt Service Cover Ratio
EAIF	Emerging Africa Infrastructure Fund
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEMIP	Facility for Euro-Mediterranean Investment and Partnership
FIAS	Foreign Investment Advisory Service (IFC/WB)
FMO	Netherlands Development Finance Company
G8	Group of Eight industrial nations
GB	Grameen Bank
GDP	Gross Domestic Product
GP	Grameen Phone (Bangladesh)
GPOBA	Global Partnership on Output-Based Aid
GSB	Growing Sustainable Business Initiative
GTO	Gate Toll Operator
HP	Hewlett Packard

HPI	Heifer Project International (United States)
HTFA	High Temperature Forced Air
ICF	Investment Climate Facility for Africa
ICSID	International Centre for Settlement of Investment Disputes
ICT	Information and Communications Technology
IDA	International Development Association (WB)
IDB	Inter-American Development Bank
IF	Investment Facility
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation (WB)
IMF	International Monetary Fund
IMT	Irrigation Management Technology (Nakhlet Irrigation Project, Mauritania)
IMT	Intermediate Means of Transport (VTTP, Tanzania)
InfraCo	Infrastructure Development Company
IPPF	Infrastructure Project Preparation Facility (NEPAD)
IRR	Internal Rate of Return
KIIS	Kalangala Integrated Infrastructure Services Project (Uganda)
KORD	Kakira Outgrowers Rural Development Fund (Uganda)
KSW	Kakira Sugar Works (Uganda)
LAC	Latin America and the Caribbean
LLCR	Loan Life Cover Ratio
MDF	Municipal Development Fund
MDG	Millennium Development Goal
MIGA	Multilateral Investment Guarantee Agency
MIS	Management Information System
MoU	Memorandum of Understanding
MWRI	Ministry of Water Resources and Irrigation (Egypt)
NEPAD	New Partnership for Africa's Development (African Union)
NGO	Non-Governmental Organization
NIIF	NEPAD Infrastructure Investment Facility
NPV	Net Present Value
NWC	Nature's Way Co-operative Limited (Fiji)
OBA	Output-Based Aid
ODI	Overseas Development Institute (United Kingdom)
OECD	Organisation for Economic Co-operation and Development
ORET	Development-Related Export Transactions Programme (The Netherlands)
PCG	Partial Credit Guarantee
PEP	Private Enterprise Partnership for Africa (IFC)
PFI	Private Finance Initiative (United Kingdom)
PFM	Public Finance Management
PIDG	Private Infrastructure Development Group
PMU	Project Management Unit
PPI	Private Participation in Infrastructure
PPIAF	Public-Private Infrastructure Advisory Facility (WB)
PPP	Public-Private Partnership
PRC	People's Republic of China
PRG	Partial Risk Guarantee

PRS	Poverty Reduction Strategy
PSC	Public Sector Comparator
PSP	Private Sector Participation
RMF	Rene Moawad Foundation (Lebanon)
ROE	Return On Equity
SCM	Supply Chain Management
SDFCS	Siongiroi Dairy Farmers Cooperative Society (Kenya)
SDPL	Siongiroi Dairy Plant Limited (Kenya)
SECO	Swiss State Secretariat for Economic Affairs
SIDA	Swedish International Development Cooperation Agency
SPV	Special Purpose Vehicle
TA	Technical Assistance
TAF	Technical Assistance Facility
TASF	Technical Assistance Support Fund
TCFP	Technical Cooperation Funds Programme (EBRD)
UN	United Nations
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USOF	Universal Service Obligation Fund
VCA	Value Chain Analysis
VFM	Value For Money
VPP	Village Pay Phone (Bangladesh)
VTTP	Village Travel and Transportation Programme (Tanzania)
WB	World Bank
WEF	World Economic Forum
WUA	Water User Association
WUC	Water User Council

Glossary

Bond – paper evidence of a legal promise by the issuer to pay an investor on declared terms.

Build-Operate-Own (BOO) – similar to a build-own-(operate)-transfer (see below), with the exception that the project company has a concession life as long as the expected economic life of the facility (typically 30 to 50 years).

Build-Operate-[Own]-Transfer (BO[O]T) – a form of project development in which the government grants a concession of a defined and limited duration to private sector sponsors to build a project, hold an ownership position in it, arrange the balance of financing from third parties and operate the project for the life of the concessions. Usually the concession is shorter than the economic life of the project and ownership transfers to the government at no cost after the concession term.

Co-financing – where different lenders agree to fund under the same documentation and security packages, yet may have different interest rates, repayment profiles and terms. The lenders typically hold different debt tranches.

Concession Agreement – made between a host government and a project company or sponsor to permit the construction, development and operation of a particular project.

Credit spreads – the difference between the yield (interest rate) on the debt securities of a particular corporate or sovereign borrower (or a class of borrowers with a specified credit rating) and the yield of similar maturity Treasury debt securities, i.e. the difference between interest rates on Treasury and non-Treasury debt securities.

Development Finance Institutions (DFIs) – bilateral and multilateral financial institutions whose subscribed capital is owned by sovereign states and whose operating mandate requires the institution to invest in private entities in order to support poverty reduction in the developing world.

Financial viability – the ability of a project to provide acceptable returns to equity holders and to service its debt on time and in full.

Grace period – the period within which a default is resolved without incurring penalty interest or other charges. A period during which interest or principal is not yet payable; it usually occurs after start-up, commissioning and completion in a project financing.

Hedging – a strategy that eliminates a risk through the spot sale of the risk or through a transaction in an instrument that represents an obligation to sell the risk in the future. The goal is to ensure that any profit or loss on the current sale or purchase will be offset by the loss or profit on some future purchase or sale.

Least cost subsidy bidding – a competition, or auction, among private entities to secure the minimum level of state subsidy necessary to deliver a stated level of infrastructure performance.

Limited recourse project financing – a form of project financing in which lenders look mainly to the cash flow of a project to repay debt service but where, under certain conditions (legal or financial), lenders may also have access to the sponsor's credit or legal security for repayment.

Loan tenor – the total repayment period for a loan, expressed as months, quarters or years.

Maturity – the final date a project finance loan is repayable.

Non-recourse project financing – a form of financing in which lenders look solely to the cash flow of a project to repay debt service.

Off-take Agreement – an agreement to purchase all or a substantial part of the product produced by a project, which typically provides the revenue stream for a project financing.

Partial Credit Guarantee (PCG) – an instrument designed to cover private lenders against all risks during a specified period of the financing term of debt for a public investment. These guarantees are designed to extend maturities and improve commercial terms (e.g. lower spreads).

Partial Risk Guarantee (PRG) – an instrument designed to cover private lenders against the risk that a government or a government-owned agency fails to perform its contractual obligations *vis-à-vis* a private project.

Private Finance Initiative (PFI) – allows the public sector to contract with the private sector to provide quality services on a long-term basis, typically 25–30 years, so as to take advantage of private sector infrastructure delivery and service management skills, and the incentive of having private finance at risk.

Public-Private Partnership (PPP) – participation by the private sector (the for-profit or not-for-profit sectors) in the provision of infrastructure services in cases where, if left to the free market alone, such private participation would not occur because of the low returns on investment or the levels of risk involved, financial or non-financial.

Shadow tolls – tolls based on project use but payable by the government or other contracting authority rather than the general public.

Shadow user fee – a fee paid by the state to a private operator against some level of use of the infrastructure, either against actual demand (less predictable) or against some agreed assumptions in the level of demand (more predictable).

Sovereign Guarantee – a government guarantee of its obligations under project documents.

Special Purpose Vehicle (SPV) – an entity established for a particular purpose, such as obtaining off-balance sheet financing, gaining tax advantages, or isolating the sponsors' other assets from the project's creditors.

Universal Service Obligation Fund (USOF) – a state-sponsored fund, or a fund sponsored by private parties under state regulation, used to subsidize investments by the private sector in infrastructure that without these subsidies would not be accessible to all.

Value chain analysis (VCA) – analysis of the competitiveness of a firm or an industry across the range of production and informational activities that lead a product or service from conception, through intermediary phases of production, processing and delivery to final consumers. VCA requires two principal, and interlinked, investigations: (i) assessment of market demand and (ii) investigation of supply-side constraints, the latter can be broad or narrow, e.g. limited to infrastructure constraints.

Executive summary

A major, if not *the* major, component of competitiveness in agricultural value chains is access to affordable physical infrastructure. This includes infrastructure that supports on-farm production (irrigation, energy, transportation, pre- and post-harvest storage), ensures efficient trading and exchange (telecommunications, covered markets), adds value to the domestic economy (agroprocessing and packaging facilities), and enables produce to move rapidly and efficiently from farmgate to processing facilities, and on to wholesalers (transportation and bulk storage). In a recent study on agricultural investment in Africa by the United Kingdom Department for International Development (DFID), poor access to infrastructure services was cited as “the greatest impediment to growth of agribusinesses”.

Low population densities, remote locations and weather-dependent production systems make participation by the private sector in agricultural infrastructure highly risky. An analysis of the World Bank’s (WB) comprehensive database on Private Participation in Infrastructure (PPI) in developing countries attributes just one percent of total infrastructure investment value directly to the development of agriculture between 2003 and 2005. The persistent challenge seems to be to know when and where public-private partnerships (PPPs) are a value-adding proposition for infrastructure in market-oriented agricultural development, and how best to formulate the financial and institutional arrangements for such collaboration.

The lesson to date is that collaborative approaches will not work in all cases, and that “a PPP can never turn a poor investment into a good one.” However, with a renewed commitment of governments and donors to investment in rural infrastructure, and an emerging bull market for global trade in cereals, horticulture, meat and milk products – as well as experimentation with new forms of infrastructure financing and contracting – there are real opportunities to broaden the role of the private sector in infrastructure for agricultural development through PPP models.

BUILDING BLOCKS OF PUBLIC-PRIVATE PARTNERSHIPS IN INFRASTRUCTURE FOR AGRICULTURAL DEVELOPMENT

Section 3 of the report takes a look at the main variables – the building blocks – involved in developing and managing PPPs in the context of infrastructure for agricultural development. These include efficient strategic planning, an attractive proposition for the private sector and the right regulatory framework.

EFFECTIVE STRATEGIC PLANNING

Planning the role for public-private collaboration in the construction, operation or maintenance of infrastructure for agricultural production needs to move beyond focusing only on questions

of commercial finance and risk transfer. It needs to look also at the likelihood that such arrangements will deliver improved outcomes aligned with both the government's intended growth strategy for the agricultural sector – be that improved productivity, greater crop or livestock diversity, technology transfer or employment generation – and the intended market, be that local, urban or export. To this end better use could be made of Value Chain Analysis (VCA). This method of analysis can be applied to prioritize infrastructure with respect to different locations, technologies, scale, sequencing, coordination, etc. – and to identify the best fit for the private sector in infrastructure financing, construction, operation and/or maintenance.

ATTRACTING THE PRIVATE SECTOR

Public subsidies are increasingly relevant to achieving commercial viability and attracting the private sector into high risk infrastructure. Infrastructure in remote rural regions, and dependent on agricultural production to recover capital and operational costs (irrigation, wholesale markets, etc.) is rarely “bankable” without financial support. Without subsidy, when financing is adjusted for risks, projects cannot service the resulting credit terms and generally fail to command a competitive return for investors. It therefore seems likely that in this sector the allocation of subsidies by the state will continue to grow. Subsidies include: grants, concessional loans (sourced, for example, from the International Development Association [IDA] of the WB) and various guarantees. Such subsidies can be supported from public investment budgets, the profits of urban-based concession agreements (e.g. cross-subsidy in the telecommunications sector) or provided by donors. A recent example of the latter is multidonor facility: Global Partnership on Output-Based Aid (GPOBA), which provides performance-based grant subsidies.

An advantage of capital grants or shadow tariffs over the provision of large-scale concessional loans, or credit/demand risk guarantees, is that the private party remains exposed to a higher degree of commercial credit risk. Arguably, the former instruments of risk transfer incentivize the private party to maintain a strong focus on cost efficiencies and performance. Too much risk transfer, however, such as providing only highly targeted and short duration partial shadow tariffs, and the private sector will not be attracted to the PPP proposition in the first place. Conversely, too little risk transfer, such as fully guaranteeing demand risk, and the often high costs and inefficiencies in public sector provision of agricultural infrastructure provision may simply be perpetuated by the private operator.

Experience to date suggests that when financing agricultural infrastructure PPPs in cases where full cost recovery cannot be commanded, it is important to use subsidies to position projects as “close to market” as possible. This improves the project's appeal to investors and strengthens the possibilities for commercially financed expansion. Capital and consumption-based public subsidies, along with credit risk and demand risk guarantees, can be designed to ensure that a project remains financially viable.

The main part of this report provides a checklist for decision-makers to help them explore whether a proposed strategic public intervention in agricultural infrastructure might be attractive to some type of private sector participation (PSP) (see Section 2.3.5). This includes questioning:

- what the source of revenue will be (user fees, subsidies, purchase agreement, etc.) and whether this will be sufficient to cover investment costs and return a profit;
- whether the commercial scale of the opportunity will warrant the high sunk costs involved in project development, including competitive bidding by private parties;
- whether the proposed infrastructure offers growth potential for the private party, for example, is located in a rapidly developing agricultural area, or offers potential for design innovations, operational changes or expansion to raise revenues over time.

To aid the comparison between financing options in designing PPPs and attracting the private sector to participate in agricultural infrastructure, the report presents seven PPP financing scenarios. For illustrative purposes two of these are shown below (see Section 3.2).

Figure A Capital and shadow user fee subsidy, (e.g. road infrastructure)

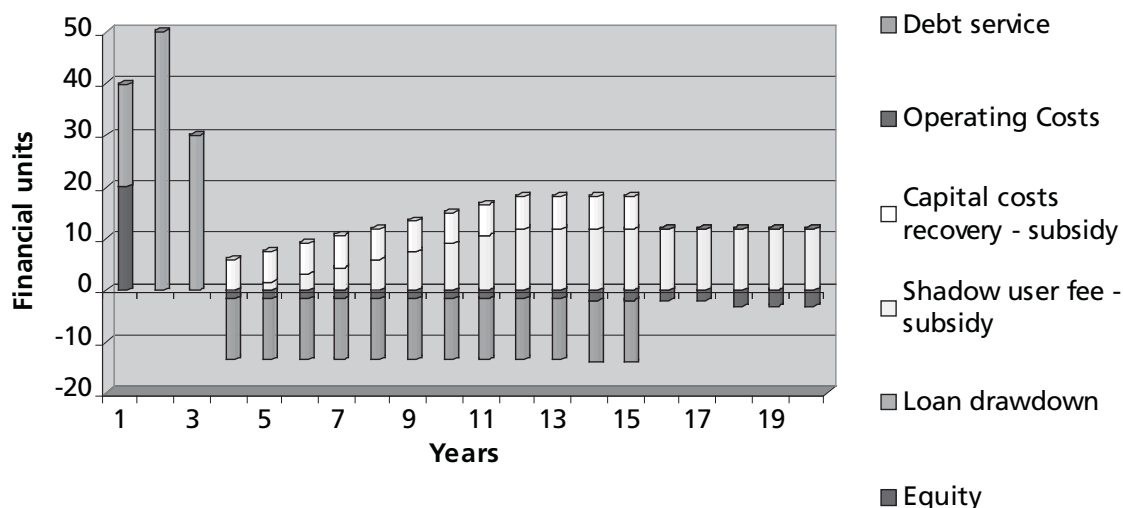
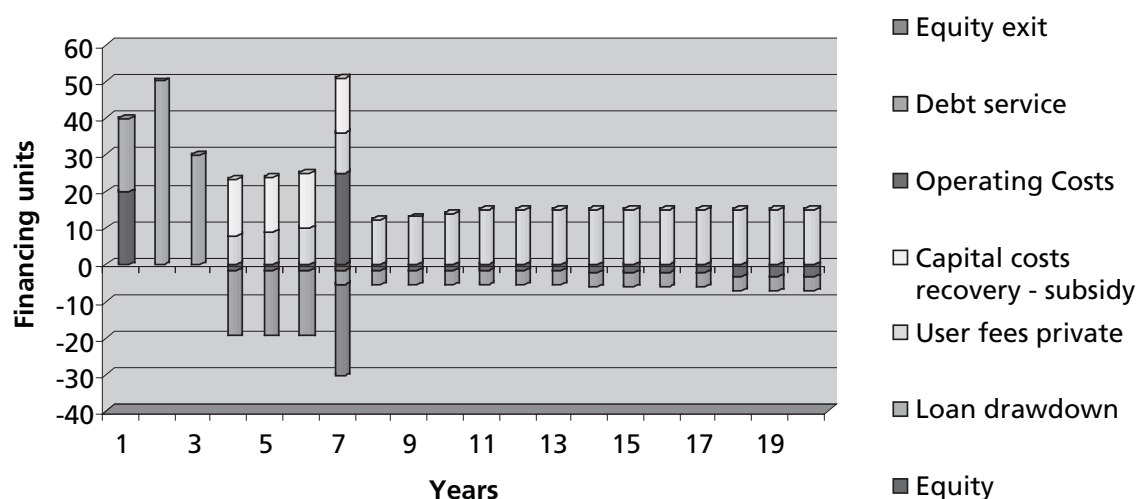


Figure B Refinancing following construction, (e.g. irrigation works)



THE RIGHT REGULATORY FRAMEWORK

Most government-funded infrastructure is a “public good” in that it seeks to be non-exclusionary. However, with its focus on agriculture, the types of infrastructure investigated in this report invariably target a discrete sub-subsection of the population: producers, traders and processors. Introducing private sector finance into this provision may further restrict the range of beneficiaries, with the service accessible only to that portion of the agricultural value chain able to pay user fees or tariffs sufficient to service the debt of the private party. To counter these exclusionary pressures it is essential that PPPs operate within a suitable regulatory framework so that the wider public interest is protected. This could be through performance-based contracts that carry a universal, or nearly universal, service obligation.

Important regulatory considerations include:

- whether there is need for an independent regulator; for example, if state-owned companies (such as in telecommunications) are effectively competing with private operators, as is the case in parts of India;
- protecting customers against monopolistic abuse, while ensuring the commercial viability of investments and profits for the private sector sufficient to support further network expansion;
- institutional capability to manage open bidding and evaluation procedures, and to undertake comparisons of private sector performance data over time.

Because infrastructure for agricultural development is likely to be, in part, exclusionary (more so for irrigation, trading centres and agroprocessing facilities, less so for roads or for telecommunications under a universal service obligation), the politics of PSP may run counter to conventional wisdom. The current uneasiness regarding PSP in infrastructure not only arises from the issue of private companies benefiting from public service financing but it also surrounds whether the public sector should be subsidizing essentially private sector ventures that are targeted at minority public interests, which include agricultural producers, traders and processors. The tests here are threefold: (i) does the proposed infrastructure deliver on some broader public interest, for example increased trade, technology transfer, employment opportunities or social development goals, such as food security; (ii) would the infrastructure project take place without participation of the private sector; and (iii) does involvement of the private sector bring better “value for money” (VFM) compared with solely public sector provision?

PUBLIC-PRIVATE PARTNERSHIP MODELS AND VARIANTS

The report analyses a range of PPP models and model-variants that promote market-oriented agricultural development. The models are informed by case studies commissioned for the report. Highlights are given below.

Farm to market roads

Low income levels and low vehicle volumes mean that in many rural areas neither road construction, rehabilitation nor routine maintenance can be financed from user fees or tolls alone. Here subsidies are essential. At present the private sector remains principally attracted to urban and intercity projects, where traffic volumes are high and reliable.

One exception is where a rural processing facility and its outgrowers are prepared to combine resources to support road development. Such a model is illustrated by the Kakira Outgrowers Rural Development Fund (KORD), Uganda (see Section 4.2.1). At the centre of this model is a not-for-profit infrastructure financing and maintenance services management company. This company receives capital grants from donors and the processing facility, together with a levy on outgrowers' sales to the same facility. A success key factor is the ability of the company to raise additional funds to meet recurrent asset maintenance costs, for example, by offering services such as microcredit.

Involvement of private road users in designing and helping to maintain the “first 10 miles” of a transportation network from the farmgate is a key to agricultural growth in many rainfed areas. If participating communities are involved in asset ownership or are signatories to concessions, and if they receive income from district authorities to support their direct involvement in asset maintenance, these measures might increase the sustainability of microroad and track PPP infrastructure projects in the long term. Progress towards such a model is illustrated by the Morogoro Village Travel and Transportation Programme (VTTP) in Tanzania (see Section 4.1.1).

An alternative approach is to bundle together interlocking productive agricultural infrastructure, with roads as only part of the investment. This carries possibilities for improving the commercial attractiveness – the bankability – of the project. The Kalangala Integrated Infrastructure Programme in Uganda is a case in point. This project brings together infrastructure for roads, ferry operations, power and water supply. Infrastructure “bundling” not only enables a PPP project to reach a size that renders it of interest to both equity investors and commercial lenders but it also offers multiple sources of revenue that help mitigate volatility in demand risk and (in some cases) generates tax revenues that can be recycled to support construction and maintenance, e.g. through shadow tolls. It is serendipitous that the financial advantages of bundling infrastructure together aligns with the need to address infrastructure coordination failure, i.e. to overcome the multiple, interlocking constraints in infrastructure provision along agricultural supply chains.

The task of identifying and developing individual infrastructure projects in low income areas can be a complicated and protracted process and represents a high risk for those investing capital. Attempting the same for the type of integrated infrastructure programme noted above is even more risky. The role played by InfraCo (part of the Private Infrastructure Development Group [PIDG] multidonor family of infrastructure facilities) as a dedicated project development company has been pivotal to progress with this project to date.

The United Kingdom Private Finance Initiative (PFI) approach to road construction and maintenance is of interest here. The model ensures that government service payments for

maintenance commence “in parallel” with capital works, thereby releasing a revenue stream early and thus providing the private entity with a cash flow to service debt and pay overheads. This variant works best where one part of the road network under the project requires rehabilitation or construction and another part requires only maintenance. In translating the model to a low-income developing country context, a major obstacle would be in securing guarantees against default by subsovereign authorities on commitments to make periodic service charge payments to private entities.

With respect to civil road construction and rehabilitation work, a possible limiting factor for project sustainability is the lack of experience of local contractors in the construction of assets (especially those with significant mechanical engineering content). Another factor might be shortfalls in the capacity of such companies to provide sufficient performance bonding to secure against non-delivery.

Water for irrigation

The vicious circle of inadequate irrigation operations and maintenance can be broken by positioning third parties between farmers and the public entity, with the aim of professionalizing irrigation asset management, operations and maintenance functions. This third party could be a financially autonomous government agency, a professionalized water user association (WUA) or a private company. The motivations for this for the public sector include:

- reducing local authority recurrent expenditure;
- improving water management and fee collection;
- reducing social conflicts;
- enhancing the productivity and returns on investments for farmers.

One such PPP project is the Nakhlet Small-Scale Irrigation Scheme in Mauritania, designed to pump water from a tributary of the Senegal River. The project achieved a reported internal rate of return (IRR) to farmers per season of 103 percent (see Section 5.1.1). Such a model depends on farmers contributing both a fixed charge (as an annual subscription) to service the WUA’s debt and variable user fee payments for agricultural inputs, irrigation service, equipment maintenance and share of depreciation of the irrigation equipment.

Growth predictions in the use of infrastructure are a central part of the capital financing of projects on a non-recourse or limited-recourse basis. For irrigation projects, these predications can be highly uncertain. One advantage of the above Nakhlet deduced model is that financing is primarily on a seasonal basis, with support limited to operations and maintenance only.

The PPP model described in Section 5.2 is drawn from the WB-funded Nile West Delta large-scale irrigation programme. This project highlights the stark choice of public sector concession planners between whether a government should provide grant subsidies *or* take on the principal credit risk. In this case the project demonstrates the latter, i.e. how irrigation projects might be financed without granting capital or consumption-based subsidies to the private sector. The key is to (i) adopt a demand-driven approach to planning, where the growers’ willingness to pay for connection guides the technical design options and commensurate tariffs; and (ii) to maintain the principal credit risk with the public sector, thus facilitating concessional

donor finance and avoiding costly and complex third-party credit guarantees for borrowings by private parties at commercial rates.

Finally, given the risk of social conflict inherent in irrigation schemes, there is potential benefit to be gained by including WUAs and community non-governmental organizations (NGOs) more formally in PPP irrigation structures. An example might be affording them the right to consultation on the operator's final design and representation in the regulatory authority.

Wholesale markets and trading centres

Across the developing world, the establishment of regulated trading centres has been lopsided. Some provinces invest in these facilities; in others, establishment has been "quite inadequate". In India, for example, more progressive states have amended their regulatory framework to enable participation of the private sector and cooperatives in wholesale markets. The same amendments allow for financial assistance and subsidies to be made to private companies and corporate bodies involved in these activities (see Section 6.1).

User demand associated with wholesale markets and other types of trading centres is a heightened risk. This highlights the importance of regulatory authorities retaining the option of allowing concession holders to develop land for on-leasing or sale, for example, through appropriate land use rezoning (as adopted in the WB supported Gdansk fruit and vegetable wholesale market in Poland). Such alternative income streams reduce the need for state subsidies, improve commercial credit terms and can significantly raise the attraction of the project to private equity investors, as illustrated by the Gdansk Wholesale Market in Poland for trading fruit and vegetables (see Section 6.1.1).

Agroprocessing

Agroprocessing facilities are often viewed as essentially business-to-business private operations. It is therefore unlikely that the raising of debt for investment in agroprocessing PPP projects, and/or the high risks of debt repayment, could be transferred to a public body. The public sector is more likely to contribute in the form of land through concessions, or provide capital grants (perhaps backed by donors). The expectation is that farmers and/or private interests will assume the main commercial risks.

Situations where farmers are able to raise their own capital to finance new or expanded agroprocessing infrastructure are limited to all but the most commercial of farms. This constraint is compounded where the proposed facility depends on a single commodity and is grown by small-scale farmers carrying high levels of production risk (such as the Siongiroi Dairy Plant project described in Section 7.1.1). As noted, capital subsidies from the state in the form of land or grants and concessional donor finance are part of the solution. Another is capital from a second, established, for-profit or not-for-profit private third party, complementing farmers' paid-in capital.

A different model is illustrated by the heat treatment facility for fruit in Fiji. This is a PPP between an owner-operator (Natures Way Co-operative Limited [NWC] [Fiji]), the Fiji

Ministry of Agricultural, the United Kingdom Civil Aviation Authority (CAA) and the United States Agency for International Development (USAID). In this case, USAID provided grant funds to purchase the treatment chamber and ancillary equipment, and the ministry a capital grant to fund the physical structures. The CAA granted land for the facility. The arrangement means that the facility started operations debt-free and thus better able to manage supply risks and raise capital for expansion. The model also involves both growers and exporters as equity partners in the agroprocessing facility project. This ensures that the facility is developing in a way that aligns with market needs and supplier capabilities.

As both the Siongiroi Dairy Plant in Kenya and the fruit fly treatment facility in Fiji illustrate, financing agroprocessing facilities is risky. The less diversified the range of services on offer, and the greater the dependency on single commodities and on rain-fed farming systems, the higher the risks. Broadening infrastructure services, to include not only specialized agroprocessing but also wholesale trading and marketing, is likely to reduce the volatility of user fees. It is also likely to make the venture more attractive to potential funders and investors, as illustrated by the North Lebanon Agriculture Center example discussed in Section 7.3.1.

Information and communications technology (ICT)

One recent estimate puts global cellular communications coverage by 2010 at 80 percent of the world's population. In 2006 there were already 2.67 billion current cellular subscribers, up from 640 million in 2000 (a rise of 417 percent in six years). Thus, circumstances are changing fast, with mobile coverage already fairly comprehensive on a global scale, and the need for state subsidies declining. Key challenges that remain in which PPPs might play a significant role include: (i) how to finance physical telecoms infrastructure (relay stations, base-stations and broadband) in remote rural areas, as opposed to mobile networks, which require little subsidy; and (ii) how to utilize ICT infrastructure in value chains to stimulate growth of smallholder agriculture. The first of these challenges is answered in part through the process of least-cost subsidy auctions described in Box 3.6.

The DrumNet project in Kenya (see Section 8.1.1) shows how public and private parties can collaborate to use information technology to create the elements of a “virtual” outgrowers programme. Farmers coordinate to achieve the volumes necessary for agroprocessors; to access affordable credit; to secure extension services to meet quality standards; to access prespecified agricultural inputs; and to derive secure purchasing agreements. Central to this PPP model is an ICT-driven Supply Chain Management (SCM) system, which links information about the standards required by major purchasers to producer groups and suppliers of agricultural inputs, as well as data on credit flows, transactions and accounting.

The organization for this model is complex, but essentially involves concessional public funding to purchase ICT equipment, customize the SCM ICT platform and cover staff overheads. A third-party implementing agent (for-profit or not-for-profit entity) manages the operation, drawing on income from farmer membership fees, credit spreads (shared with bank), credit risk guarantee fees and brokerage fees for securing long-term contracts with purchasers.

The SCM ICT platform enables transactions in the supply chain to be cashless, with costs deducted directly from the same bank account into which purchasers make payments and the bank provides credit. This brings a number of benefits: Farmers are more willing to pay insurance against failing to meet purchase agreement obligations. Deductions of interest and principal payments are made directly from product sales, reducing the risk of farmers' defaulting on debt repayments. Moreover, payments for inputs to suppliers are immediate.

CONCLUSIONS

Some of the models and illustrations in this report are essentially donor grant-funded projects, with the private sector (for-profit or not-for-profit) carrying little commercial risk beyond working capital (for example the Morogoro VTTP in Tanzania). Others are almost entirely privately financed projects (KORD for road maintenance in Uganda), with virtually all commercial and political risks transferred to the private entity via a complex arrangement of equity, debt and guarantee instruments.

Knowing which financing/subsidy model will work best is in part about applying the three tests raised earlier concerning source of revenues, commercial scale and growth potential. It is also about selecting the right contractual arrangement to execute the project. Concession arrangements offer incentives to the private sector to invest in agricultural infrastructure in the long term. However, the nature of agricultural production, with its inherent physical risks, volatile commodity markets and dependence on downstream infrastructure coordination, suggests that concession agreements are but a partial answer.

Other ways need to be found to enable private parties to manage the main commercial risks, in particular demand risk. The strategy of "bundling" infrastructure adopted in the Kalangala integrated infrastructure programme in Uganda is one option. Another, as illustrated by the Gdansk Wholesale Market project, is to broaden the terms of concession agreements to allow the raising of indirect revenues from land development and on-leasing. In both cases care needs to be taken with these contractual arrangements so as not to contribute to criticism that private control or concessional development of public services and state land is exploitative of publicly owned assets.

Finally, there is the question of public subsidies. We are currently seeing pledges of new aid for infrastructure from donors. Further, fiscal surpluses from trade and oil, gas and mining revenues are accruing for a growing number of developing countries in Africa, the Near East and Asia, and may act as a new source of aid. There are also record levels of liquidity residing in multilateral and bilateral development finance institutions, resulting in shareholder pressure on these institutions to invest more in frontier regions and sectors. Under these conditions, the opportunities to use public subsidies to attract private involvement into riskier and less profitable agricultural infrastructure have rarely been greater. Further, if those anticipating a sustained bull market in agricultural commodities are proven right, then the long-term prospects for recovering financial investments in infrastructure are comparatively buoyant.

The task for FAO is to take these trends into account and consider how best to support public institutions in attracting private parties to help bridge the infrastructure deficit in

agricultural supply chains. The key will be to work directly with ministries of agriculture, aiding their strategic infrastructure planning, and enabling them to interface with ministries of finance, ministries of economic planning and ministries of trade and industry. In this way public investment budgets and regulatory reforms can be directed towards optimizing the role of the private sector in infrastructure delivery.

1. Introduction

1.1 PURPOSE

The Rural Infrastructure and Agro-industries (AGS) Division of FAO, under its normative programme on Rural Infrastructure Development, has embarked on a comparative appraisal of models of PPP in rural infrastructure development. This report is part of that process. Specifically, the report contributes to the identification of discrete PPP models, and model variants, for different categories of market-oriented infrastructure for agricultural development.

In this report, we define infrastructure as physical structures that aid the competitiveness of the productive agricultural sector, and the related organizational systems that support their planning, procurement, design, construction, regulation, operation and maintenance. This marks a departure from recent studies on the general topic of “rural infrastructure”¹, which tend to be wider in scope and cover not only productive investments for agricultural development, but also consumptive investments in public health services, basic education and residential water supplies and sanitation².

FAO has elected that this report should look at five types of infrastructure categories: (i) farm to market roads; (ii) water for irrigation; (iii) wholesale markets and trading centres; (iv) agroprocessing facilities; and (v) information and communications technology. A decision was taken by AGS during the study not to formally investigate rural energy, although clear linkages are acknowledged between energy and other infrastructure sectors, e.g. irrigation and agroprocessing.

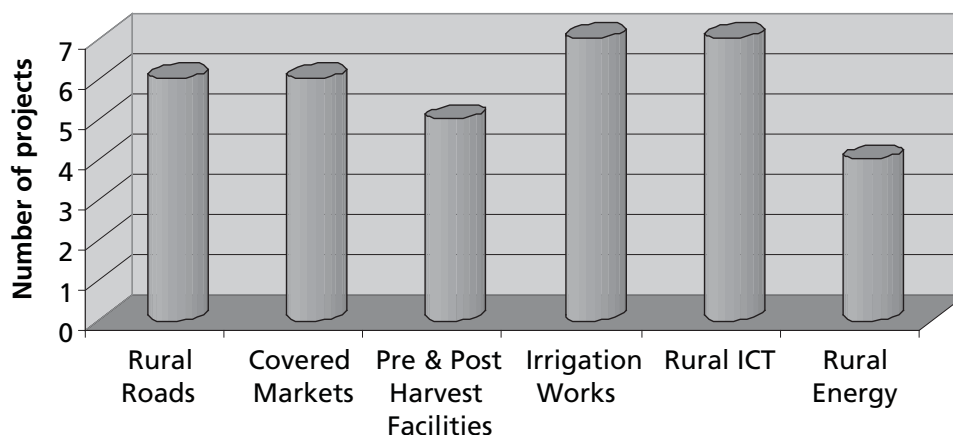
Although not public service infrastructure in the conventional sense, agroprocessing facilities have been included in the study because of the importance they play in overcoming coordination failure in agricultural value chains. Further, although they more commonly are private commercial ventures, in many economically disadvantaged regions, such facilities would not exist if this were left to the free market alone.

The report considers both “hard” infrastructure, i.e. physical structures, and “soft” infrastructure: strategic planning, contractual and pricing arrangements, and the human and institutional systems and support mechanisms necessary to operate and maintain the physical infrastructure.

1.2 APPROACH

This report draws on the analysis of a survey of 35 PPP projects for rural infrastructure, as indicated in Figure 1.1.

Figure 1.1 Breakdown of PPP survey by infrastructure type



Survey questions were devised as multiple choice, divided into four types:

- *General questions:* type of infrastructure, location, green or brownfield, capital expenditure, operational expenditure, duration of PPP agreement;
- *Development outputs and outcomes:* key beneficiaries, on- and off-farm employment generation, increased agricultural production and farmgate prices; potential for replicability and taking to scale;
- *PPP arrangement:* legal and contractual status; method of procurement; source of finance and means of cost recovery; division of roles; key risks; performance incentives; return on investment;
- *Enabling environment:* status of good governance in country; political will and public support.

The questions posed in the survey are given in Annex A. The sample size, and the ad hoc nature of their selection, does not allow for statistical analysis. However, the survey does indicate the broad landscape of PPPs for market-oriented agricultural development, and certain inferences can be drawn from the results. These have been used to help prepare Section 3 of the report, on the building blocks of PPPs for agriculture-oriented infrastructure, and to inform the lessons learned from the more detailed case studies.

The survey aided identification of certain PPP projects that warranted further investigation, either because they represented a highly effective or innovative model, or because they illuminated one or more particular aspects of a PPP configuration relevant to the study, such as financing structure, institutional support and risk transfer. In total, 18 case studies were commissioned. The criteria used to identify these cases are given in Annex B, and an overview of the attributes of each case in Annex C.

1.3 STRUCTURE OF THE REPORT

Section 2 provides background on the rising demand for new investment in rural infrastructure and highlights some of the failures to date in engaging the private sector successfully in its provision. Section 3 summarizes the key financial and institutional “building blocks” of PPPs in the context of rural infrastructure for market-oriented agricultural development. In Sections 4 to 8, a suite of models for PPPs is presented and analysed for their success factors, innovations and weaknesses. These are drawn largely from the case studies commissioned for this study. A checklist for decision-makers is provided in Box 2.2, providing some “rules of thumb” in considering PSP in infrastructure for market-oriented agricultural development. This final section also brings together areas for further research and follow up that might be of strategic interest to FAO.

2. Background

This section provides an overview of the case for increased investment in physical rural infrastructure aimed at promoting market-oriented agricultural development, along with some of the failings to date in engaging the private sector in this provision. The definitions of PPPs used in the report are briefly discussed.

2.1 THE CASE FOR INFRASTRUCTURE

The WB has indicated that over the past 15 years there has been general underinvestment in infrastructure in many developing countries by both the public and private sectors, in particular in the rural areas.

Infrastructure investment needed to keep up with projected growth in the developing world is estimated as equivalent to an average 5.5 percent of combined gross domestic product (GDP). Currently the public sector accounts for three-quarters of all infrastructure investments, but is investing at a rate of only 2 to 4 percent of GDP. Investment in infrastructure is generally higher in East Asia, moderate across Africa as a whole, and low in Latin America, at 2 to 3 percent³. The situation in sub-Saharan Africa is particularly poor:

African governments and development partners sharply reduced, over the 1990s, the share of resources allocated to infrastructure – reflecting its lower priority in policy discussions. In retrospect, this was a serious policy mistake, driven by the international community, which undermined growth prospects and generated a substantial backlog of investment – a backlog that will take strong action, over an extended period, to overcome. This was a policy mistake founded in a new dogma of the 1980s and 1990s asserting that infrastructure would now be financed by the private sector. Throughout the developing world, and particularly in Africa, the private sector is unlikely to finance more than a quarter of the major infrastructure investment needs⁴.

This decline in PSP in infrastructure investment followed an earlier rise from 1992 to 1997 (Figure 2.1).

Figure 2.1 Private infrastructure investments in developing countries and emerging economies 1990–2005 (investments per year in US\$ million)⁵

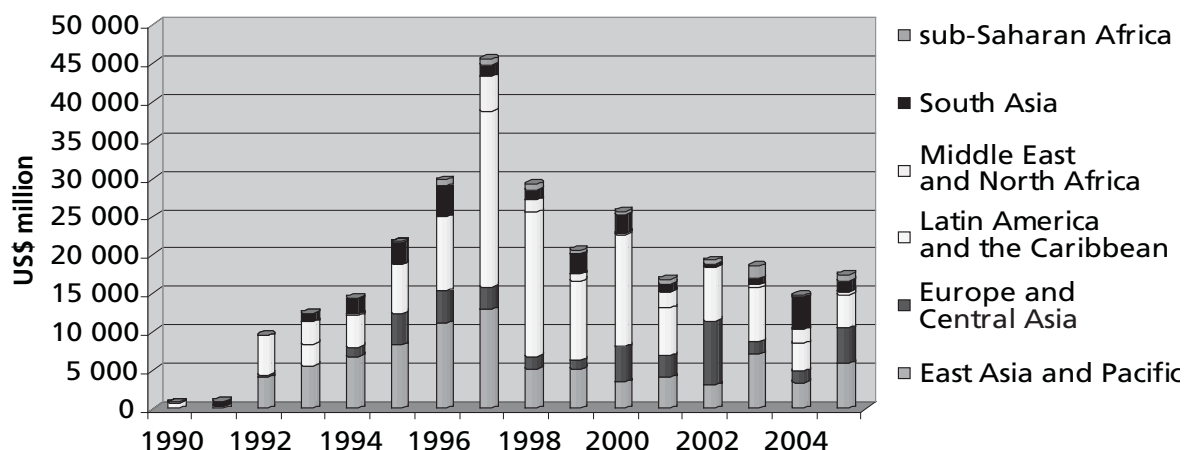
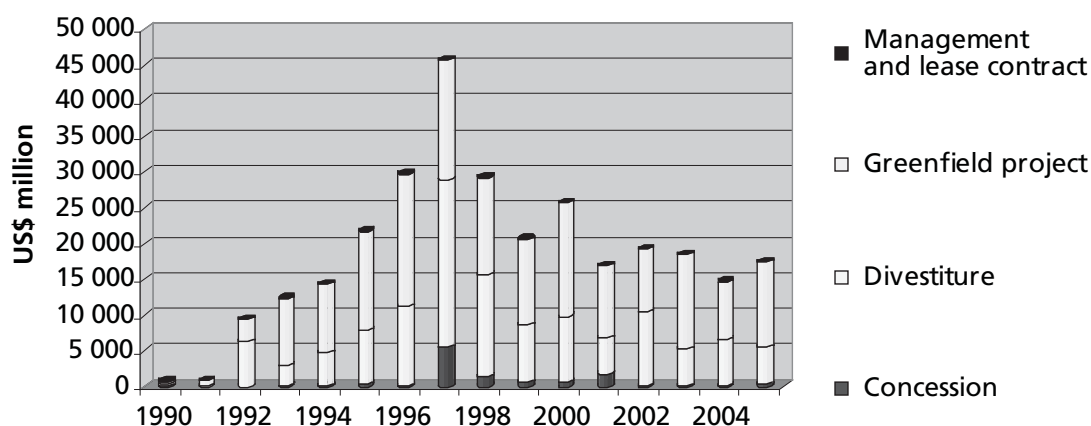


Figure 2.2 Private infrastructure investments in developing countries and emerging economies by type of participation 1990–2005 (investments per year in US\$ million)⁶



2.2 INFRASTRUCTURE AND AGRICULTURAL DEVELOPMENT

A range of general and infrastructure specific constraints act against the productivity and competitiveness of agriculture in developing countries.

2.2.1 General constraints on agricultural growth

Constraints on growth in agriculture in developing nations are many and are different for different producers and different markets. In very broad terms, for commercial farmers the main constraints include lack of suitable and sufficient land, too few good managers, unaffordable long-term debt and working capital, high costs in meeting the standards of

international markets, and a lack of, or overly costly, infrastructure for handling either bulk (e.g. for export commodities) or perishable, high-value produce. For agribusiness processors, key constraints include a lack of reliable, high-quality supply from smallholder farmers. For smaller farmers, constraints include: a lack of irrigation infrastructure to remove the volatility associated with rainfed farming systems and increase yields and cropping seasons; prohibitively expensive credit and a lack of collateral; poor supply chain and market information; and a loss of profit margins to middlemen and traders owing to a lack of transport or market trading and exchange centres.

2.2.2 Infrastructure constraints in agricultural development

A major, if not the major, component of competitiveness in agricultural value chains is the cost of infrastructure to support on-farm production, to facilitate efficient trading and exchange, to add value through processing and to transport produce from farmgate to processing facility and on to wholesalers. In one recent study on agricultural investment in Africa by the DFID, “poor access to infrastructure services was cited as the greatest impediment to growth of agribusinesses”⁷.

Focusing on the delivery side alone, significant improvements in producer incomes can be achieved without increasing farm productivity if post-harvest storage, trading and transportation costs can be reduced. For example, in many parts of sub-Saharan Africa, and in the more remote rural areas in Southeast Asia and Latin America, poor rural roads fail to connect smallholders efficiently to local markets or agribusiness processors. Roads that are impassable in the wet season, for example, force farmers to sell their produce in the dry season at low prices. This in turn leads to higher prices in the wet season from which small farmers cannot benefit. The quality of roads also plays a part. International markets and some urban markets increasingly require the movement of produce by bulk or refrigeration. Poorly constructed or maintained roads prohibit use by these larger vehicles, therefore constraining market access. Port, airport and other freight shipping capacity are not part of this study, but the same constraints apply.

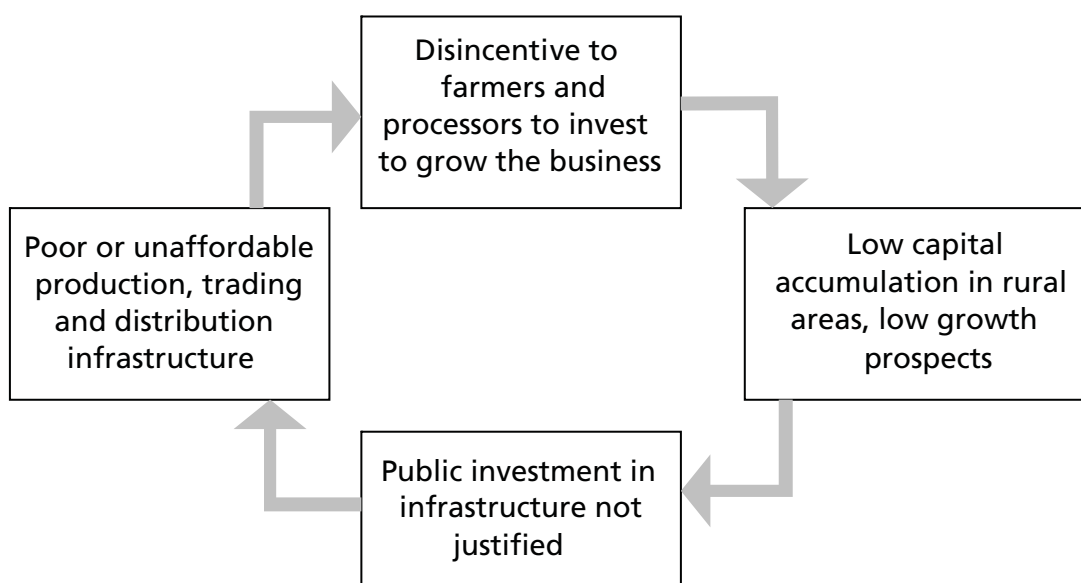
The lack of post-harvest storage facilities for producers (cold storage, grain silos, etc.) is also a significant constraint on agricultural development⁸. So too are a lack of market exchanges and auction centres to improve margins for farmers and farmer cooperatives and to bring economies of scale to the provision of seeds, fertilizers and other agricultural inputs. Sufficient agroprocessing capacity able to supply products at the quality, volume and reliability demanded by wholesalers and end-user markets is a further limitation.

Low levels of investment in irrigation are a major constraint for rainfed farming systems. The capital investment required of producers to construct irrigation works, and the long payback period, is prohibitive for many farmers and farmer cooperatives working alone. Further, the commercial viability of such investment decisions depends often on the future expansion of production by farmers, and this in turn may be constrained by other factors, such as land availability, cost or reliability of inputs and other aspects of infrastructure provision, such as road quality and transportation costs. This brings into question the coordination and sequencing of infrastructure: for example the importance of reliable and affordable electricity to support investments in lift irrigation or agroprocessing and cold storage, and the need to

upgrade rural roads if investing in agroprocessing facilities that rely on regular deliveries of raw materials from outgrowers.

Figure 2.3 shows the vicious circle that operates where absent, poor or costly infrastructure limits on-farm productivity, agroprocessing and market access. This in turn acts as a disincentive to private investment to achieve higher productivity. Productivity and growth prospects are thus insufficient to justify public investments in more affordable and relevant infrastructure services.

Figure 2.3 Poor infrastructure and low agricultural development: a vicious circle⁹



2.3 PRIVATE SECTOR PARTICIPATION IN AGRICULTURE-ORIENTED INFRASTRUCTURE

A key question is: can the private sector play a role in breaking this cycle, either increasing the quality and/or lowering the cost of existing market-oriented infrastructure, or bringing investment to rehabilitate or construct new infrastructure that then promotes private investment by agricultural producers and processors alike? If the private sector “can” help break the cycle, then what role is there for the public sector in realizing this participation?

2.3.1 Weaknesses in public sector infrastructure provision

The state is frequently faced with particular constraints in designing, financing, constructing or maintaining infrastructure directed at the agricultural sector. These include, *inter alia*:

- overburdened public financial resources, with insufficient funds to support the large, upfront, capital investments needed for infrastructure, and competing demands from rising recurrent expenditures from more powerful ministries and seemingly more urgent development priorities, such as education and health;

- in low-income economies, a pattern of medium-term (one to three-year) commitments from international development agencies to fund public investment budgets, rather than the longer-term commitments to subsidies (e.g. shadow tariffs) and recurrent expenditure needed to support high risk, low return, infrastructure;
- in emerging economies more generally, public investment policies that bias productive investments to urban areas and the faster growing manufacturing and services sectors, with the assumption that trends in industrialization and rural-to-urban migration are reducing the relative economic value of public investment in rural infrastructure;
- low administrative efficiency of public service departments or state-owned utility companies, leading to poorly planned, designed and financed capital infrastructure projects, poor cost recovery rates, and inadequate maintenance;
- user tariffs set too low to cover operational costs or payback capital investments, for either political reasons or reasons to do with inaccurate assessments of risk;
- mismanagement and corruption, especially in the process of procurement of infrastructure engineering, construction and maintenance services;
- an underdeveloped domestic engineering sector, unable to implement public works infrastructure projects to a sufficiently high specification, or to the necessary source skills, equipment and materials.

2.3.2 Benefits of private sector participation (PSP)

Though by no means a panacea, the potential benefits of PSP in infrastructure for agricultural development are many. Some of the more celebrated are discussed briefly below¹⁰.

Respective strengths

PPPs are a means to bring the best features of the public and private sector together. The private sector can leverage its advantages in creative financing, greater operational efficiency, lower costs of distribution, more complex delivery systems, faster decision-making, management flexibility and innovation. The public sector can provide strategic direction – the choice, location and pricing of infrastructure; ensure VFM and transparency in procurement; and, above all, through capital or user fee subsidies, or commitments to purchasing agreements, enable “private firms to enter large markets with guaranteed consumers”¹¹.

Responsiveness to local need

In general, agriculture infrastructure models are in a period of transition, away from centrally controlled public sector provision, which can be inefficient and far removed from the real needs of end users, to more private sector, demand-driven and decentralized models. If the performance incentives for PSP are structured correctly (universal service obligations for mobile phone network coverage, vehicle usage performance specifications for road rehabilitation, etc.), the private sector may well be more responsive. Infrastructure can have a greater reach (e.g. more downstream farmers are served with irrigation). Access can be made more affordable (e.g.

through economies of scale and the use of targeted subsidies) and infrastructure more reliable (e.g. better maintained electricity supplies)¹².

Reduced up-front public capital investment

Where an infrastructure project is likely to generate sufficient user fees to support the raising of capital by the private sector, this enables the conventional public financing model of infrastructure to change dramatically. Instead of the public sector making a large up-front capital funding commitment, followed by funding of operating expenditure over time, the private sector provides the capital and makes investments within the framework of a concession or long-term lease arrangement. User fees support (in theory) the recovery of these capital costs, as well as covering operational and maintenance costs and providing a profit margin. Variations on the financing of this type of concession model include commitments by the state to long-term purchase agreements (e.g. for electricity supply), and capital and operational state subsidies wrapped up and spread out as periodic service charge payments across the financing life of the project.

“Bundling” design, construction and operations

Rather than there being separate design, construction, financing, operations and maintenance arrangements, as with traditional public sector procurement of infrastructure, involvement of the private sector encourages these functions to be combined under one contractor. This form of integration, or “bundling”, of infrastructure life cycle services within a longer-term contractual framework is attractive to the private sector. Financial incentives are provided for private companies to think beyond a single stage. The approach provides an opportunity to build in features that may improve engineering quality and add value, rather than focusing the private contractor primarily on minimizing costs.

Bundling such as this also promotes “whole of life costing”, including infrastructure upgrading over time. This provides the public sector with predictability in budgeting over the life of the infrastructure and reduces the risks of funds being diverted for other purposes during the period. The approach also reduces the number of “corruption points”, transactions and decisions, which lend themselves to extortion or patronage.

Cost savings

Efficiency can be higher in the private sector, with greater opportunities for economies of scale, strong project management skills, response risk management, more attuned skills, innovative technologies and lower overheads. That the private sector is also better VFM than the public is a controversial argument; this is discussed later in the report. The key factor will be whether the cost of borrowing for the private sector is higher than for the sovereign government. In the Organisation for Economic Co-operation and Development (OECD) countries this is rarely the case, and is in part why engineering unions in industrialized nations are so against PSP in public infrastructure (notwithstanding the cost of managing risk and externalities). In developing countries, particularly those with low international credit ratings, the difference in the cost of borrowing with foreign private firms able to access international investment markets may be less acute. For domestic firms borrowing in local currency, however, the differential with the state is likely to be similar if not significantly higher. This brings us to risk transfer.

Risk transfer

A key benefit for the public sector of PSP is to be able to transfer risk, especially commercial risk. Capital investment in infrastructure is a long-term undertaking, carrying significant risks, including capital cost overruns, volatile demand and political and regulatory risk (e.g. around the stability of tariffs and long-term subsidies). The financing of infrastructure projects can be arranged so as to transfer most of these risks to the private sector. The risk that the infrastructure will not perform as intended can also be transferred, tied to various performance-related payment mechanisms and/or subsidies. Transferring risks to the private sector carries a cost, most directly the cost of arranging third-party guarantees. Indirectly, this comes in the form of higher (risk-adjusted) interest rate spreads and requirements from lenders for safer debt-to-equity ratios. This leads to the critical question of whether public financing or risk-adjusted private financing of infrastructure is the more efficient.

More efficient implementation

The private sector can bring more flexible subcontracting and procurement, quicker approvals for new capital financing, more efficient decision-making and stronger project management. The private sector, particularly larger engineering firms, may well have highly developed supply networks in the country or region able to achieve cost efficiencies through supplier loyalty and the operation of efficient ICT-driven SCM systems.

Investing in human capital

Depending on the particular expertise of the private company or consortium, significant advances in employee competency development can be made. Indeed, some state-owned companies that provide infrastructure services elect to “in-source” the private sector to bring just this type of on-the-job competency development and improve operational efficiency.

2.3.3 Definitions of private sector participation (PSP) and Public-Private Partnerships (PPP)

What constitutes PPP as opposed to the more general PSP varies widely in the literature¹³. In this report, we use the term PPP to mean participation by the private sector (the for-profit or not-for-profit sectors) in the provision of infrastructure services in cases where, if left to the free market alone, such private participation would not occur because of the low returns on investment or the levels of risk involved, financial or non-financial. We therefore exclude fully privatized infrastructure services, such as water supply, because these are operating under free market, or near free market, conditions.

As with the definition of PPPs adopted by the WB Public-Private Infrastructure Advisory Facility (PPIAF)¹⁴, we do include involvement of the private sector in the “corporatization” of public companies to improve infrastructure development or operational efficiency. Depending on how such an arrangement is constructed, this may be little more than a conventional service contract. However, it can also include an element of risk sharing.

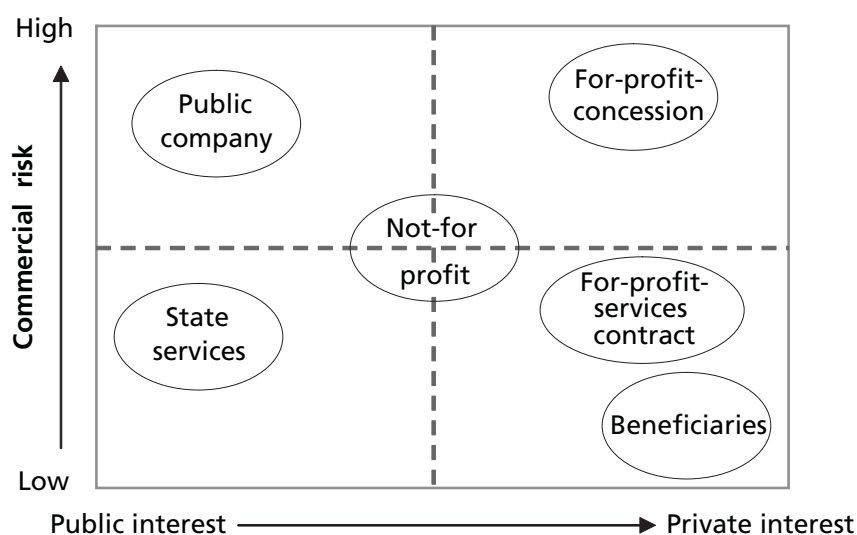
We include international donors in the term “public sector”, both those that lend or make grants to governments, and the bilateral and multilateral Development Finance Institutions (DFIs), such as The Netherlands Development Finance Company (FMO) or the International Finance Corporation (IFC).

Certain jurisdictions have in place specific legislation on PPPs, and thus it is this that frequently defines the scope of the term. To illustrate, in Brazil, the Law on PPP¹⁵ describes PPPs as either:

- *Administrative Concession* – where a private partner takes over the responsibility for project execution and financing, as well as for its maintenance during the term of the contract, with the public authority enabling the recovery of costs by the private entity through the payment of revenues, e.g. through a purchase agreement or shadow user fee; or
- *Sponsorship Concession* – where the private partner secures revenues primarily through the operation of the infrastructure itself (user fees, tariffs), with the authority making part payment or guaranteeing only part of the private partner’s income (in the form of capital grants, purchase agreements, shadow user fees or other subsidies).

A key element of any PPP is deciding how the commercial risk of recovering the service fee is to be allocated between public and private sector. In a strictly service or management contract PPP (i.e. not a concession-based PPP), there are two main choices. In one variant, the private party bills directly (or indirectly through various forms of state guarantees) the public sector and is paid regardless of the level of user demand, thus leaving the main commercial risks with the state. In the other, the private provider is paid according to operational results, either directly by the level of end user demand or indirectly through performance-based subsidies from the public sector. Here, the private operator faces the main commercial risks¹⁶. Figure 2.4 broadly illustrates where the commercial risk lies for different types of infrastructure provision.

Figure 2.4 Mapping risk of cost recovery in Public-Private Partnerships¹⁷



Informal Public-Private Partnerships (PPPs)

A more expansive definition of a PPP is one involving the idea of the informal “pooling” of financial and in-kind resources, of sharing risk (rather than transferring risk) and of achieving mutual “win-win” benefits. The World Economic Forum refers to the core concept of PPPs in very general terms as one involving “business and/or not-for-profit civil society organizations

working in partnership with government agencies, including official development institutions. It entails reciprocal obligations and mutual accountability, voluntary or contractual relationships, the sharing of investment and reputational risks, and joint responsibility for design and execution”¹⁸.

In these more informal PPPs, the aim is to find the optimal combination of the respective strengths to address some persistent or specific challenge to sustainable development. Informal PPP arrangements are becoming more widespread, and take many forms, including combinations of private (for-profit and/or not-for-profit) and public parties (public services or public companies), as well as international donors and the philanthropic arms of multinational corporations. The arrangements may be based on voluntary or contractual agreements.

Few of these informal partnerships, however, are focused on infrastructure provision, and fewer still on infrastructure dedicated to market-oriented agricultural development. Where they are applied in this way, they seem most relevant to irrigation, where the not-for-profit element (farmers cooperatives) WUAs are incorporated in the project to improve access and affordability for smallholder farmers, either through improved design or less risky operations, e.g. using community-based mechanisms to resolve user disputes and ensure more efficient collection of user fees.

The partnering process

An alternative approach to understanding PPPs is to worry less about the definition in terms of the end configuration and focus more on the “partnering process”. Rather than there being a “best fit” model or variant of a partnership in a given situation, what is perhaps replicable is a structured process of infrastructure planning, financial design and procurement, one that leads to the best mix of private and public competencies, the right balance of costs and risks, and the right rewards.

2.3.4 Failures of the private sector to participate in agricultural infrastructure

In the past two decades, market-oriented economic reforms have attempted to stimulate infrastructure services based on private sector provision, with cost recovery through tariffs. These reforms have succeeded in certain areas: telecommunications and power in particular. However, a gap still remains between what private service providers are prepared to do purely on commercial grounds and what governments consider necessary from broader development and poverty reduction perspectives. Thus, many rural areas continue to be excluded from infrastructure services, and are in need of subsidies¹⁹.

Financial constraints

Although there is some evidence that rural households and businesses are willing to pay more for infrastructure than peri-urban or urban areas²⁰, the private sector, including many private banks, perceive participation in public infrastructure in remote rural areas to be commercially unattractive. For potential investors of physical infrastructure aimed at agricultural development, the cost of capital is prohibitive, and loan maturities rarely exceed five years, insufficient to meet the prolonged financing terms needed for capital infrastructure development²¹. From the lenders perspective, dependency on the agricultural production for cost recovery means that risk-adjusted returns are lower than in other infrastructure sectors. The peculiar risks include:

- Weather and climatic volatility and its major impact on production;
- Disease and pests that affect production;
- Regional and international competition, causing tight pricing in commodities;
- Demographic trends in the farming sector, e.g. an aging farm population and high rural-to-urban migration of the able-bodied;
- Negative environmental impacts, such as salinity or waterlogging affecting production;
- Constraints in supply-chains for agricultural inputs (fertilizers, seeds, essential equipment, etc.);
- Coordination failures in distribution networks, e.g. gaps in road networks;
- High cost of borrowing for farmers, prohibiting growth prospects;
- Lack of crop insurance on the part of producers.

These risks mean that revenue flows from infrastructure user fees can be highly unpredictable. Adjusting the price of debt to accommodate these risks can soon put loans out of reach for all but the largest-scale investment opportunities. Likewise, credit risk guarantees to support longer-term loans are expensive in the agricultural sector. Local banks, regional development banks and even international development finance institutions limit their exposure to these instruments.

The commercial risks are highest not only where the role of the private sector is to bring greater efficiency to the operation and maintenance of existing infrastructure, but also where the intention is that PSP will access finance to expand the infrastructure network (be that roads, irrigation, communications technology, etc.). This can lead to rapid rises in user fees and tariffs to support capital cost recovery, which can then challenge the political acceptability of the project. Recent cases of private sector investment in expanding water supplies are a case in point, for example the ongoing dispute between Biwater and the Tanzanian Government.

The low relative returns and high risks have caused lenders to close down specialist agribusiness credit teams. This has in turn reduced the level of expertise available to appraise the risks involved in lending to this sector. DFIs have attempted to fill some of these staffing voids, but many remain wary about agriculture-focused investments. For example, the United Kingdom CDC Group, after declining to invest in agricultural projects for many years, has recently established a new Africa Agribusiness (equity) Fund, with a remit to invest across the agribusiness value chain from input supply, through production, processing, distribution to marketing²². To some extent, this exception proves the rule, with expectations by the group that returns will be lower than for their principal funds in power and telecommunications.

The failure of the private sector to participate more in public infrastructure for agricultural development is demonstrated by an analysis of the WB database on PPI in developing countries.

An analysis of the project detail reports of 2003 to 2005 showed that, across the database as a whole (595 projects with a total investment value of US\$216 billion), just 18 infrastructure projects, totalling US\$1.9 billion (1 percent of total investment value), could be attributed to infrastructure that was intended to raise agricultural productivity, either directly (e.g. wastewater treatment for agricultural waste, such as bagasse and rice husks) or indirectly (e.g. rural electrification schemes or extension of telecom coverage to rural areas). Excluded are PPI

projects in urban areas that also indirectly support agricultural growth, e.g. airports and ports (see Table 2.1).

Table 2.1 Agriculture-related infrastructure investments in the WB PPI Database

Region	Total investment 2003–2005 (US\$ billion)	Rural/agriculture- related investment 2003–2005 (US\$ million)	Total No. of projects 2003–2005	Rural/ agriculture- related projects 2003–2005
East Asia and Pacific	40.0	325	199	3
Europe and Central Asia	61.2	115	85	1
Latin America and Caribbean	58.1	425	129	5
Near East and North Africa	15.3	20	35	1
South Asia	28.5	126	63	3
sub-Saharan Africa	15.3	857	84	5
Total	218.4	1 868	595	18

In deciphering these supposed failures of the private sector to show interest in agricultural infrastructure, it is important to separate out the following:

- Problems that arise because different types of infrastructure (telecommunications, roads, irrigation, etc.) create very different levels of demand, and have different capital costs, user fees, commercial risk and requirements for subsidy;
- Failings that arise from institutional and governance weakness in state regulation or private entity performance from the economic problems inherent to low-income rural areas;
- The issue of service delivery from financing, for example, private sector partners may be involved in increasing the efficiency and effectiveness of infrastructure operations and maintenance delivery without needing mobilizing finance other than working capital²³.

In rural areas dominated by subsistence agriculture, low population densities and low levels of household capital accumulation and savings, large numbers of farmers cannot afford to pay user fees if these include the recovery of costs for constructing infrastructure assets, e.g. irrigation expansion or telecommunication relay stations. In these cases, if a private firm is best placed to provide the public service, for reasons of efficiency, some form of alternative capital cost recovery mechanism will be needed. This could be a state or donor subsidy, or some indirect revenue stream, such as the sale of land within the concession that has increased in value owing to the existence of the infrastructure.

For many poor communities, it is not only the recovery of capital expenditure for infrastructure that lies outside the ability of household incomes to provide, but often the long-term operating and infrastructure maintenance costs as well²⁴. These financial constraints mean that financing for agricultural infrastructure frequently needs to combine public and private financing. The United Nations (UN)-sponsored Financing for Development Conference in

Monterrey in 2002 concluded that new and greater cooperation between public and private actors would be required to overcome the proven inadequacies of current development finance to achieve the internationally agreed development goals²⁵ (see Box 2.1). Building on this event, in July 2005, leaders at the Group of Eight industrial nations (G8) Summit in Gleneagles called for the use of PPP mechanisms in Africa to increase direct investment in infrastructure and utilize market incentives²⁶.

Box 2.1 Inadequacies of development finance institutions

The principal criticism of development finance institutions, in particular multilateral development banks, is that “these institutions find themselves in the paradoxical position of deploying less and less of their resources at a time when taxpayers in donor countries are being called upon to commit more and more of their national budget to poverty reduction”. For example, as a result of a falling demand for traditional loans, the unused capacity of the WB to lend was US\$78 billion at the end of 2004²⁷.

In response, there is a call for these institutions to adapt their services to the task of “crowding in” domestic and foreign private investment, by placing far more emphasis on non-financial risk mitigation instruments, such as developing a robust local currency capital market and bank lending institutions, and building capacity in property rights, contract dispute adjudication, bankruptcy, accounting and auditing, corporate governance and banking supervision.

It is not surprising, then, that donors continue to experiment with a number of financial risk management facilities designed to enable the private sector to take a financial role in rural infrastructure in frontier areas. These include the PIDG family of facilities – GuarantCo (providing partial risk guarantees to facilitate local currency debt financing for infrastructure by domestic banks); the Emerging Africa Infrastructure Fund (EAIF) (providing long-term debt to support the extended payback periods of infrastructure projects); and InfraCo (providing various project planning and development services for high risk infrastructure projects) – as well as other multidonor initiatives, such as the (GPOBA), which provides performance-driven grant co-financing (i.e. subsidies) for high risk/low return infrastructure projects.

Institutional constraints

Beyond the financial constraints, the other core set of limitations on the effectiveness of PSP in infrastructure for agricultural development have to do with institutional capacity and the policy environment. These constraints can be summarized as follows^{28 29 30 31}:

- absence of legal framework for clear and transparent procurement procedures, including performance-based contracts;
- governments unrealistically proposing PPPs as politically high-profile actions, with no cost to national or local budget;

- during or after contract negotiations, governments gradually accruing all the risks they had hoped to transfer to the private sector;
- unrealistic aims for private sector, i.e. full financial risk transfer with low rewards;
- negative popular political perceptions of private sector accountability in long term – monopolistic, rapid user fee rate rises;
- local governments and smaller firms with low capacity to negotiate or undertake a process of competitive tendering;
- poor access to predictable and affordable finance for the private sector;
- risks that governmental or donor funds are misused to subsidize private interests, or unfounded perceptions of risk;
- inexperience in drawing up contracts – leading to ambiguities or clauses that are too harsh or too lax and distort the contract’s objectives;
- the importance of achieving a viable risk-adjusted return on investment for the private sector, meaning the possible neglect of the interests of the poor within the PPP payment terms;
- infrastructure coordination “bottlenecks” – single road, warehouse, ICT system – that can lead to extortion.

2.3.5 Checklist for decision-makers

In summary, the persistent challenge seems to be to know when and where PSP is a value-adding proposition for providing market-oriented agricultural development, and how best to formulate the financial and institutional arrangements for its participation. Domestic government and international donors alike are questioning what the role of the private sector “should be”. The lesson to date is that the approach will not work in all cases, and that “a PPP can never turn a poor investment into a good one”³². However, with a renewed commitment to fund rural infrastructure, and governments and international donors experimenting with new forms of finance and contracting, there are real opportunities to broaden the role of the private sector in agricultural development.

Box 2.2 provides a checklist – a series of questions to aid decision-makers in determining which types of agricultural infrastructure might benefit from, and be attractive to, the private sector.

Box 2.2 Checklist for PPPs in infrastructure for market-oriented agricultural development

1. Strategic planning

Which strategic infrastructure choices would most enhance agricultural development in relation to the intended development outcomes (productivity, diversity, employment, etc.) and specified markets (local, urban, export)?

2. Private sector factors

Which of the strategic choices in Question 1 might be attractive to the private sector because they offer:

Commercial potential

- a. An investment opportunity in an infrastructure network that is already relatively developed?
- b. Opportunities for “greenfield” sites and network expansion that allow the project sponsor to implement its own technology (rather than work with existing, possibly substandard infrastructure)?
- c. Infrastructure services with significant growth potential, e.g. located in rapidly developing agricultural areas?
- d. Potential for design innovations and operational changes to raise current levels of public sector inefficiency?

Scale

- e. A total capital investment value sufficient to warrant the high sunk costs involved in project development and competitive bidding?
- f. Opportunities to combine or “bundle” infrastructure in different sectors together to raise the overall investment value and spread demand risks, e.g. rural roads with agroprocessing, electricity generation with irrigation?

Finance

- g. Sufficient revenues (user fees or purchase agreements), fewer associated capital and operational and overhead costs, to meet debt repayments and return a profit acceptable to shareholders?
- h. If equity is involved, an appropriate return on equity (ROE) to shareholders, combining fees, dividends and exit value?
- i. A debt equity sufficient to attract private equity?
- j. A healthy debt service cover ratio (DSCR) , e.g. over 1.5 – the cash flow available to meet the debt service (interest and principal) payable over the same period (higher ratios if adjusted for risk)?
- k. A loan life cover ratio (LLCR) in a similar range to DSCR range – the net present value of future cash flow available for debt service against the total outstanding amount of debt for the duration of the debt?

Risk

- l. A limited number of significant off-takers or purchase agreements to reduce complexity and operational costs?
- m. If multiple users, their willingness and ability to pay for infrastructure services sufficient to meet recovery of investment costs plus a profit margin?
- n. An additional indirect source of revenues, e.g. increase in price of adjacent land?
- o. Low levels of market (demand) risk?
- p. Insurable political risks?
- q. Commercial risks able to be better managed by the private sector?

3. Public sector roles

Which of the following roles for the public sector (domestic government, agency or donor) would be needed to ensure participation by the private sector:

- a. Procurement – tendering procedures that are quick, competitive, transparent and accountable, with low information and transaction costs?
- b. Subsidy competition – institutional capacity to implement and manage a competitive subsidy mechanism?
- c. Project development – technical assistance with high risk project development phase?
- d. Contracts – construction and service performance outcomes clearly specified and measurable?
- e. Incentives – payment mechanisms that provide operators with the motivation to maintain a high level of service quality and extend reach or improve performance?
- f. Demand management – long-term and reliable purchase agreements and/or shadow user fee subsidies that provide secure revenue flows?
- g. Interagency coordination – sequencing of rural infrastructure investments and regulatory reform across government departments?
- h. Subsidies – government has access to stable and reliable sources of subsidies, e.g. from national budget, cross-subsidies, donors (for capital expenditure, or pro-poor targeted short-term/long-term operations and maintenance subsidies)?
- i. Financing – government or donor to participate in or assume/provide the following financing?
 - i. share of equity (type of shareholding)
 - ii. concessional loans – low interest rates, risk adjustments on spreads accurately assessed
 - iii. longer-term maturing debt
 - iv. sufficient grace period
 - v. quasi-equity, e.g. subordinated debt, other mezzanine debt
 - vi. credit risk guarantees, e.g. for domestic commercial banks, or arrangement of third-party guarantees
 - vii. sovereign guarantees, whereby government (or donors) stand behind defaults on purchase agreements or other principal revenue flows, e.g. user fees
 - viii. export credit guarantees for foreign companies
 - ix. managed exchange rate risks, e.g. through hedging
 - x. a short-term debt facility to cover shortfalls in cash flow
- j. Risk management – clear risk transfer and allocation between private and public parties?
- k. Regulatory reform – various, e.g. legal framework for “corporatization” of public utilities; legal framework for low-income end-user to spread payments over time, both connection charges and user charges?
- l. International arbitration – e.g. International Centre for Settlement of Investment Disputes(ICSID)?
- m. Engineering capabilities – government support to improvement of capabilities in the engineering subcontractor market and ensure sufficient numbers of qualified firms to support competitive bidding processes construction and maintenance engineering works?

3. Building blocks of Public-Private Partnerships

Taking the broad definition of PPPs developed earlier, this section summarizes the main variables involved in formulating a PPP in the context of infrastructure for agricultural development. Where relevant, references are made to the examples discussed in Sections 4 to 8.

The “building blocks” discussed in this section fall into five parts:

- *Strategic infrastructure planning for agricultural development*: identification of the development goals for investment in agricultural infrastructure (beneficiaries, effect on agricultural growth, access to markets, impact on wider economy, etc.); what infrastructure types, scale and sequencing is needed to achieve these goals; and the strategic value added by involving the private sector.
- *Commercial viability and VFM*: what financial arrangements for the development or maintenance of agricultural infrastructure would yield commercial returns for the private sector, and whether these arrangements represent VFM to the public sector.
- *Divisions of risk*: the transfer or retention of commercial and political risks between the public and private parties.
- *Contractual arrangements*: the form of contract agreed between the public and private party necessary to facilitate cost-effective infrastructural development or maintenance in different circumstances.
- *Institutional and support mechanisms*: the legal framework necessary to encourage and regulate private participation in agricultural infrastructure; the need for political and popular support; and the importance of overcoming weaknesses in project preparation and procurement.

3.1 STRATEGIC INFRASTRUCTURE PLANNING FOR AGRICULTURAL DEVELOPMENT

Identifying where and when to leverage interest from the private sector in infrastructure for agricultural development is a matter of marrying identification of the strategic need for new capacity, or improved quality in the infrastructure network, with whether such needs offer an attractive proposition to the private sector (or can be arranged to do so), and whether both the public and private sectors have the capability to cooperate.

3.1.1 Capacity needs in the physical infrastructure network

The infrastructure constraints on farmers to sustain growth in agriculture are numerous. Physical infrastructure is only one aspect. Others include financial infrastructure, technological infrastructure, social infrastructure (health, education and training), and legal and regulatory infrastructure. However, the physical infrastructure component of agricultural development, especially for smallholder farmers and smaller commercial farms that do not have access to private provision, is often critical. Many of the recent success stories in agricultural development in Africa and Southeast Asia have depended on strategic investments in physical infrastructure, for example, growth of horticulture and flower production and export from Africa to Europe³³, the development of the smallholder dairy farming industries in Kenya, Tanzania and Uganda³⁴, and the rise in rice production in Viet Nam³⁵.

In general, low-income rural areas suffer infrastructure deficiencies in transportation, energy and telecommunications, leading to high transactions costs, poor spatial integration, poorly functioning domestic markets, weak international competitiveness and low price transmissions³⁶. Despite evidence of how rural, and in particular agriculture-oriented, infrastructure can promote economic growth and alleviate poverty, national governments continue to be reluctant to prioritize investments to this end, unless encouraged to do so by international donors. For example, in Cambodia – where 80 percent of the total population lives in rural areas, 70 percent of whom rely on risky rainfed farming systems – international donors dominate the public investment budget, with 40 percent of the total investment for the next five years directed towards physical infrastructure. The focus of this investment is on transportation, water, electricity and telecommunications, with the large majority to be invested in rural areas to improve supply inelasticity in agricultural production, processing and distribution^{37 38}.

With regard to agricultural development planning, there are essentially two sets of strategic choices when deciding to invest in physical infrastructure: choices around (i) the desired development outcomes, such as productivity, diversity or employment, and (ii) the intended markets (local, urban or export). These are discussed briefly below. Inclusion of such strategic questions in this report is intended to highlight the importance of ensuring that agricultural development planners and economists ask first “what the desired development strategy is”, and only second “whether the private sector can play a value-adding role”.

Strategic development outcomes

Intended development outcomes can be divided into three key challenges³⁹:

- *The productivity challenge* – investment in physical infrastructure to improve agricultural productivity (e.g. output per worker, inward investment in technology or more efficient production), with a focus on irrigation, power, telecoms and transportation for agricultural inputs.

An alternative strategy to raising productivity is to invest in social infrastructure, with the goal of improving living standards in poor rural areas. This in turn improves agricultural productivity. For example, more efficient and affordable basic household services – water and sanitation, household electricity, access to affordable health care, basic education, public transport services – may improve the productivity of farm workers and managers.

As a public investment strategy for agricultural growth, this approach can be consumptive in the short term, causing recurrent spending budgets to rise, but can deliver sustainable improvements in agricultural productivity in the longer term. The focus of this report is on PSP in infrastructure that addresses agricultural development more directly, yet it should not be forgotten that PPPs have a role to play in water supply, health care and education as well.

- *The diversification challenge* – investment in infrastructure to specifically broaden the base of agricultural economic activity in rural areas, for example, to reduce the risks of monocropping, or to foster more off-farm income opportunities in agricultural processing. PSP in infrastructure types here could focus either on the farm level, e.g. irrigation to support out-of-season cropping, or on processing, e.g. widening the scope of crops handled by a pest treatment facility.
- *The employment challenge* – landlessness is a growing problem in many rural areas, with land consolidation; the granting of concessions for commercial agriculture; rising prices incentivizing farmers to sell; and insufficient land to meet natural demand from population growth. Rural employment is a key development aim of many national and provincial authorities; physical infrastructure can play its part, helping to diversify the rural economy into non-agricultural economic activities, including tourism, new rural market centres, and seasonal employment.
- *The broader development challenge* – infrastructure has multiple uses, and investment strategies can be designed to support both agricultural development *and* broader rural development. For example, widening access to telecommunications technology in rural areas increases communication between urban buyers and rural producers, enabling the transmission of changes in the cost of inputs and prices at market. The same infrastructure may also increase the availability of information on health services and other government services⁴⁰. Likewise, upgrading rural road surfaces to lower agricultural transaction costs may in turn allow households to switch to alternative fuel sources (e.g. from wood to butane), thus saving time for women in daily wood collection and enabling investment of more time in crop production⁴¹.

Assessing the role for a private party in constructing and/or operating infrastructure in rural areas needs to move beyond questions of commercial finance and risk transfer, but also focus on the likelihood that such participation will deliver an improved development outcome, in alignment with the intended strategy for agricultural development.

Intended market

The focus of this paper is market-oriented infrastructure development. Assessing infrastructure capacity and the role of PPPs in relation to different markets is critical. Markets vary, but three broad types can perhaps be distinguished.

- *Local rural markets* – infrastructure designed to enable smallholders to access local markets, through on-farm productivity and distribution improvements, e.g. arising from reduced input costs (local transportation, wholesale markets), higher yields (e.g. irrigation works, more reliable electricity), or reduced distribution costs.

- *Domestic retail food market* – one projection puts the anticipated rise in farmgate income from growth in retail urban African food markets in 2030 at eight times (800 percent) that to be generated from export sales⁴². The task for infrastructure planners is to ensure that smallholder and medium-scale commercial farmers – and not only export farmers and large-scale commercial farmers – benefit from this growth in urban markets. The challenge is to remove infrastructure constraints on efficient price transmission (e.g. through improved transportation), and to support investments in agroprocessing to meet the specific demands of the new retail urban markets, e.g. for sugar, processed meats, fish, milk products, cereals, vegetables, salads and fruits.
- *Export markets* – these are of two types: bulky products needing volume storage, processing, road and shipping transportation, e.g. cereals, sugar cane and cotton; and infrastructure (including cold-chains, high-tech processing) that supports perishable, high-value products, e.g. tea, sugar, fresh horticultural produce, cut flowers and specialist vegetables.

Value chain analysis (VCA)

A VCA methodology can assist in identifying strategic infrastructure and identifying where the private sector might participate. VCA is about better positioning a farm or agroprocessing unit within the context of a particular market. That is, finding a competitive or investment “niche” within the full range of production, distribution and informational activities that lead agricultural produce and products, from conception, through intermediary phases of production and transportation, to retailers and consumers⁴³. It is also about identifying strategic interventions that the public sector, international donors and large buyers can make to strengthen agricultural economic activity. Deciding between different choices for physical infrastructure – different locations, types and scale, etc. – and identifying the best “fit” for the private sector in infrastructure financing, construction, operations and maintenance, is one aspect of VCA that could be further explored by FAO.

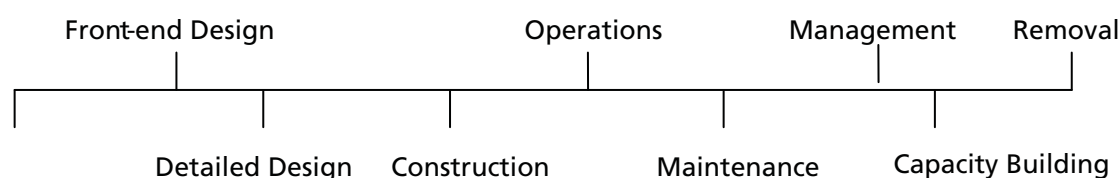
To illustrate: Improving access for smallholders to local rice-processing markets may be critically constrained by poor road transportation. The owners of a rice milling facility may consider it to be in their commercial interest to invest in the road network to improve the reliability of supply. But, given that the infrastructure is also a broader public good, they would expect a sizable subsidy from the municipal authorities or central government. The same VCA may identify the critical nature of wholesale markets to act as a brokerage point for agricultural inputs and trading, as illustrated by the Kopani and Gdansk Wholesale Market PPPs in the Ukraine and Poland, respectively (details in Section 6.1.1).

In other circumstances, the demand risks might be assessed as being too high to attract private finance, suggesting that some type of long-term management contract with a private operator (rather than a concession arrangement) might be a better solution, with the aim being to ensure maintenance of the physical structure and its cost-efficient operation. Alternatively, the terms of lease or concession agreements might incorporate additional commercial incentives, such as the right for a concessionaire to earn additional revenues by on-leasing or sale of unused land within the concession area following investments in utilities and transportation infrastructure. Such a case is illustrated by the Gdansk Wholesale Market PPP in Poland (see Section 6.1.1).

3.1.2 What is attractive to the private sector?

As noted, in the strategic planning of market-oriented agricultural infrastructure, the question is not only whether the private sector has capabilities to bring to bear on infrastructure provision, but whether there is a commercial case for doing so. For example, the private sector often prefers a “greenfield” location, where it can establish its own technology and operational systems, and thereby reduce the risks otherwise associated with raising established tariff levels or working alongside inefficient public authorities. Furthermore, within any one single infrastructure project, different aspects of project execution may be more or less attractive to the private sector (see Figure 3.1).

Figure 3.1 Aspects of an infrastructure project that might involve the private sector



Most significant for the private sector is to ask from where the revenue stream in the PPP arrangement is to be derived (user fees, subsidies, purchase agreement, etc.), whether this will be sufficient to cover investment costs and return a profit, and what the risks are to the reliability of these revenues. For example, toll roads are only possible in transport corridors with a commercial potential. The experience of the South African National Roads Agency is that commercial viability can be achieved only in corridors with more than 3 000 to 3 500 vehicles per day. This would preclude the vast majority of rural roads in smallholder agricultural areas⁴⁴.

Other critical questions include: (i) whether the proposed infrastructure offers growth potential (e.g. is located in rapidly developing agricultural area), or offers potential for design innovations and operational changes to raise current levels of public sector inefficiency; (ii) whether the commercial scale of the opportunity would warrant the high sunk costs involved in project development and competitive bidding by the private sector; and (iii) whether there are opportunities to combine or “bundle” infrastructure in different sectors together to raise the overall investment value and spread demand risks, e.g. rural roads with agroprocessing, electricity generation with irrigation. Just such questions challenged InfraCo (a donor-supported PPP project development company) when designing the Kalangala Integrated Infrastructure Services (KIIS) Project in Uganda (full details in Section 4.4.1).

Box 2.2 in chapter 2 presents a more detailed checklist of questions public authorities need to ask in determining the attractiveness of an infrastructure project to a PPP approach and the role that public sector or donors might be asked to play in the arrangement.

3.1.3 Strategic development of public and private capabilities

In addition to knowing where to improve infrastructure to overcome strategic constraints, and which infrastructure projects might be attractive to the private sector within a PPP arrangement, strategic planning should also consider the capabilities of the public and private parties to deliver network expansion and operate services. Agricultural infrastructure planning may need to combine short-term strategies that utilize the current capabilities of private and public parties to engage in infrastructure design, construction and operations, with long-term strategies that take account of the rate at which these institutional and human capacities might be improved over time.

The need for capability development lies at the heart of many informal multistakeholder partnerships, as well as being the basis for in-sourcing of the private sector into public utilities. The intention of informal multistakeholder partnerships convened to support rural infrastructure is often tied to an experimentation, or pilot scheme, with one or other parties essentially concurrently building the competencies of one of the others. Thus, NGOs might collaborate with private infrastructure companies and public authorities to better understand the rural customer base for infrastructure, for example, by helping to design upgrades to processing and packaging facilities in ways that encourage participation by smallholders, or developing community-based payment and collection mechanisms to reduce demand risk in irrigation projects.

Similarly, involving private companies in the operations of public companies can be just as much about improving the management efficiency of officials and “corporatizing” the public entity as it is about securing rapid improvements in service delivery. For example, it is not uncommon for private parties to be “in-sourced” to public infrastructure service companies for a limited period to reduce wastage and improve revenue collection (thus lowering the draw on annual spending budgets), or to improve efficiencies in readiness for the organization to be incorporated as a public company.

More generally, ambitions for involving the private sector in agricultural infrastructure may be constrained by the capacity of the public sector and the private sector to collaborate and develop viable PPP projects together. Institutional weaknesses in the public sector frequently lie in being able to develop conceptual and front-end infrastructure designs, in financial structuring, competitive procurement, and in contract negotiations and management. The private sector, too, faced capability constraints, including the accurate pricing of risk, competency in structuring complex financial deals, accessing third-party guarantees and insurance, and negotiating performance-based contracts. Reflecting these capability gaps, international donors provide various forms of technical assistance for infrastructure PPPs (see Box 3.1). Indeed, many of these facilities play a role in the illustrations of different PPPs discussed in the remainder of this report. Further details of these facilities are given in Annex D.

Box 3.1 Donor technical assistance for project development in infrastructure PPPs

- Public-Private Infrastructure Advisory Facility (PPIAF)
- The Private Sector Development Group (The PIDG family)
 - The Emerging Africa Infrastructure Fund (EAIF)
 - Infrastructure Development Company (InfraCo)
 - Local Currency Guarantee Facility (GuarantCo)
 - Technical Assistance Facility (TAF)
 - The Asian Private Infrastructure Financing Facility (AsPIFF)
 - Project Development Facility (DevCo)
- GPOBA
- IFC Technical and Advisory Services
- IFC Private Enterprise Partnership for Africa (IFC PEP Africa)
- IFC/ WB Foreign Investment Advisory Service (FIAS)
- Multilateral Investment Guarantee Agency (MIGA), Technical Assistance Programme
- European Bank for Reconstruction and Development (EBRD)
- Technical Cooperation Funds Programme (TCFP)
- Facility for Euro-Mediterranean Investment and Partnership, Technical Assistance Support Fund (TASF FEMIP)
- The EU-Africa Infrastructure Trust Fund
- Cotonou Agreement Investment Facility
- Infrastructure Project Preparation Fund (InfraFund)
- The new Partnership for Africa's Development (NEPAD) Infrastructure Project Preparation Facility (NEPAD-IPPF)
- NEPAD Infrastructure Investment Facility (NIIF)
- Investment Climate Facility for Africa (ICF)
- Growing Sustainable Business (GSB) Initiative
- Infrastructure Consortium for Africa
- EU Trust Fund for Infrastructure Development

3.2 COMMERCIAL VIABILITY AND VALUE FOR MONEY

Two further questions lie at the centre of any decision to form a PPP for agricultural infrastructure development:

1. For the private sector – what contractual and financial arrangement would yield a commercial, risk-adjusted return and acceptable remuneration for overheads (staff salaries, equipment, office space, etc.)?
2. For the public sector – will this arrangement deliver the necessary performance of public service required and is it VFM?

For a public-private partnership to work, the relationship must satisfy both these sets of strategic interests. If a not-for-profit private party is involved, there may also be special interests that need to be satisfied, such as infrastructure accessibility and affordability for the poorest.

3.2.1 Conflict between development and commercial interests

Leaving aside the not-for-profit sector for a moment, if the risk-adjusted returns and/or remuneration of overheads to the private sector for their involvement in agriculture infrastructure provision is not commercially viable throughout the life of the project, either the private sector will not take part, or it will, but the project runs the risk of ending in failure. At present, 119 cases are pending at the WB-affiliated ICSID, each seeking resolution of disputes arising in contractual arrangements between governments and foreign private companies and investors (see Box 3.2 below)⁴⁵. Of these, 37 are for infrastructure projects: 24 relating to power generation or distribution projects, 7 water supply projects, 5 transportation projects, 4 telecommunications projects, and 1 agribusiness project.

Most of these cases are disputes between the public authorities and private companies over either the perceived failure of some infrastructure service to deliver the development outcomes anticipated of the public sector and consumers, or the failure of the project to generate the financial returns or overheads remuneration anticipated by the private parties, or both.

Box 3.2 International Centre for Settlement of Investment Disputes⁴⁶

The ICSID was created in 1966 by the WB, with the overriding purpose to facilitate the settlement of investment disputes between governments and foreign investors and thereby promote increased flows of international investment. The ICSID was established under the Convention on the Settlement of Investment Disputes between States and Nationals of Other States.

The ICSID has an Administrative Council and a Secretariat. The Administrative Council is chaired by the WB's President and consists of one representative of each state that has ratified the Convention. Annual meetings of the Council are held in conjunction with the joint Bank/Fund annual meetings. ICSID is an autonomous international organization. However, it has close links with the WB. All of ICSID's members are also members of the Bank. Unless a government makes a contrary designation, its Governor for the Bank sits ex-officio on the ICSID's Administrative Council. The expenses of the ICSID Secretariat are financed out of the Bank's budget, although the costs of individual proceedings are borne by the parties involved.

3.2.2 Achieving commercial viability

Subsidies

Infrastructure geared towards agricultural development, particularly for smallholders, is frequently characterized by low-currency revenue streams, high demand risks (linked to volatile agricultural production and lack of stabilizing assets), low returns, long periods for cost recovery and relatively small scale. This is a generalization, of course, and different infrastructure types in different locations aimed at different markets will have more, or fewer, of these characteristics.

At one extreme, in India, a recent least-cost subsidy auction for rural telecommunications mobile phone network services resulted in a number of bidders asking for a “zero” subsidy from the cross-subsidy Universal Service Obligation Fund (USOF), and even some negative bids (i.e. offering to pay to manage the concession⁴⁷). This indicates that few of the above constraints on achieving commercial viability applied.

And yet, the same auction also resulted in US\$570 million of subsidies being provided to private and public sector companies to overcome the higher commercial risks involved in financing the physical “backbone” infrastructure: relay towers and base-stations.

Thus, at the other end of this spectrum, financial returns on investment for certain infrastructure projects can be zero, with 100 percent capital and operational subsidies needed to attract the private sector and create a commercially viable project. There are few examples of rural feeder roads raising user fees, for example.

With other infrastructure types, it is economic and social issues, not financial, that can undermine the commercial viability of a project and render it unattractive to the private sector unless subsidies are provided. For example, smallholder irrigation facilities frequently suffer interfarmer disputes that affect user payments; agroprocessing projects are as risky as the farming systems they depend on. Here, then, subsidies may also be needed, for example, in the form of a sovereign-backed guarantee against demand risk, or shadow user fees.

But achieving commercial viability in a PPP is not only about public subsidies. It is also about structuring the financing so that capital is affordable, costs recovered, financial risks managed and profits returned. Key elements of successful financing for PPPs are described below: working capital and cash flow, equity, debt and guarantees.

Working capital and cash flow

Regardless of the type of PPP arrangement (concession, lease, management or service contract), the private party will need access to working capital to cover initial start-up costs: office space, equipment, initial staff costs, permitting costs and various administrative and other overhead expenses. Access to additional working capital (cash flow) will also be needed to cover capital, operational or maintenance costs where there is a shortfall in meeting expectations on revenues. Examples might include delays in subsidies arriving from government to cover the capital costs of road construction; lower than anticipated numbers of customers for wholesale markets; poor uptake by outgrowers to supply an agroprocessing facility; or unreliable payments under an offtake agreement for rural electricity generation.

Initial working capital will either derive from the retained earnings of the parent company (for example, if the infrastructure project is implemented via a purpose-built subsidiary), or from equity, if established as a Special Purpose Vehicle (SPV). The former is most likely for service and management PPP contracts, the latter for concessions and long-term lease or licensing arrangements that can command non-recourse finance. In some cases, cash flow may also derive from donor or state grants. For example, in the early operating years of a fruit fly treatment facility PPP in Fiji, working capital was sourced in grant from the Fiji-New Zealand Business Council and the New Zealand development assistance agency (see Section 7.2 for details).

In general, for higher risk agriculture infrastructure projects, adequate initial working capital and access to a short-term affordable debt facility to cover shortfalls in cash flow are likely to be important factors in attracting private sector lenders. The importance of adequate cash flow from user fees, purchase agreements or public subsidies is reflected in two key financial indicators:

- The DSCR – the cash flow available to meet debt service payments (interest and principal) payable over a particular period (e.g. quarter or annual), at least more than 1:1, and far higher for risky projects;
- The LLCR – the net present value (NPV) of future cash flow available for debt service against the total outstanding amount of debt for the duration of the debt.

Both of these measures are used to support investment decisions in PPPs by lenders.

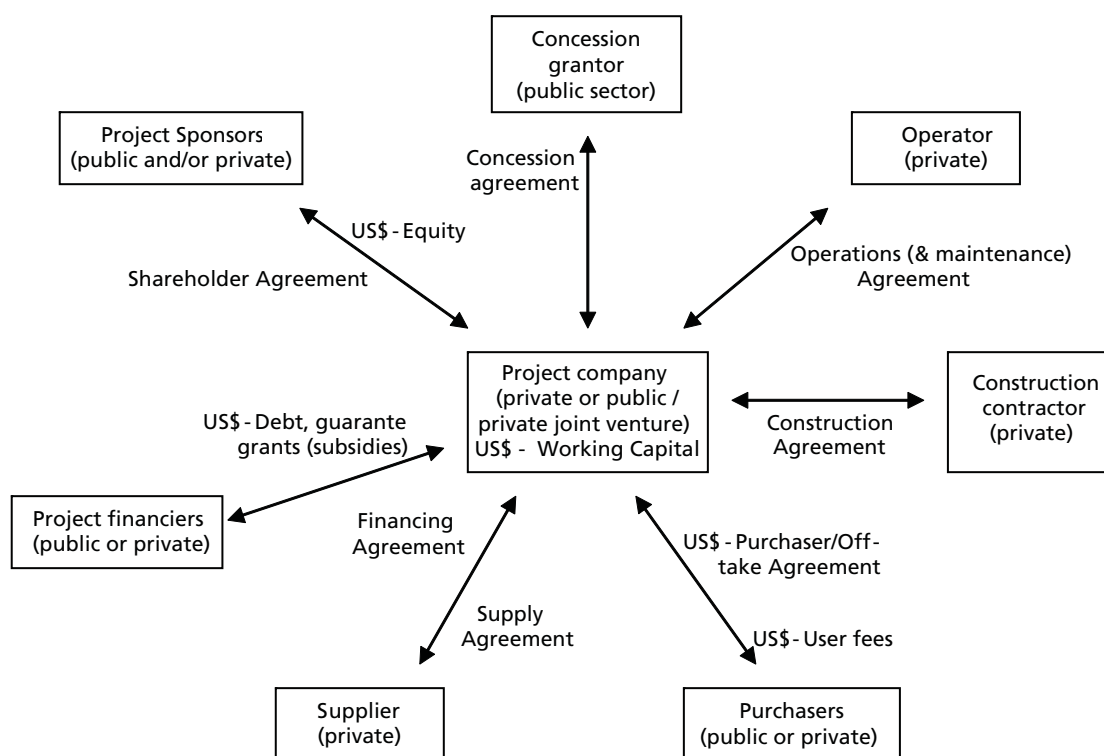
Equity

Equity can play a crucial role in infrastructure financing in at least two ways: first, as the essential element of non-recourse finance; and second, as part of corporate finance. Given the high risks involved in infrastructure, companies may elect to use a project finance arrangement, i.e. “non-recourse” financing. This entails establishing a separate legal entity – a SPV – and using the long-term nature of concessions or leasing arrangements, along with secure long-term purchase agreements or predictable user fees, as the basis for attracting equity and loans⁴⁸. The complexity of this financing, and the high transaction costs involved in establishing the commercial structures, makes them suitable more for larger-scale infrastructure, or where different types of infrastructure can be bundled together. The KIIS Project in Uganda is a case in point (see Section 4.4.1).

What makes project-financed infrastructure particularly attractive from a private sector perspective is that, if the project fails, this failure does not jeopardize the financial integrity of the corporate sponsor’s core business. Figure 3.2 shows the building blocks for a concession-based PPP based on project finance and the role equity plays within this.

As well as putting its own capital into the SPV, the corporate sponsor may be able to attract equity participation from DFIs or private equity firms. One estimate puts the maximum equity that project sponsors are willing to take on for project-financed infrastructure in developing countries at 10 to 20 percent⁴⁹. The remainder thus has come from the government, DFIs or private equity. All the principal regional multilateral DFIs can commit funds to this type of equity: the IFC, EBRD, Inter-American Development Bank (IDB), Asian Development Bank (ADB), African Development Bank (AfDB), European Investment Bank (EIB). So can a number of state-owned development finance institutions: FMO, Deutsche Investitions (DEG) and the Société de Promotion et de Participation pour la Coopération Économique (Proparco). Rural development banks, in India and Latin America for example, vary in their ability to take equity positions. Some of these institutions limit their exposure on equity as a matter of policy, e.g. the IFC to 20 percent of total equity, DEG to 49 percent.

Figure 3.2 Typical project finance configuration



For DFIs, factors influencing the attraction of the project have to do with not only the anticipated rate of return and risk profile, but also the question of “scale”. With high transaction costs in developing project concepts and arranging finance, smaller rural infrastructure projects are rarely viable, even if they offer reasonable returns. The high sunk costs on project preparation are simply prohibitive.

Partly because of these transaction costs, and partly as a result of the high inherent risks involved in agricultural infrastructure, an alternative strategy for DFIs and private equity firms is to take positions, not via SPVs, but in the corporate sponsor itself, whether fully private entity or public company. Currently, however, few institutions are taking equity in companies involved in infrastructure projects in low-income countries, let alone those aimed at the risky agricultural infrastructure sector. Part of the reason for this is that stringent criteria typically apply to investment decisions. For private and donor-backed private equity funds, these criteria include the requirement that companies should be already established, show market leadership and a competitive edge, and be able to demonstrate solid historic net earnings and significant growth opportunity⁵⁰. These high barriers to equity investment partly explain why, after a period in which it actively sold its positions in its “legacy” agricultural portfolio, the United Kingdom’s DFI – CDC Group – has waived these criteria and established the US\$75 million Actis Africa Agribusiness Fund for investments in agricultural projects, with expectations of relatively lower rates of return.

Long-term debt and guarantees

The long-term (7- to 20-year) nature of cost recovery for the capital costs of agricultural infrastructure projects raises commercial and political risks, making domestic debt financing difficult to ascertain. Typically, domestic commercial banks lend on maturities of up to three to five years, and may have little experience of assessing risks for infrastructure projects in the agricultural sector. Rural development banks, such as India's National Bank for Agriculture and Rural Development (NABARD), may lend on a longer-term basis through its function as a refinancing agency for other commercial and public financial institutions, but these terms are not common across the commercial financial sector. Government-backed regional rural banks generally act as credit institutions for the poor to improve productivity and do not have the capacity to provide long-term debt for infrastructure projects.

Multilateral and bilateral DFIs have stepped into this gap. Indeed, they have done so to such an extent that the supply of long-term debt for private infrastructure investments in some low-income countries now likely exceeds the demand⁵¹. For example, one estimate suggests that, in sub-Saharan Africa, excluding South Africa and Mauritius, demand for long-term debt for infrastructure projects is just US\$250–300 million per annum⁵², a figure well below the supply of debt-financing capabilities of the family of DFIs. To illustrate further, the donor-funded EAIF – a public-private partnership in its own right between donors and private banks – has capital of US\$300 million alone.

In low-income countries, the general problem, then, is not one of available debt finance, or even equity, but of bankable projects that make a viable return for their investors at rates competitive with the wider investment market. The mandates of DFIs require their institutions to mobilize private capital. This means that they essentially need to operate at, or very close to, market rates for equity returns, interest rates, fees and other charges. When adjusted for risks, in particular demand risks and regulatory risks, few infrastructure projects, especially infrastructure for agricultural development, are deemed bankable.

Even in low-middle income countries, key problems still remain. First, agricultural infrastructure projects that rely on user fees (irrigation, rural electricity, telecommunications), or on the outputs of smallholder or commercial farmers (crop processing, livestock and diary processing), all face the challenge of infrastructure coordination. Investments may need to be made in a strategic “sequence” of different infrastructure projects if the incentives for users to pay fees, or farmers to invest in increased productivity, are to be sufficient. For example, investment in a milk product processing facility may require concurrent investment in a network of collecting and refrigeration facilities across a region.

This need not be a disadvantage, as noted in the illustration of an integrated infrastructure project – ferry and road transport, power supply, water supply – on the island of Kalangala in Uganda (see Section 4.4.1). Indeed, it may actually open up opportunities to develop integrated or “bundled” infrastructure programmes that raise the overall value of the investment and diversify risks to an extent that allows the project to pass the minimum investment thresholds of potential lenders. An example might be combining rural feeder roads with agroprocessing, or irrigation with power generation and distribution. The success factor will be to single out bundles of infrastructure where the demand for one infrastructure service reinforces the demand for another⁵³. It is notable that the WB's largest single area of funding for its activities

under the PPIAF unit is for activities that explore private participation in two or more sectors of infrastructure (36 percent of PPIAF's 2006 portfolio in value terms)⁵⁴.

Second, as with low-income countries, the small-scale of transactions involved in most agricultural infrastructure projects – in the US\$1 to US\$30 million range – make it uneconomic for large-scale investors and many DFIs to undertake the necessary diligence and put together complex financing deals.

Third, user fees will most likely be in the local currency. Although some DFIs are able to hedge the related foreign exchange risk, such interest or currency swap markets do not exist for many currencies. This problem is more acute in low-income countries.

That there is a gap in the market for appropriate financing of infrastructure for agricultural markets in both low and low-middle income countries is illustrated by the recent review of the EAIIF (a donor-driven lender to the most risky markets). This review recommended that the Fund adopt “a wider interpretation of infrastructure to include production oriented infrastructure, especially in agriculture even when the latter has marginal or no third party-beneficiaries (i.e. no return on investment). The reason is that such development is critical in a continent lagging in economic growth, and economies largely dependent on primary production”⁵⁵.

The overriding concern seems to be that the way in which DFIs and international investors currently structure deals – looking for fully private projects and market returns, and at volumes that justify the sunk costs involved in project development – fits poorly with the high risks and low returns involved in agricultural infrastructure. In response to this, investors are beginning to experiment with a number of new or adapted financial instruments. Some of those that are proving particularly useful in supporting PSP in agricultural infrastructure are listed in Box 3.3.

Development finance institutions (DFI)

The role of DFIs in facilitating PSP in infrastructure in general is notable. The 15 principal multilateral and bilateral DFIs committed US\$7.5 billion to private sector investments in infrastructure in emerging countries in 2006⁵⁶. Despite this, a number of the shareholders of DFI equity have begun to question the mandates and operation policies of these institutions, and are asking what needs to change to increase investments in infrastructure, in particular in low-income countries and frontier areas and in types of infrastructure that might be more poor. The DFID and The Netherlands development finance institution FMO are two of the more vocal shareholders. Some of the issues raised include:

- Whether the high level of liquidity currently enjoyed by DFIs might be used to maintain a riskier portfolio of investments by offering more favourable lending terms, e.g. debt with longer maturities (important for infrastructure), subordinated debt, credit guarantees (to support local currency lending), or acting as “lender of record” for syndicated loans. Past experience suggests that DFIs might not be operating at their optimum level for risk taking. During the Asian financial crisis of the late 1990s, DFI portfolios were far riskier, loan losses higher and returns lower, and yet this poorer financial performance does not

Box 3.3 Financial instruments supportive of private sector involvement in agricultural infrastructure

- **Longer-term maturing debt** (7 to 20 years), needed because of the long periods for recovery of capital costs, provided either directly to private parties, or to financial intermediaries for on-lending.
- **Grace periods** on debt (from six months to two to three years).
- **Subordinated debt** that incorporates an option to convert to equity upon maturity. This can assist in raising the DSCR, a factor relevant to attracting lenders to finance infrastructure projects where user fee revenues may be particularly unpredictable.
- **A low debt equity ratio**, making the project more attractive to lenders.
- **Partial credit risk guarantees** provided by national or state rural development banks or DFIs to local banks to enable them to lend on a long-term basis. "Partial" because part of risk continues to be borne by the local bank.
- **Local currency partial credit risk guarantees:** In Ghana and other African countries, the IDA and the IFC are developing local currency partial credit risk guarantee programmes to encourage local banks to lend to small and medium-scale companies. GuarantoCo, part of the donor-supported PIDG, offers partial guarantees for debt to private infrastructure projects and companies, parastatals, public utilities and municipalities⁵⁷.
- **Partial credit risk guarantees with contingent loan support**, converting disbursements under a guarantee for defaults on payment obligations by a sovereign state (e.g. purchase agreement or user fee subsidy) into a loan to be repaid by the state to the guarantor. The IDA has such an indemnity agreement with the Government of Peru with regard to defaults on a subsidized toll road concession⁵⁸.
- **Sovereign partial guarantees** to cover late payments or defaults in purchasing/off-take agreements (e.g. for electricity to power irrigation works) or volatility in other major revenue streams (e.g. output by smallholders to agroprocessing facilities).
- **Export credit guarantees**, provisioned by donors for foreign investors, e.g. to guard against purchase agreements with public bodies.
- **Political risk insurance**, to manage unforeseen regulatory risks and the risk appropriation by the state.
- **Sub-sovereign lending** by rural development banks, DFIs or syndicates directly to municipalities or provincial/district authorities.
- **Bond markets** to overcome exchange rate risks and conversion restrictions in the domestic banking system, which is a constraint to hard currency financing of infrastructure projects.

- **Local currency bond markets:** some DFIs (the EBRD and IFC, for example) have exploited emerging local interest rate and currency swap markets by issuing bonds in local currency⁵⁹.
- **Municipal bonds markets:** USAID in the mid-1990s made efforts to mimic the success of municipal bonds issued by cities in the United States, to provide long-term investment for infrastructure. These have been predominantly focused on urban, not rural, infrastructure. The advantage of municipal bonds is that they provide for local currency concessional finance support investments into small-scale infrastructure projects. Examples include Indonesia, where the Government is seeking to transform Regional Development Accounts into separate, non-governmental facilities that sell bonds to raise capital for on-lending to local authorities. The Philippine Government has recommended a similar transition for its Municipal Development Fund, as has the Government of South Africa for its Local Authorities' Loan Funds and the Polish Government for its various national and regional environmental funds⁶⁰.
- **Pooled bonds:** local government authorities spreading the transaction costs and diversifying the credit risks of bond issuances through pooling with other authorities. In India, Tamil Nadu's Municipal Urban Development Fund issued pooled bonds for water projects. In this case USAID's Development Credit Authority (DCA) provided a credit risk guarantee for 50 percent of the funds.
- **Private equity:** a number of DFIs, as well as some fully private equity firms, take interests in established companies that are involved in infrastructure development in developing and emerging countries (mostly power and telecommunications). One exception is the Aureos Capital Fund. Partially supported by the United Kingdom Government's CDC Group with 14 percent of the total Fund's total committed capital (of US\$570 million), the Fund invests in Central America, Asia and Africa. One of its 22 managed funds – the Acacia Fund – has equity in Brockside Dairy Limited, the largest milk processor in Kenya⁶¹.
- **Venture capital:** private equity firms especially focused on start-ups and early stage development⁶².

seem to have adversely affected the institutional credit ratings and therefore their cost of borrowing relative to commercial financial institutions.

- Whether DFIs need to adapt their mandates or adopt new operational policy to purposefully relax the expected returns on debt for infrastructure projects, especially for infrastructure that improves agricultural productivity. The aforementioned CDC Group "Actis Africa Agribusiness Fund" is one example, and the recommendations on revisions to the mandate for the EAIF another.
- Greater transparency and marketing of the wide range of donor technical assistance funds available for project development by both the public and private sector.

Local currency

Private companies needing to raise funds to construct, rehabilitate or operate agricultural infrastructure are at risk if they raise this finance in foreign currencies. Foreign exchange rate risks are problematic and expensive to insure against. With revenues for agricultural infrastructure (user fees or purchase agreements) invariably in local currency, private sector participants in PPPs are faced with a number of financing options: (i) take out local currency debt financing from local banks, with third-party partial risk guarantees to improve lending terms; (ii) borrow from international lenders (e.g. DFIs) who are able to enter into risk management “swaps”, which allow hedging of fluctuations in exchange rates; or (iii) seek corporate “structured” finance by leveraging new debt in local currency on the strength of the companies entire balance sheet and then providing this to the SPV.

Regarding hedging, as noted earlier, few low-income countries have active local currency “swap” markets. For example the IFC can offer debt hedged against exchange rate risk only for Kenyan shilling, Ghanaian cedi, Indian rupee, Nigerian naira, Pakistan rupee and the Ugandan shilling⁶³. However, it can also offer debt in currencies for other developing countries where swap markets do exist, such as the South African rand, Brazilian real, Indonesian rupiah and Romanian lei. These currencies may fluctuate less widely against neighbouring currencies without swap markets, thus providing opportunities for on-lending across borders.

3.2.3 Subsidies in Public-Private Partnership financing of agricultural infrastructure

An overview of subsidies in PPPs relevant to infrastructure for agricultural development follows.

Rules of thumb on subsidies

Box 3.4 provides some common rules of thumb for subsidies in PPP infrastructure projects.

Performance-based subsidies

Linking subsidy payments to private sector performance is one way to ensure subsidies are efficient. For example, for rural roads performance-based maintenance and management contracts linked to the disbursements of subsidies mark a departure from previous quantity-oriented works contracts. Their aim is to achieve minimum service quality levels, measured in terms of outcome indicators, such as “minimum year-round access” or “minimum hours of blockage during the rainy season”, or “ability to travel at a minimum average speed of 50 or 80 km per hour”. The idea is to shift the prime objective of the contract with the private parties away from the mere creation and maintenance of assets, towards achievement of service levels.

The same performance-based approach is built into the use of grant co-financing by a number of donors. For example, the IFC recently designated resources from its retained earnings to provide subsidies to improve the financial structure of private-sector projects under the GPOBA programme (see Box 3.5). More creatively, FMO, through its Development-Related Export Transactions Programme (ORET) and the Least Developed Country (LDC) Infrastructure Fund, is able to combine development finance with grants and low-cost loans directed at infrastructure.

Box 3.4 Rule of thumb on good subsidy practice⁶⁴

- Private service providers should invest and risk a material portion of their own resources to set up the facilities and provide the services during a given time under specified conditions, both for construction and operational phases.
- Subsidies should be targeted to reduce access barriers to which low-income or other specified groups are especially sensitive, such as initial connection, equipment or installation charges for irrigation or telecommunications in remote areas. Such targeting can be strengthened by tying disbursements of the subsidy to output-based performance criteria.
- Subsidies should encourage parallel infrastructure development for reasons of equity and reduce the political risks of higher paying customers accessing new infrastructure ahead of those on lower incomes.
- Subsidies should be predominantly aimed at capital costs, with the aim of (i) shortening the period of high risk cost recovery, and (ii) ensuring linkage between payment by customers and quality of service they receive.
- Subsidies to meet operating and maintenance costs should be on an exceptional basis and highly targeted to the poorest. Providing a fixed level of user or tariff subsidy over the duration of the lease or concession may act as a disincentive to increased efficiency. Tapering user subsidies out over time is one way to counter this.

Exceptions to these rules clearly apply for road infrastructure and other infrastructure if there are no prospects of user fees from private customers.

Box 3.5 Global partnership on output-based aid⁶⁵

The GPOBA is a multi-donor trust facility to fund and demonstrate output-based aid (OBA) approaches – the use of explicit performance-based user fee subsidies in the delivery of basic services (water, electricity, telecommunications, transportation, health and education). The GPOBA resources are applied to financing studies intended to pilot the application of OBA approaches; and to the financing of output-based payments for services under OBA schemes. Funds are open to general applications from other international finance institutions, bilateral donors, NGOs, public bodies and private infrastructure providers, governments and the WB. Eligibility criteria for funds under the GPOBA initiative include the following:⁶⁶ (i) operating performance risk transferred under contract to the operator at a reasonable rate of return; (ii) subsidies designed at a minimum level to assure viable and sustainable project economics; and (iii) the subsidy term (for transition subsidies) not to exceed seven years.

To date, there are 66 active projects under the GPOBA, with subsidies totalling US\$156 million. To illustrate the initiative, US\$2.35 million was recently granted to support the Government of Lao People's Democratic Republic in the provision of safe drinking water to 21 500 households in 21 district towns using local/regional private operators. The purpose of the output-based subsidy is to reduce the required investment costs that will need to be recovered directly from poor users through connection fees or through the tariff, thereby giving greater access to water services to the poor.⁶⁷

Sources of subsidy

The source of subsidy can vary. Options include:

- “Ear-marked” donor budget or sector wide approaches support, donor trust funds, and DFI performance-based funds, e.g. the GPOBA in Box 3.5 above.
- National public investment budgets or ministerial or provincial public investment budgets, offering secure long-term recurrent public expenditure commitments. This could comprise grant subsidy/co-financing, concessional loans to the private sector, “lease-back” arrangements on privately financed infrastructure, long-term commitments to pay “shadow” user fees, etc.
- Levy on revenues or profits of existing operators operations, e.g. the Indian USOF.
- License fees charged to existing operators of established operations.
- Municipal development funds (MDFs) – parastatal institutions, sometimes donor supported, providing credit or grants to local governments and to other institutions to invest in local infrastructure (concessional loans sometimes targeted at those local authorities capable of selling bonds). The MDFs typically reach more local authorities and smaller investment projects than it would be efficient for international institutions to try to do directly.

Least-cost subsidy competitions

Subsidies for rural and agricultural infrastructure services are increasingly being determined and allocated through competition. Competition, or auction, among firms for subsidies to provide infrastructure services in rural areas was pioneered by Chile in the mid-1990s for payphone programmes⁶⁸, and has since spread to Peru, Guatemala, Colombia, Bolivia, Ghana, Nepal, Nicaragua and Uganda. Chile and Colombia are trying a similar approach to support public access to the Internet. Box 3.6 summarizes the main steps in the practice of competition for subsidies.

The different levels of subsidy for different infrastructure types and locations can be stark. For example, for rural payphone programmes based on least-cost subsidy competitions in Latin America, the level of subsidy as a proportion of private sector investment ranges from 17 percent in Chile to 33 percent in Guatemala and 50 percent in Peru⁶⁹. In a series of 12 small urban municipalities in Colombia, subsidies covered over 70 percent of total investment⁷⁰.

Regarding improvements in the role of road infrastructure in agricultural development, another form of subsidy is to offer grants or concessional finance to private owners of transportation services who use the road infrastructure. Most relevant to agriculture would be firms that provide trucks for hire, traders and trading firms, and individual farmers or cooperatives that share transportation. Others include private firms, parastatals and NGOs that provide services that bring agricultural and farm inputs to agricultural areas and/or provide extension services. Current transportation services are frequently unreliable and expensive in many low-income areas. As far as can be ascertained, competition among agriculture-related

Box 3.6 Steps in the practice of competition among firms for subsidies for rural infrastructure⁷¹

- Government defines the broad objectives, target population and levels of funding of the subsidy programme.
- Government defines key service specifications: type of service, quality standards, pricing, duration of commitments.
- Specific service needs and choices are primarily identified by prospective infrastructure users.
- Economic and technical analysis is used to select and prioritize projects that are likely to be desirable from the viewpoint of the economy at large but not commercially viable on their own, and to determine the maximum subsidy justified for each project.
- Private firms submit competitive bids for these projects. Subject to meeting service conditions and complying with rules that apply to all providers, bidders are free to develop their business strategies including choice of technology.
- Subsidies are awarded to the bidders that require the lowest one-time subsidies. Alternatively, bids are invited for fixed subsidies and awarded against other quantifiable service measures, such as the lowest price to end users or the fastest rollout of service.
- Subsidies are paid in full or in instalments, linked to implementation of investments and start of service.
- Service providers own the facilities and bear all construction and commercial risks.
- No additional subsidies are available downstream for the same services.
- Government monitors and enforces service quality and pricing standards, protects users against arbitrary changes of service and provides investors with stable rules of the game.

transportation services operators for subsidies has not yet been attempted in any developing country⁷².

Private finance initiatives (PFIs)

A special category of infrastructure subsidy is what in the United Kingdom is called the PFI. In the PFI model of PPPs, the public sector is transformed from the owner and operator of public services to the purchaser of services. Instead of owning the infrastructure (other than the land) the public authority exercises a “lease-back” option or pays “user fees” for use of the asset for public service provision. Usually a PFI project will be owned by a SPV. These companies forming the SPV commonly comprise an engineering company (if capital projects are involved), commercial banks and a facilities management company. While PFI projects can be structured in different ways, the Design, Finance, Build and Operate (DFBO) formula is fairly common. Some of the key principles for success in PFIs are given in Box 3.7⁷³.

Applying the concepts of PFI to high-risk rural and agricultural infrastructure in developing countries could carry some advantages. These include spreading the cost of capital investments in public infrastructure over time (with the government effectively taking out a repayment mortgage with the private sector) and shifting the risks of capital cost overruns and operational revenue deficits from poor maintenance to the private sector.

Box 3.7 Principles for success in Private Finance Initiative infrastructure projects

- Public authorities retain responsibility and accountability for deciding among competing objectives; choosing the aims of service provision; setting standards, criteria and performance targets; and safeguarding the broader public interest.
- A skilled public sector PFI team and dedicated “project owner” able to:
 - develop the outline business case;
 - manage a complex competitive procurement process;
 - assess VFM of bids and proposals, e.g. against a public sector benchmark (e.g. the Public Sector Comparator);
 - assess the allocation and quantification of risks in the various bids;
 - draft output/outcome specifications and payment mechanisms;
 - negotiate on a level playing field with the private sector;
 - assess detailed solutions and designs.
- A procurement process that involves a period of “competitive dialogue” for the preferred bidders.
- Private entities that bring expertise and innovation in financial and performance management.
- Efficiency savings and improved performance by linking design, financing, construction, operation and maintenance.
- An emphasis on the link between outputs and outcomes, i.e. how the outputs will enable the objectives of the service to be achieved.
- Political will and popular support.
- Risks to be transferred to the private sectors properly priced.
- The shortest possible payback for capital investments, so that equity investors can “exit” early, and the financing arrangement shift to a lower risk model based on linking user fees (or leasing charges) and subsidies to operations and maintenance commitments.
- Compensation to the private entity for the increase in regulatory and political risks over time.

Given the institutional complexity of PFI bidding and negotiations, translating PFI into a rural infrastructure context in developing countries would need close attention to the first principle in Box 3.7 above (namely retaining strategic decision planning), as well as building PFI project development, negotiation and management skills within public bodies. Attention would also need to be given to the last two principles: the need for a short capital cost recovery period (to avoid expensive long-term debt servicing risks), and providing adequate compensation for the remaining longer-term political and regulatory risks.

Criticisms of PFI are many, especially by workers unions⁷⁴. These include:

- The underlying motivation for PFI being to keep public borrowing for infrastructure “off” the public sector balance sheet;

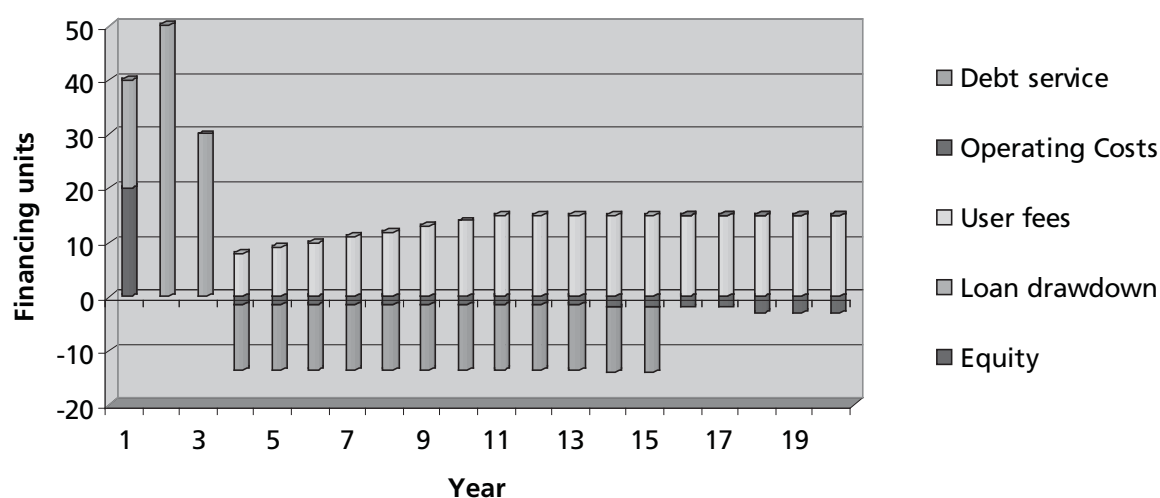
- Higher eventual costs of PFIs than provision by the public sector, because of higher rates of borrowing for private sector and higher set-up costs, resulting from protracted negotiations (rolled-up transaction costs are an average of 4 percent of the capital value for hospital PFIs in the United Kingdom⁷⁵ and take 18 to 24 months to reach the stage of contract signing⁷⁶);
- Few private companies being able or willing to enter into PFI bids, and thus the competitive aspect of procurement is lost, with the deal becoming gradually less favourable to the public sector⁷⁷;
- Price escalation over the course of a PFI contract (including risks gradually being transferred back to the public sector), leading to increases in public subsidies.

An interesting recent development in PFIs is the use of *shadow user fees* (or consumption-based subsidy). Here, the government does not lease the asset, but pays a per-user fee based on performance standards. In effect, this is a form of output-based performance subsidy. If fewer users access the infrastructure than predicted, owing to a poorly maintained road surface, for example, then the private entity is penalized with lower revenues. Likewise, if users are more than expected, revenues rise. The measure transfers the risk of volume and demand risk to the private entity. However, this carries implications for the predictability of public finances, and thus undermines one of the original benefits of PFI.

3.2.4 Financial scenarios in Public-Private Partnerships (PPPs)

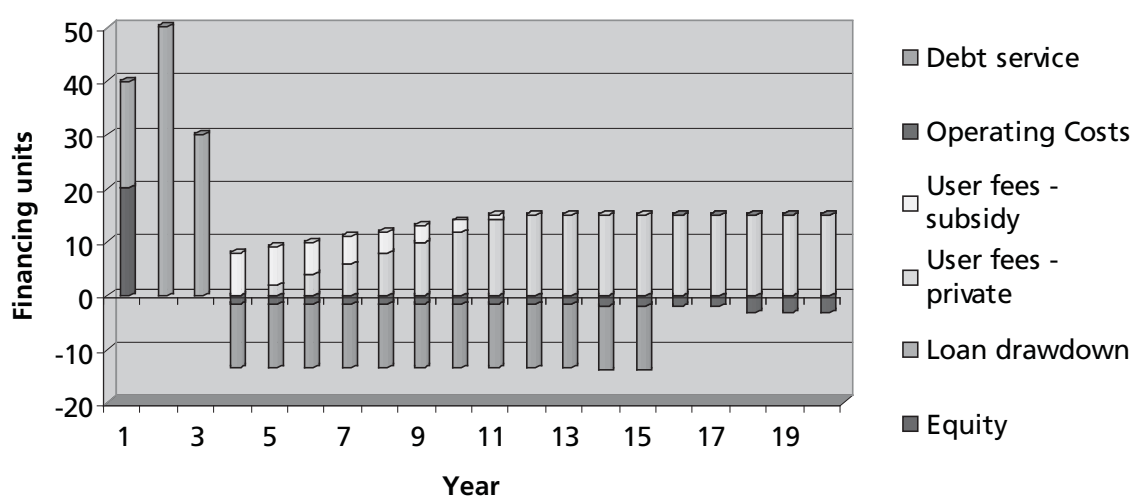
Computer-based financial models are available that assist private sector parties in the analysis of how to best formulate financial arrangements for PPPs. These generally cover different financing scenarios, calculating expected cash flows and returns and testing the sensitivities to changes in project design⁷⁸. Some typical PPP financing scenarios are shown below, reflecting different levels of PSP and public subsidy.

Figure 3.3 Fully private financed PPP (e.g. agroprocessing land concession)



As might be the case for a BOOT (build-operate-own-transfer) agroprocessing facility on a government land, or a rural power project with a long-term public sector purchasing agreement, in this financing scenario equity is provided by the private sector at a ratio to debt of 1:5. Debt servicing is spread over 13 years, with a three-year grace period. User fees rise gradually in the first few years as the infrastructure slowly reaches full capacity. Most of the profit and dividends are made in the final few years, although operational costs also rise in this period to cover higher maintenance costs and/or the replacement of certain capital assets that had not been fully depreciated (a not uncommon occurrence).

Figure 3.4 Tapered operational subsidy (e.g. irrigation works or remote mobile communications)



In this model, the government (or donor or DFI) provides an annual operational subsidy for the first few years, as might be the case for irrigation infrastructure or rolling out mobile network telecommunications to the most remote agricultural areas. The subsidy is tapered to encourage the private operator to become more efficient and/or to expand their user base until it breaks even.

Figure 3.5 illustrates what happens if private user fees are replaced by a regular government subsidy, and linked to some type of performance criteria, for example, “shadow” user fees paid to road operators based on vehicle volumes. In this case a portion of the annual payments by government also includes repayment of capital costs incurred by the private sector.

Figure 3.6 assumes a 50 percent capital grant, as might be required to attract private investors to construct telecommunication relay stations via a least-cost subsidy auction.

Figure 3.7 assumes a project where lenders decline to invest in the capital works because of the high risks or because user fees would be unable to support debt repayments. In this case, user fees are sufficient only to cover the operation and maintenance of the facility and possibly to enable replacement of certain fixed assets in the latter years of the lease agreement or concession.

Figure 3.5 Combined annual capital and shadow user fee subsidy (e.g. road construction and operations)

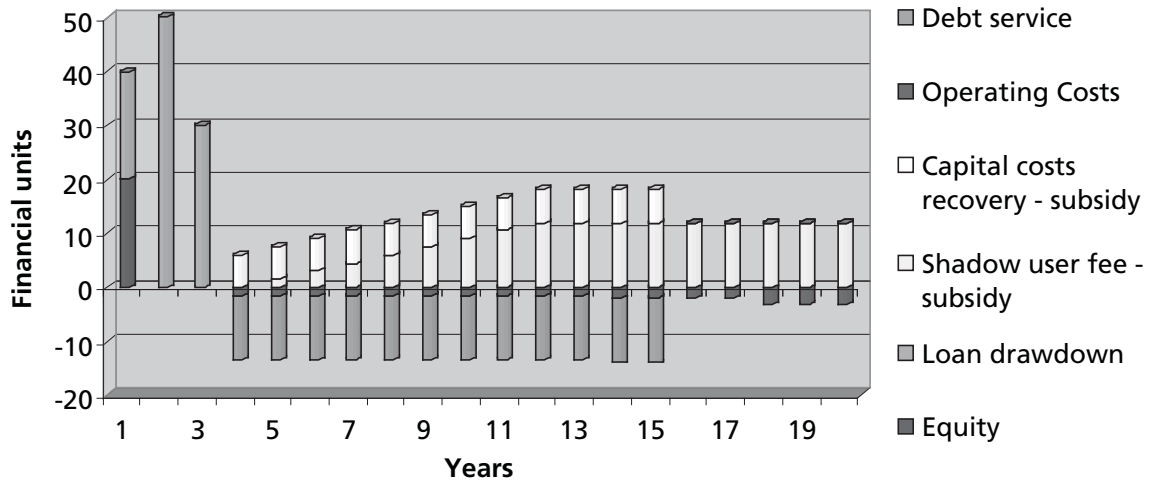


Figure 3.6 One-time partial capital subsidy (e.g. rural telecommunications infrastructure)

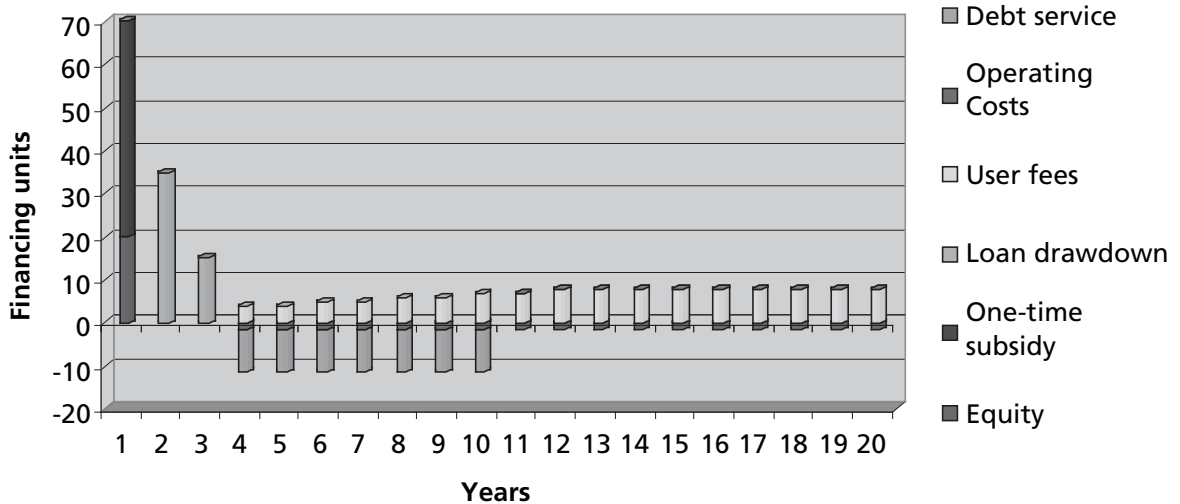


Figure 3.7 One-time 100 percent government capital subsidy (e.g. wholesale market)

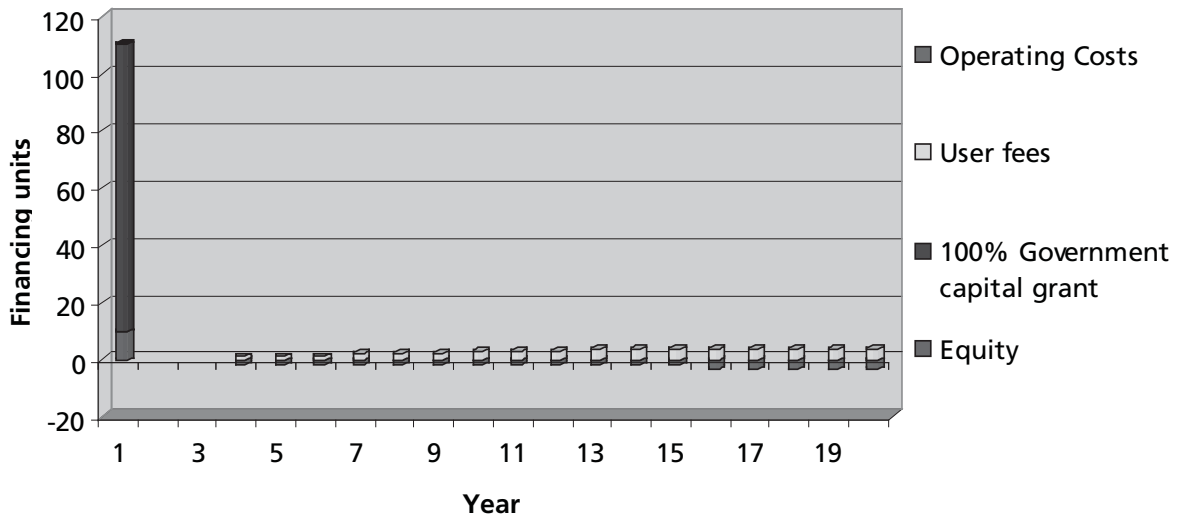
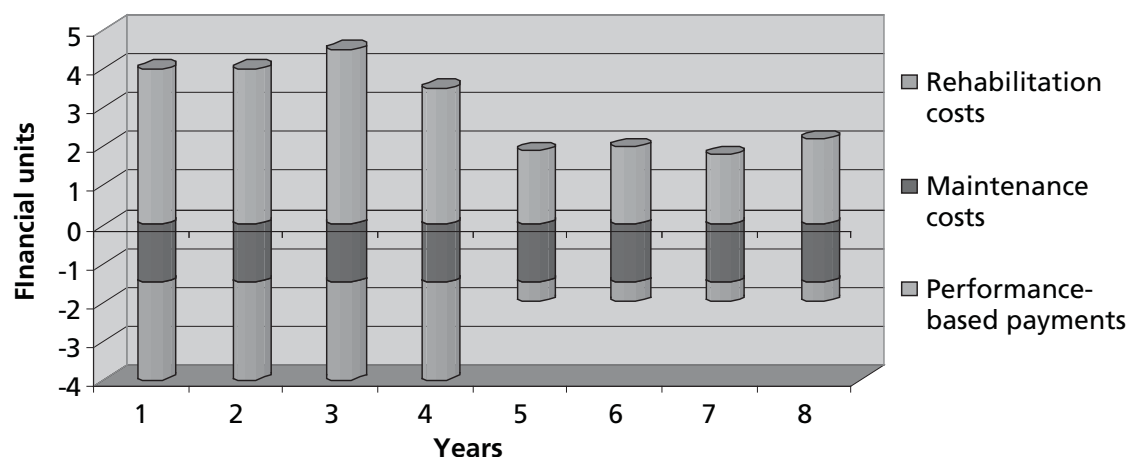


Figure 3.8 below shows a simplified arrangement for a performance-based management contract, for example, as might be in place for private sector operators who are rehabilitating and maintaining roads.

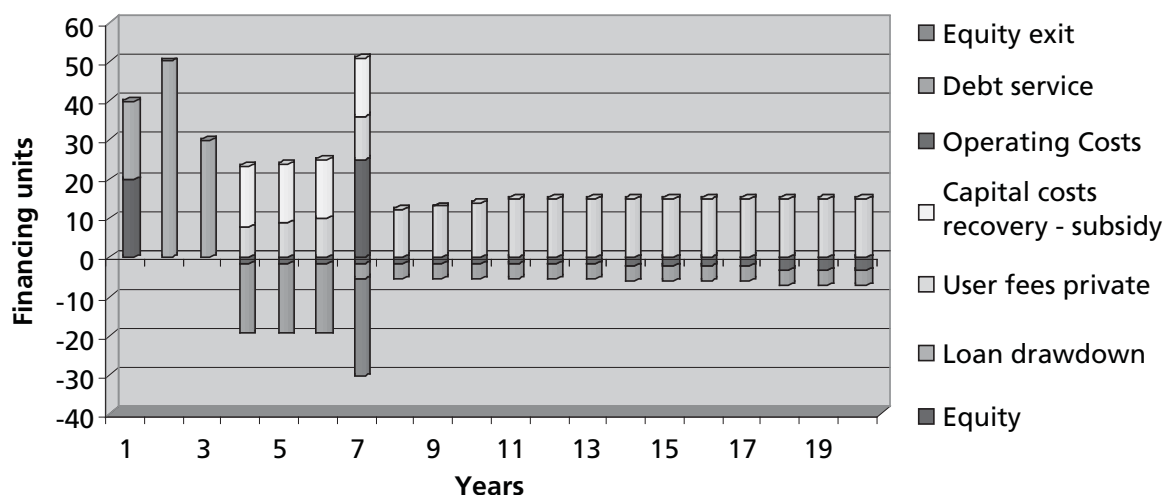
Figure 3.8 Performance-based management contract (e.g. road maintenance and rehabilitation)



3.2.5 Sequencing financial instruments

The right sequencing of different private and public financing options can also play their part. The World Economic Forum, for example, recommends that the financial design of PPPs should include a focus on how different public and private entities might change or “upgrade” from one instrument to another over time⁷⁹. For agricultural-oriented infrastructure in frontier areas, shortening the risks associated with repayment of capital is critical to attracting private finance. Figure 3.9 shows how government (or donor) capital subsidies can be used to shorten the repayment period of the initial fixed capital investments (for example in irrigation works). This then enables the SPV to be refinanced with cheaper long-term debt, i.e. now that the risks associated with establishing the fixed assets are removed, risk premiums are able to be adjusted downwards to reflect only operational issues, such as the predictability of user demand.

Figure 3.9 Refinancing following construction (e.g. irrigation works)



3.2.6 Cost recovery

Achieving a reliable source of revenue to cover expenditure on capital assets and/or operations and maintenance is a key factor in attracting the private sector: operators, equity investors and commercial lenders alike. Cost recovery via user fees is one option, and although some argue that this is often the only viable way to generate the necessary reliability of revenues and incentives to cover capital and operational costs assumed by the private sector⁸⁰, there are also other options, as listed below.

User fees

- One-off upfront connection or access charges to customers;
- Private customer, unit-based, user fee (e.g. toll, tariff);
- Private customer periodic payments (annual or quarterly), e.g. rent, license fee;
- Public sector user fee payments, e.g. lease payments;
- Shadow user fees, tied to changes in demand and frequently linked to performance criteria;
- Tax credits to users, similar to “food stamps”.

Government subsidies

- Public sector subsidies for capital and operational and maintenance expenditure;
- Grants for infrastructure upgrades or for accessing particularly vulnerable or remote populations;
- Increase in general levy on user tax-base, most likely a locally raised tax, which can then be recycled back to the private sector operator as a subsidy or user fee.

Indirect revenue streams

- Under a concession arrangement the private sector is granted rights to:
 - sell part of the infrastructure for profit, or
 - sell concession land that has accrued in value as a result of the infrastructure (e.g. upgrading of a road network) and take a portion of the profits;
- Assume income from advertising;
- Operate private subsidiary services using parts of the same infrastructure, e.g. bus transportation as part of road development;
- Take a share of the value from another private operators/owners further down the value chain – “retention value” – e.g. from private agroprocessors.

The Nakhlet small-scale irrigation scheme in Mauritania described in Section 5.1.1 illustrates the range of cost recovery instrument available to private parties within a single PPP arrangement. This includes: variable user fee payments by farmers to intermediary private WUAs for agricultural inputs; separate consumption-based irrigation charges to support the operations and equipment maintenance activities of the WUAs; and fixed subscription payments by water users to enable servicing of WUA credit lines.

3.2.7 Value for money (VFM)

The VFM argument underpins much of the debate on whether PPPs are a better alternative than infrastructure developed by the state. VFM for the public sector can be defined as “realizing the lowest out-turn cost over the whole life of the contract”⁸¹. To demonstrate VFM it is first necessary to develop a Public Sector Comparator (PSC), or equivalent. This is an economic valuation based on a similar publicly funded project from the past that would serve as a benchmark for the proposed PPP, including cost overruns, liabilities and environmental damage. The PSC must be expressed in net present value and include the full cost of providing the required infrastructure to a specification, as well as fully accounting for all risks that would be encountered, both those transferred to the private sector (mainly commercial risks) and those retained by the public sector (such as certain regulatory risks)⁸².

For the proposed PPP project to be considered VFM, the full turn-out cost of the relevant service should be lower than for the same service provided by the public sector, allowing for differences in quality of services, price, time frame and risk. One problem is that, although a PPP proposal may meet the VFM criteria from a state budget perspective (i.e. be a better full turn-out investment than the PSC), from the infrastructure-user perspective the case may well be weaker, with user fees escalating at a rate sufficient to cover the now exposed risks of cost overruns and environmental damage. Under a fully public funded and executed infrastructure project, these overruns or environmental damage would have been born by the state by drawing on the general tax base. By including them in the PSC, the private sector option may look more attractive than the public, even if the cost of borrowing for the private sector is higher and revenues have to generate a profit margin and pay dividends.

New techniques are being developed for the VFM formula to take account of both exogenous costs, and the infrastructure end-users perspective. The IFC recently surveyed a number of its investment projects and concluded ways to help improve the overall VFM of PPP projects, including⁸³:

- VFM calculations that reward the “lowest upfront cash alternative” for capital investment, even if this is not necessarily the largest NPV or the most elegant solution;
- Rewarding infrastructure proposals that “fix problems fast” and schemes that eliminate bottlenecks (thus reducing demand risk and reducing the cost of long-term debt), rather than looking for long-term solutions;
- Adopting a “Vietnamese” approach to capital investment, i.e. a focus on intermediate technology that is proven in the local environment, rather than higher risk technology proven only in developed economies⁸⁴, and reutilizing and rehabilitating existing infrastructure, resources and equipment rather than undertaking new investments and acquisitions.

3.3 DIVISION OF RISK

The risks for both the public and private sectors investing in agricultural infrastructure are many and diverse. Box 3.8 catalogues some of these⁸⁵, divided into risks relating to the construction of capital assets, service delivery, market factors, and economic and political risks.

Box 3.8 Risks to investment in infrastructure for agricultural development

Construction of capital assets

- Design risks (private party's design may not achieve the required specification);
- Regulatory delays;
- Financing delays, e.g. to complexity of financial package to manage risks;
- Delays in mobilizing materials and men into remote rural areas;
- Completion risk;
- Cost overruns, e.g. owing to weather;
- Utilities risk – the risk that required public utilities and services (e.g. electricity for irrigation, or rural feeder roads for an agroprocessing facility) are not sequenced in sufficient time.

Operational phase (service delivery)

- Latent defect risk, important for the upgrading of existing infrastructure;
- Poor technology and equipment performance;
- Input unavailability, worsened in remote rural areas caused by transportation constraints;
- Management quality deficiencies;
- Cash flow risks;
- Debt service risks;
- Extended maintenance downtimes/unplanned stoppages, leading to complaints from customers and reduced user fees.

Market factors

- Insufficient or volatile demand;
- Over demand – infrastructure unable to meet demand, creating dissatisfied customers, congestion (e.g. on transportation routes and approach roads to agrofacilities);
- Late payments by users;
- Non-payment by users.

Economic risks

- Credit risks, i.e. risk of non-payment by borrower to lenders;
- Unavailability of affordable short-term financing (working capital);
- Fluctuations in interest rate on debt;
- Currency convertibility and foreign exchange rate change (e.g. devaluation), relevant if hard currency financed;
- Inflation in construction or operational costs not matched by inflation in user fees or subsidies, particularly relevant if investments concentrated in the same geographic region at the same time.

Political risks

- Regulatory and contractual risks, including breach of contract, changes in law, license requirements, approvals and consent not obtained or result in additional costs, imposed changes in tariffs, different rules for foreigners, restrictions on operations, obstruction in the process of arbitration;
- Expropriation, nationalization or confiscation of privately owned assets, with a "pittance" payment;
- Non-neutrality of legal system, including dispute resolution;
- Political "cross-fire" risks, e.g. anti-privatization of water and electricity;
- Local public hostility, e.g. tariff rates, social or environmental impacts;
- War and civil disturbance.

3.3.1 Risk transfer to the private sector

The commercial and political risk profile of agricultural infrastructure projects is a key constraint to participation by the private sector. These risks are likely higher the more remote the location, the lower the population density and incomes, the more inefficient or politically fragile the government institutions, and the less well developed the local capital markets and infrastructure supplier sector.

The risk profile is different for different types of rural infrastructure. On balance, mobile network telecommunications may be comparatively less risky, with lower capital and maintenance costs, a willingness of users to pay for cost recovery, and shorter time periods to turning a profit. Irrigation works for smallholders, covered wholesale markets and telecommunication base and relay stations have high capital costs and thus require prolonged periods of cost recovery, increasing the commercial risks.

3.3.2 Risk mitigation

A critical challenge for the state and donors is to find risk mitigation strategies, financial or non-financial, that increase the “appetite” of the private sector to take on commercial and political risks over a sustained period. Two of the examples discussed in later sections of this report offer a contrast in risk mitigation options. The commercial viability of the Siongiroi Dairy Plant PPP in Kenya (see Section 7.1.1) is challenged by seasonal climatic uncertainty. To mitigate this risk and attract the private sector, the state provided an initial capital grant subsidy to attract private investment in the milk processing facility. This had the effect of reducing the borrowing requirements of the plant company, while concurrently transferring the risk of servicing the remaining capital debt to this private party. Arguably, such residual risk transfer incentivizes Siongiroi Dairy Plant Ltd to maintain a strong focus on cost efficiency and performance.

In contrast, in the Nile West Delta Irrigation Project (Section 5.2.1), no capital grant subsidies were forthcoming. Instead, 85 percent of project capital costs were drawn from a concessional WB loan to the Egyptian State, and made available to the project operator. In return for avoiding an upfront public expenditure commitment (a grant to the project operator, for example), the state has thus taken on the main credit risk, as well as possibly an elevated political risk because the private party is less incentivized to achieve cost efficiencies and performance levels.

These two examples illustrate the choice of public sector concession planners between capital subsidies and credit risk retention, and invite the question of how the state can simultaneously attract the private sector into high-risk agricultural infrastructure projects, and yet also incentivize them to achieve cost efficiencies and high levels of service quality. These choices are discussed in more detail in Section 5.2.3.

Table 3.1 provides a generalized division of risks between private and public entities for business services and local infrastructure PPPs, based on an European Union (EU) Phare programme in Bulgaria⁸⁶. The literature offers a range of financial and non-financial risk mitigation instruments relevant to PPP projects (see Table 3.2).

Table 3.1 Generalized allocation of risks between public and private entities⁸⁷

Risk	Public partner	Private partner	External to PPP
Income	Monitor	Assume risk	
Partner choice	Assume risk/Monitor	N/A	
Construction	Monitor	Assume risk	
Operating	Monitor	Assume risk	
Financial	Monitor	Assume risk	
Regulatory	Assume risk	N/A	National legislation
Political	N/A	N/A	National government
Environmental	Risk prior to contract	Risk post-contract	
Asset/Latent defect	Monitor	Assume risk	
Public acceptance	Assume risk	Assume risk	
Sustainability	Monitor/regulate	Assume risk	Consumer regulatory body

Table 3.2 PPP risk mitigation instruments for attracting private parties into PPPs⁸⁸

Risks	Financial risk mitigation instruments	Non-financial risk mitigation instruments
Political risk	Political risk insurance cover, either specific or in a credit guarantee, e.g. B loans made by multilateral institutions	Civil society organizations directly involved in the PPP design, construction and/or service delivery and operations
Credit risk	Partial credit guarantees (PCGs), partial loan guarantees First-loss PCG, designed to raise credits to "investment-grade"	Joint ventures with local supplier firms
Devaluation risk	Use of local currency finance Local currency guarantees Devaluation liquidity schemes and facilities	
Commercial risks	PCGs	Short-term capital cost recovery Financing strategies Subsidized user fees Output-driven performance standards
Regulatory and contractual risks	Breach of contract cover	Financing and risk financing from multi-lateral development banks

3.3.3 Parameters of risk mitigation

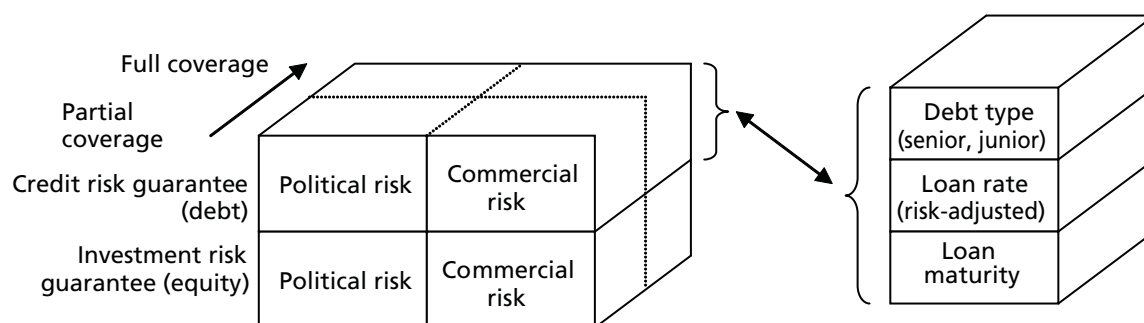
A number of key parameters define the characteristics of risk mitigation instruments, as follows⁸⁹.

- **Beneficiary** – the party who signs a guarantee or insurance contract with the third-party provider. The beneficiary may be the project sponsor; or a debt provider (e.g. a lender or bond investor concerned with the credit risk of the borrower, and wanting coverage against debt service default losses); or an equity investor desiring protection against investment risk and wanting coverage for investments made, or equity returns.

- Risk type covered – essentially, there are two types of risk coverage: commercial risk and political risk. Both forms are relevant to guaranteeing against defaults on the repayment of debt (credit risk) and on losses in the value or anticipated returns on investments (investment risk). Some risk mitigation instruments look at the “cause” of the default on debt servicing or investment losses, such as a commercial risk event (e.g. cost overrun) or a political risk event (e.g. social disturbance). Other instruments focus on the “consequence” of the risk event (e.g. the resulting fall in cash flow, or failure to meet final principal “bullet” payment or last few principal and interest payments), irrespective of the cause. The partial credit risk guarantees offered by DFIs such as the IFC are a case in point.
- *Export credit guarantees* – a special case of partial credit risk guarantees, designed to cover losses for exporters or lenders financing projects tied to the export of goods and services from the home country. Export credit guarantees or insurance cover some percentages of both political risk and commercial risk (together termed comprehensive risk guarantee or insurance).
- Extent of risk coverage – some instruments cover only a portion of the total debt service default or investment loss. The aim of partial risk coverage is to promote risk sharing between the third-party guarantor or insurer and the lender, equity holder or project sponsor. For example, risk sharing between the guarantor and the lender may be 50/50, or biased towards one or other parties up to a certain threshold.
- Interaction between second and third party risk mitigation – the high risks and low investment returns associated with many forms of agriculture-oriented infrastructure means that lenders will seek to mitigate against these through higher interest rates and shortened maturities; 200–500 basis points above the base lending rate are not uncommon for such projects. DFIs that offer longer maturities or “junior” debt may elevate their loan rates even higher in compensation. What third-party risk guarantees and insurance do is to improve both the borrower’s access to the financial markets and the terms of its commercial debt, i.e. the interest rate and length of maturity.

The key parameters of risk coverage are summarized in Figure 3.10

Figure 3.10 Key parameters of risk coverage⁹⁰



3.4 CONTRACTUAL ARRANGEMENTS

The form of contract agreed between the public and private party to facilitate development or operation of infrastructure will be influenced by at least three factors: (i) the level and types of risks (the higher the risks, the less likely the private sector will invest in building long-term assets, and the more inclined they will be to enter lower-risk lease, management or service contracts); (ii) the level of user demand (the higher the required volumes of capital investment and the lower the user demand, the greater the need for long-term agreements in order to realize a return on investment, such as Build-Operate-Transfer (BOT) contracts; and (iii) the extent of public subsidy (the higher the level of subsidy, the more readily the private sector will invest its own resources, or leverage resources from lenders, and thus the more willing to entertain higher risk concession agreements).

3.4.1 Allocation of responsibilities

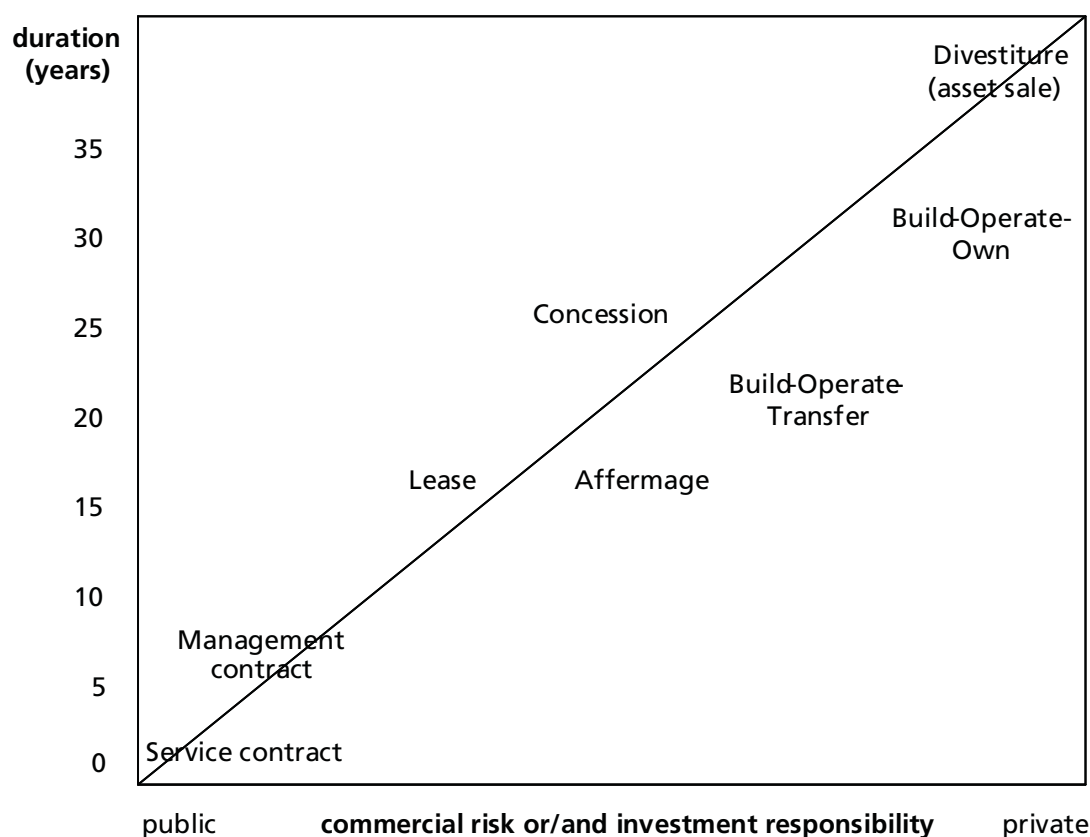
As noted, some jurisdictions have dedicated legislation to realize PPP projects and investments. In other regimes, the legal status of the PPP will be largely defined by the type of contractual (or voluntary arrangement) they agree to abide by, and the obligations and liabilities that these arrangements carry. The main legal distinctions among different PPP approaches are how responsibility is allocated across the following facets:

- Ownership of assets;
- Source of capital investment;
- Responsibility of operations and maintenance (service delivery);
- Acceptance of commercial and political risks;
- Contract duration;
- Financing and payment mechanisms.

Table 3.3 shows how responsibilities are allocated for different types of contractual arrangements. Figure 3.11 illustrates how the form of PPP contract needs to change with the duration and level of commercial risk and investment responsibility.

Table 3.3 Contractual forms of PPP and the allocation of responsibilities⁹¹

Contract form	Asset ownership	Operations and maintenance	Capital investment	Commercial risk	Contract duration
Service contract	Public	Public/Private	Public	Public	1–2 years
Management contract	Public	Private	Public	Public	3–5 years
Lease agreement	Public	Private	Public	Shared	8–15 years
Concession	Public and Private	Private	Private	Private	20–30 years
BOT	Public and Private	Private	Private	Private	2–30 years
Divestiture	Private or Public and Private	Private	Private	Private	Indefinite or limited by license

Figure 3.11 Contractual forms against duration and levels of risk and investment⁹²

3.4.2 Contractual definitions

PPP contracts and informal arrangements take many forms. Those particularly relevant to agricultural infrastructure under PPP arrangements are summarized below⁹³. Figure 3.12 shows how these different contractual forms are linked to the main activities in infrastructure development.

Build-Operate-Transfer (BOT)

BOT contracts are designed to bring private investment into the construction of new plants and infrastructure facilities. This is a scheme where governments contract turn-key projects to private companies to build infrastructure. Under a BOT, the private sector finances, builds and operates a wholesale market facility or other infrastructure works according to performance standards set by government. The operations period is long enough to allow the private company to pay off the construction costs and realize a profit. At the end of the agreed period the public sector buys back or leases the completed facilities from the private investors. The government retains ownership of the facilities and becomes both the customer and the regulator of the service. BOTs, however, are less commonly found in developing countries, because of the lower potential of the private sector to mobilize capital.

Build-Operate-Own (BOO)

Under BOO, control and ownership of the project remains in private hands. The private sector entity finances, builds, owns and operates an infrastructure facility effectively in perpetuity. An

example comes from water treatment plants serving parts of South Australia. The facilities were financed, designed, built and operated by a private sector firm. Yet they process raw water, provided by the public sector, into filtered water, which is then returned to the public sector utility for delivery to consumers.

Leasing

Lease contracts cover design and building or operation but not financing. The condition of the lease may specify that certain services must continue to be provided. Part of the risk is transferred to the private sector. An advantage of leasing over sale is that this allows the lessee to finance only working capital requirements rather than having to find finance to purchase fixed assets. Several of the ex-French colonies in Africa have adopted the *affirmage* system, where the municipality has a water facility constructed and then contracts a private firm to operate and maintain it. In some countries, governments lease the development rights to public-owned land. In Sri Lanka, for example, local governments rent municipal markets to private merchants.

Concessions

Under a concession, the government awards the private contractor (concessionaire) full responsibility for the delivery of services in a specified area, including all management activities. The concessionaire is responsible for any capital investments required to build expand or extend the business. The public sector is responsible for establishing performance standards and ensuring that they are met. The public sector's role shifts from being the provider of the service to being the regulator of its price and service quality.

Joint ventures

These take place when the private and public sectors jointly finance, own and operate a facility. Joint projects have been designed as ventures between private sector businesses and, in some cases, development organizations. This is a model initiated widely by the Government of Germany. The German Technical Cooperation Agency (GTZ), together with DEG, offers private sector businesses and organizations the chance to join a PPP on projects in developing countries. Joint venture partnerships occur by linking the increased commitment of German businesses with the technical assistance of development organizations.

Operational/service management contracts

These contracts allow the private sector to provide infrastructure-related services or to manage the operations of an infrastructure facility for a specified period of time. In the agribusiness sector, management contracts are often used for running plantations and agroprocessing facilities for products such as tea, rubber and sugar. In some schemes, intricate incentives for profit sharing are included in the contract. Some international agribusiness companies provide packages of both managerial and technical assistance. In India and Chile, and many other Latin American countries, there are a number of schemes run by government where extension services are contracted out to the private sector.

Informal public-private cooperation

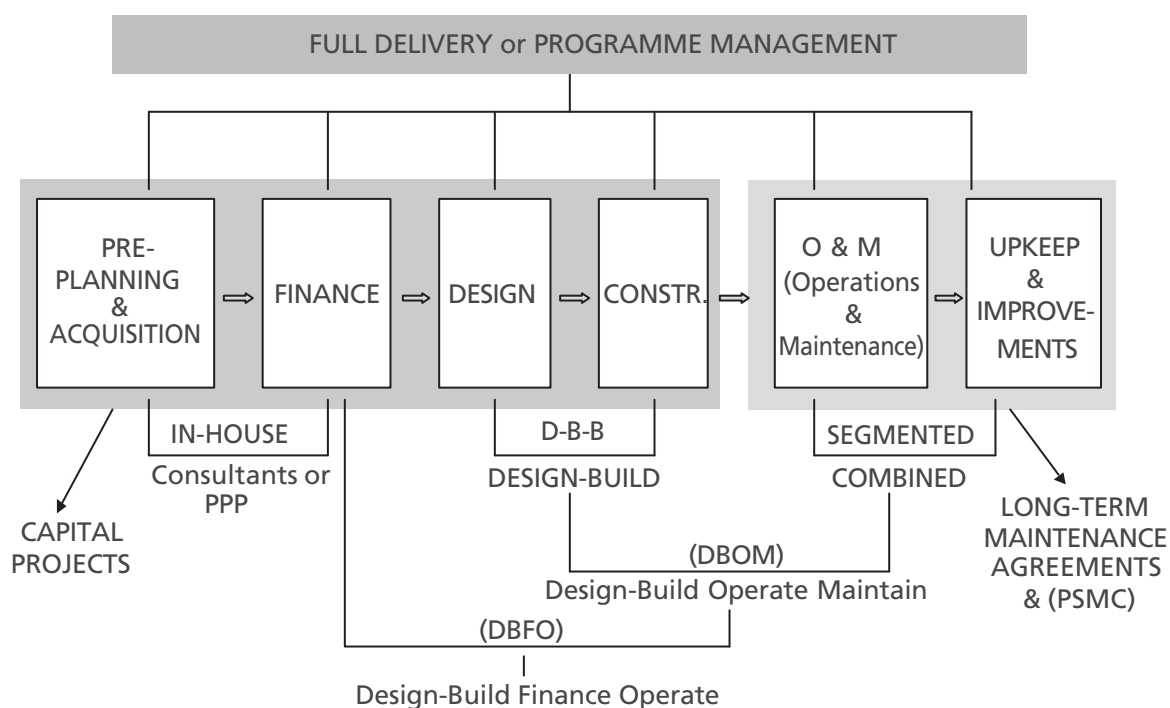
In developing countries, there is increasing voluntary cooperation among donors, international technical assistance agencies, national and local government, private companies (multinational or national), civil society and NGOs, in addressing social issues, providing infrastructure and providing public services.

In many countries, governments leave some services entirely to NGOs, or allow them to provide services of a higher quality or a more comprehensive coverage than those provided by the public sector. Coordination includes strategic alliances, which are agreements mutually entered into by any two or more bodies to serve a strategic objective.

Other types

- Build, lease, transfer
- Build, lease, transfer, maintain
- Build, transfer, operate
- Build, own, operate, remove
- Build, own, operate, transfer
- Lease, renovate, operate, transfer
- Design, build, finance, operate, manage (most common approach for PFIs – PFI)
- Design, construct, manage, finance

Figure 3.12 Linkage between contractual forms and main activities in infrastructure development⁹⁴



3.5 INSTITUTIONAL AND SUPPORT MECHANISMS

From a legal and institutional perspective, the development and operation of PPPs needs to be overseen by regulations and a governance structure that is at once defensive of the public interest, conducive to PSP, and responsive to changing circumstances. These issues are discussed below.

3.5.1 Legal framework for infrastructure Public-Private Partnerships (PPPs)

The institutional environment in which a PPP operates has financial, operational and social implications, affecting start-up, transaction and operating costs, as well as the transparency and accountability of investments to beneficiaries. The need for an incentivized and accountable regulatory environment, including effective legal frameworks, is widely viewed as key to the success of PPPs⁹⁵. Box 3.9 lists the principal elements of a legal framework for commissioning or negotiating infrastructure projects financed under PPP or similar schemes.

Box 3.9 Elements of a legal framework for infrastructure PPPs

- **foreign investment law** providing adequate protection for foreign direct investment;
- a **civil code** dealing inter alia with contracts, ownership, property rights, lease, secured transactions, guarantees, including performance bonds, and other types of security instruments securing the proper fulfilment of obligations under the various agreements pertaining to the PPP, etc., or at least separate laws covering these subjects;
- a **company law** that enables economic subjects to set up a separate legal entity with limited liability;
- a **bankruptcy law** that provides for a fair winding up of companies that have become insolvent; a creditor's rights should be protected in a balanced manner;
- a **concession law** that provides for a system under which the government may grant a concession to an investor to operate a specific project;
- a law dealing with **public procurement** in order to stimulate competitive bids and transparency in the procedure for awarding contracts for public sector works;
- a **court system that is independent**, impartial and well equipped to hear complex disputes between investors and state bodies, and for foreign companies recourse to some international arbitration service, such as the WB affiliated: ICSID;
- a legal system directed at prompt and adequate **enforcement of court decisions**;
- a **commercial arbitration law**: in view of the complexity of project finance deals, their requirement for confidentiality and a prompt resolution of disputes as, in many cases, commercial arbitration is preferable to proceedings in a state court of law;
- private international law or **conflict of laws** rules, according to which the applicable law is determined as well as the competent court, and the procedure for the recognition and enforcement of foreign court decisions and arbitration awards;
- some countries that have experience with infrastructure projects financed under BOT schemes have introduced a **BOT law**; such countries include the Philippines, Malaysia, Viet Nam, Turkey, and Egypt;
- **environmental** legislation, because most infrastructure projects have an impact on the environment;
- a law on **zoning** providing for a regulatory framework and for a standard procedure that should ensure an appropriate exploitation of land and other natural resources. Among the main purpose of such a law is to take into account and adequately to balance all interests involved in land development;
- a law on **construction**, providing for standards that constructors have to comply with;
- **intellectual property (IP)** laws protecting IP rights involved in a PPP, protecting patents, expertise, licenses, etc.

3.5.2 Regulatory framework

Agriculture-oriented infrastructure provided under a PPP arrangement is essentially a form of targeted public good, in that it is non-exclusionary. However, by focusing on one or more aspects of agricultural development, it is invariably targeted at a discrete sub-subsection of the population. Introducing private sector finance into this infrastructure provision may further restrict the range of the beneficiaries, with the service accessible only to a portion – possibly the more wealthy section – of the agricultural value chain. That is, those who can pay a user fee or tariff at a level sufficient to service the debt of the private party and its investors. To counter these exclusionary pressures, it is essential for PPPs to operate within a suitable regulatory framework, so that the wider public benefit is maximized, for example, performance-based contracts carrying a universal, or near universal, service obligation.

Important regulatory considerations for infrastructure PPPs relevant to agricultural growth include:

- whether there is need for an independent regulator, for example, if state-owned companies (such as in telecommunications) are effectively in competition with private operators, as is the case in parts of India;
- protecting customers against monopolistic abuse while ensuring the viability of investments and profits sufficient to support further network expansion, if this is policy;
- transparency and accountability in regulatory decisions, to ensure public support and independence from vested interests;
- open bidding and evaluation procedures for private service provision;
- incentives for the provider to become increasingly efficient over time;
- a capability to undertake comparisons of private sector performance data over time.

One controversial area of regulation is whether or not to regulate informal, small-scale infrastructure providers, such as providers of subsidized irrigation equipment, or “last-mile” mobile telecommunications providers. If such providers are not monopolistic, then it may be that they do not need regulation, although their role in serving the poor could still be stimulated under some sort of licensing arrangement. However, small-scale vendors, if enjoying monopolies, can lead to inefficient and high-priced patterns of service provision. Drawing on experience with small-scale vendors in the water and sanitation sector, “light” regulatory options for formalizing small-scale infrastructure providers include:

- voluntary frameworks and operating principles to improve quality, reliability and accountability that providers sign up to and use to aid their marketing;
- microfinance as an incentive for reaching quality and reliability standards;

- performance requirements within the concession agreements or purchase agreements of local government authorities that require the main infrastructure providers to allow access to smaller-scale providers at reasonable cost, and to provide help in improving the quality and reliability of their services;
- development of associations of small-scale providers to spread good practices and strengthen negotiation and lobbying capabilities with local government authorities, utilities and regulators;
- formal contractual agreements with small-scale providers to manage and operate mini-networks on conditions that both give formal recognition to informal vendors.

3.5.3 Public Private Partnership (PPP) project development

The transaction costs in developing the design of a PPP arrangement for infrastructure can be high. The longer the term of the arrangement, the higher the commercial risks, and the more likely it is that negotiations will be protracted owing to the need to, *inter alia*: (i) put together a consortium of lenders (to spread risks); (ii) arrange third-party risk guarantors (to take on long-term credit risk and manage political risk); and (iii) calculate the level of state and donor subsidy (to offset low rural user fees). Because of this complexity, private project sponsors frequently elect to undertake more detailed feasibility studies and wider-ranging risk analysis to inform their decision-making, thus adding to the transaction costs.

These development costs are multiplied in the case of competitive bidding. If significant concessions or subsidies are involved, there will be pressure to put the project out to tender, with the costs of the private party foregone unless they win the bid. The alternative, where the private sector approaches a government body and unilaterally attempts to negotiate a PPP deal, carries its own risks and costs, not least with respect to the competition principle that companies or consultants involved in early conceptual design should not take part in subsequent tenders.

The costs and risks of PPP project development are further elevated where the public entities lack the political autonomy or quality of advice to reach rapid decisions on the choice of private sector partner or joint venture. There remains a general lack of capacity within ministries, utilities and local authorities to assess different PPP scenarios, and to determine which are best suited to a given situation and how to structure the financing and procurement. This is particularly the case in countries with strong decentralization programmes, where provision of infrastructure services is being transferred from central to sub-national levels. Sub-national authorities (local governments, public utilities) frequently lack capacity to fulfil this new role, because of weak policy frameworks, inadequate institutional capacity, evolving regulatory environments, thin local capital markets and weak credit worthiness⁹⁶.

Private financiers and developers have pointed out that transaction advisors provided by donors to assist public parties do not have the requisite practical experience in the sector⁹⁷. Where development finance institutions and multilateral or bilateral donors are involved directly (either on the subsidy side or as a financiers), this again can lead to protracted project development. These institutions invariably have long and complicated financial planning and due diligence procedures.

In recognition of the wide range of challenges to project development in higher-risk PPP infrastructure projects, and the concern that this is discouraging the private sector from considering participation, governments and international donors offer various forms of project technical assistance to support these early stages, both for the private and public sector parties (Box 3.10).

Box 3.10 Forms of technical assistance for PPP project development⁹⁸

Enabling environment

- Designing regulatory approaches
- Project relevant institutional reform
- Capacity building to support projects
- Consensus building for projects and PSP

Project definition

- Prioritization with other projects
- Coordination and sequencing of infrastructure
- Identification of desired outcomes
- Identification of project champions
- Front-end project design, including performance standards

Feasibility studies

- Assessing different subsidy instruments
- Financial modelling
- Environmental, economic and social assessment
- Technical and engineering assessment

Project structuring and transaction support

- Assessing credit risk ratings
- Arranging third-party guarantors
- Structuring bankable projects, including optimum subsidy provision
- Designing and managing tendering procedures
- Negotiating contracts and payment mechanisms
- Ensuring compliance and regulatory requirements are met

A more recent donor innovation is the “project development company”, a private, donor supported entity that takes on the high upfront risks of developing up a PPP project and then makes its return by selling equity. One example is InfraCo, part of the PIDG family, discussed in further detail in Section 4.4. The advantage of such companies is that they fill the hole that private equity firms are unwilling to take on, essentially providing small amounts of high risk start-up funding.

3.5.4 Procurement processes

Designing an appropriate process for selecting private sector parties negotiating a PPP contract is important, and can make the difference between success and failure. The most common processes are as follows:

- **Negotiated agreement** – where the private sector makes a unilateral “approach” to the public sector with a proposal and thus avoids competitive bidding (such as the DrumNet ICT virtual outgrowers programme in Kenya, discussed in Section 8.1.1 or the KORD Fund in Uganda, Section 4.2.1);
- **Competitive bid** – a first-past-the-post competitive bidding or auction process, possibly with one or more “rounds”, but where the final proposal is accepted in competition against others, for example, the least-cost subsidy bidding process in India for PPPs in telecommunications (refer back to Section 3.2.2);
- **Competitive bid with preferred bidder status** – a competitive bidding process where, at some point (most commonly when there are only a very few bidders left in), a “single” bidder is provided a time-limited opportunity to develop up his or her bid, without further competition. The intention is that this will encourage the bidder to invest more resources into the design work, because s/he now has a far greater probability (but still not definite) chance of winning the bid;
- **Targeted procurement** – e.g. Black Economic Empowerment in South Africa – some form of “preferential” procurement process, either bidding or negotiated. Here, because of location, historic inequalities, etc. certain entities enjoy an advantage in the form of less stringent qualification criteria, support from a third party (e.g. donor) in preparing bids, etc. (covers both “positive discrimination“ and “positive action”).

3.5.5 Political will and public support

“Quite absurdly, political will is the biggest obstacle to successful PPPs: After all, PPPs only evolved because of government’s failure to deliver”... (Anon)

The importance of political will and public support for PSP in the provision of public services – water supply and sanitation schemes, basic education and healthcare – is well documented⁹⁹. In many countries, involvement of the private sector in the provision of rural infrastructure is a political contentious issue, especially if there is a perception that the infrastructure should be accessible for free, such as water supply and road transport. Moreover, the transfer of infrastructure service provision or network expansion involving the private sector, because of the way it internalizes risk and needs to generate a return on investment, can cause user fees to rapidly escalate. If the government has not prepared the user population for these rate increases, or has not factored in the capacity of households or other users to pay for the services, political consequences can result that harm both the investment and the potential users.

Private operators of public services frequently complain that governments show little commitment to meeting contractual obligations, viewing PPPs essentially as a mechanism to

secure “more for less”, i.e. leveraging private sector finance through concessions or subsidy to reduce the public investment budget. Political changeover poses a particular threat to the stability of long-term PPP arrangements, because newly elected governments, particularly if of a different political hue, may fail to respect commitments made by their predecessors. Accusations of corruption have also undermined the sanctity of many PPP contracts in these public services, and led to prolonged and aggressive contract renegotiations, or disputes that have ended in arbitration.

The lessons from PPPs for water, education and health infrastructure regard: (i) more transparent procurement and competitive bidding processes; (ii) mechanisms – such as multi-stakeholder fora – for infrastructure beneficiaries and the wider public to have an input into the policy, technology and PSP options; and (iii) the private parties or operators building strong relationships with current and potential customers who may then be a source of support disputes with political leaders.

Because infrastructure for agricultural development can be in part exclusionary (more so for irrigation, trading centres and agroprocessing facilities than roads or telecommunications), the politics of PSP can also be reversed. Instead of objecting to private companies benefiting from the financing of public services, the controversy is around whether the public sector should be subsidizing what are essentially private sector ventures, targeted at a minority of the public. The tests are threefold: Does the proposed infrastructure deliver on some broader public interest, such as improved production, diversity or employment generation? Would the infrastructure be constructed, or more efficiently operated, without participation of the private sector? And does involvement of the private sector bring better VFM compared with solely public sector provision?

Sections 4 to 8 Overview

The following Sections 4 to 8 present a suite of PPP models and variations for infrastructure to promote market-oriented agricultural development. These models are informed by examples drawn from the literature and case studies commissioned for this study. The main examples referenced are listed in the table below.

PPP EXAMPLES REFERENCED IN THE FOLLOWING SECTIONS

Section	Country	Title	Concept
Farm to market roads			
4.1	Tanzania	Morogoro Village Travel and Transportation Programme	Microroad infrastructure with users as PPP participants
4.2	Uganda	Kakira Outgrowers' Rural Development Fund	Outgrowers road financing and services management fund
4.3	India, Colombia	Integration of road infrastructure with extractive industry projects	Embedding public road infrastructure within private projects
4.4	Uganda	Kalangala Integrated Infrastructure Services Project	"Bundling" roads with other infrastructure into a bankable project
4.5	Non-specific	PFI	Road rehabilitation and maintenance under PFI
Water for irrigation			
5.1	Mauritania	Nakhlet Small-Scale Irrigation Scheme	Third-party irrigation management with limited commercial risks
5.2	Egypt	Nile West Delta Irrigation Project	Full cost recovery irrigation concession, with sovereign-mobilized capital
Wholesale markets and trading centres			
6.1	Ukraine, Poland	Kopani and Gdansk Wholesale Markets	BOO concession for a wholesale market
Agroprocessing facilities			
7.1	Kenya	Siongiroi Dairy Plant Limited	Agroprocessing plant- farmer-NGO joint venture with public subsidy
7.2	Fiji	Fruit Fly Treatment Facility	Debt-free agroprocessing PPP to meet market standards
7.3	Lebanon	Agricultural Center of the North	Not-for-profit DBOT (design-build-operate-transfer) agreement for multiprocessing and trading services
Information and communications technology			
8.1	Kenya	DrumNet Project	ICT infrastructure for a "virtual" outgrowers programme
8.2	South Africa, Bangladesh	Dikahotole Digital Village Grameen Village Pay Phones	Multistakeholder ICT PPPs for poverty reduction

4. Public-Private Partnerships and farm to market roads

The economic case for developing road infrastructure to link elements in the agricultural value chain – suppliers, farmers, extension services, collection points, wholesalers, agroprocessors, end user markets – is strong. This includes:

- increased access to the fields during the wet season, leading to better farm management;
- importance of farmers accessing rural wholesale markets, avoiding the loss of margins from dependency on local transportation agents;
- growing importance of urban retail markets, and the need for efficient and rapid transportation to distribute products, especially perishable produce;
- improved reliability of agricultural inputs, leading to higher yields and reduced post-harvest losses;
- diffusion of improved farming methods, including irrigation and other land management methods;
- increased flow of information between farmers, agricultural traders and extension service workers.

Five PPP models for agricultural-oriented road development are discussed below. The first is drawn from a project in Tanzania, and highlights how the users of village-level roads and tracks can be positioned as private sector participants in microroad rehabilitation and maintenance. The second, illustrated by a project in Uganda, provides road rehabilitation services where financial contributions derive from “captured” road users, in this case cane outgrowers and a commercial sugar mill. The third model combines (i) the “bundling” of road rehabilitation services with other more profitable ferry transportation, and water and power infrastructure services, and (ii) the strategic deployment of public capital and consumption subsidies to create a project attractive to private investors. A variant of the road subsidy component in this last model is also described, with reference to lessons from PFI in the United Kingdom. The section ends with a discussion of the constraints to the development of toll roads in promoting agricultural development.

4.1 MICRO-ROAD INFRASTRUCTURE WITH USERS AS PUBLIC-PRIVATE PARTNERSHIP PARTICIPANTS

Microprojects are a key component of regional road rehabilitation and maintenance programmes. Without rehabilitated rural feeder roads, tracks, wooden bridges and trails, the “first 10 mile” distribution of crops from the farm, and the “last 10 mile” transportation of agricultural supplies, can place strains on farm labour, especially for women who are responsible for much of the portage.

4.1.1 Morogoro Village Travel and Transportation Programme (VTTP)¹⁰⁰

The National Transport Policy of the Government of Tanzania recognizes that over 75 percent of the country's population lives in rural areas and is engaged in subsistence agriculture that will continue to be the backbone of the nation's development for the foreseeable future. Under its Integrated Roads Programme (part of the policy on transport sector restructuring), the Government proposes a series of coordinated infrastructure strategies, as follows:

- rehabilitation and improvement of priority trunk and rural roads essential for evacuation of agricultural products;
- strengthening the administration and management of trunk and regional roads;
- enhancement of road maintenance capacity in the country through promotion and use of local contractors;
- improvement in the availability of road maintenance equipment by encouraging the establishment of commercially operated plant hire pools;
- improvement in financial resource mobilization and allocation in order to provide for adequate maintenance of the trunk and regional road networks;
- reorientation of public expenditure (investment and recurrent spending) to increase the overall size of the road budget, and to allocate adequate funds for road maintenance and rehabilitation;
- implementation of a VTTP, in part to improve and attain efficiency in the performance of the agricultural sector by easing the transportation of inputs and products.

The last of these programme components – VTTP – is a response to the significant time and efforts devoted to transportation by rural populations in Tanzania, much of it in the form of intermediate means of transport (IMT) in close geographic proximity to rural communities and villages. In one rural market area, water and firewood collection and transportation of crops to grinding mills accounted for 47 percent of time spent on transport by households, and 93 percent of total transport effort in terms of tonnes per km¹⁰¹. These domestic trips are relatively short and frequent. Loads are small – between 20 and 30 kg – and mainly moved by head-loading women, who are the principal transporters, carrying 75 percent of the transport burden. Fifty percent of villages in the country are not accessible by two wheel drive (2WD) vehicles in the wet season because of a lack of culverts and timber bridges at stream crossings.

The VTTP is in its pilot phase, with six participating villages, and an anticipated total capital, maintenance and administrative cost of US\$4.4 million¹⁰². Local communities are organized into user committees to decide on the strategic design of microprojects to rehabilitate and develop road and track infrastructure in their immediate locality. Participating communities contribute labour, locally available raw materials and minor cash payments. The district councils contribute non-local raw materials and technical staff, such as district planners and district engineers. Central government provides grants to the district councils from the Local Government Road Fund (LGRF), or equivalent public expenditure budget, with the option for district councils to match LGRF funds in the future. Donors provide grants to fund technical assistance.

The actual rehabilitation and maintenance work is contracted by the district council to private contractors (for-profit or not-for-profit) on a “performance contract” basis. Procurement

of these services is on a negotiated basis. The small scale of the microproject is a disincentive to competitive bidding. Further, district councils lack experience in managing competitive tenders. At the time of writing, the programme was in the process of becoming internalized within the works department of the Morogoro and Mvomero district councils, under the support of the National Local Government Transportation Programme and supervised by the prime minister's office. With regard to enabling regulations, in Tanzania, the Road Act 2007 promotes involvement of the private sector in development, maintenance and management of roads. Local Government Act No. 7 1982 is supportive of PSP in transportation.

4.1.2 Micro-road infrastructure involving users and Public-Private Partnership (PPP) participants: model components

Drawing on the example above, the key elements of a PPP model involving beneficiaries is given in Table 4.1.

Table 4.1 Micro-infrastructure involving users as PPP participants

PPP component	Characteristics
Strategic purpose	Improve efficiency in the performance of the agricultural sector by reducing household "portage" costs, improving year-round access to markets and reducing post-harvest losses of perishable products. The focus of the model is on easing the transportation of inputs and products in close proximity to villages, through rehabilitation and maintenance of existing village-level feeder roads, bridges, footpaths and trails, i.e. micro-infrastructure projects.
Infrastructure coordination	Part of broader transportation policy to improve the priority trunk and rural roads essential for evacuation of agricultural products, and to strengthen capacity in public administration and private maintenance services.
Organization	Local communities organized into user committees to decide on strategic design in their immediate locality.
Resourcing	<ul style="list-style-type: none"> • Participating communities contribute labour, locally available raw materials and cash payments for rehabilitation and maintenance of road assets. • District authorities contribute non-local raw materials, and technical staff. • Central government provides grants to local authorities from central budgets. • Donors provide grants to fund technical assistance.
Cost recovery	No user fees.
Contractual arrangements	Rehabilitation and maintenance work contracted on negotiated basis by district authorities to NGOs and/or private sector contractors on a "performance contract" basis.
Main risks	<ul style="list-style-type: none"> • Community capacity to self-organize. • Reliable disbursement of grants.
Regulatory framework	Legal and regulatory framework conducive to involvement of communities and the private sector in development, maintenance and management of roads at the village level, e.g. a local government act or ordinance supportive of community involvement in transportation infrastructure.

4.1.3 Lessons

The importance of the legal underpinning of this model should not be underestimated, in particular its broad interpretation of the term "private" to include direct participation by community-based road users in the strategic design, resourcing and monitoring of those

aspects of transportation infrastructure that most affect their immediate livelihoods and well-being. Further, in Tanzania, the VTTP recognizes that “micro” transportation infrastructure is a critical component of wider integrated roads programmes, i.e. that the “first 10 mile” distribution of crops from the farmgate, and “last 10 mile” transportation of agricultural inputs, are key to growth in agricultural productivity in areas affected by seasonal rains and strong competing demands on female labour.

Clearly, the VTTP carries risks in relation to the capacity of village user committees to be able to articulate their strategic needs and monitor the performance of contractors. Ensuring representation by women on these committees, as the dominant users of the village-based road and track infrastructure, is essential. However, it seems likely that the district council will be the principal driver in implementing the rehabilitation and maintenance work. As such, it is not altogether clear how the VTTP is an improvement on conventional participatory planning in rural infrastructure development. If the participating communities were actually involved in asset ownership or signatories to concessions in some way, and/or received income from the district council or LGRF to support their direct involvement in asset maintenance, this might increase the incentives to sustain the infrastructure in the long term.

4.2 OUTGROWERS' ROAD FINANCING AND SERVICES MANAGEMENT FUND

Timely and reliable transportation of cash crops from smallholders and small commercial farmers to local agroprocessing facilities is a key constraint on agricultural growth. It may well be in the commercial interests of agroprocessing owners (public or private) to contribute to the development of this infrastructure, as well as in the interests of the producers themselves.

4.2.1 Kakira Outgrowers Rural Development Fund (KORD), Uganda

The relationship between the donor-supported KORD, sugar cane outgrowers and the Kakira Sugar Works (KSW) in Uganda is one example where interests have aligned to support an innovative PPP arrangement for rural road maintenance.

The KSW processes sugar cane grown locally and exports throughout East Africa. Two hundred thousand people live within 25 km of KSW, including a group of 3 600 outgrowers who supply sugar cane on a contract basis to the milling company¹⁰³. Main roads in the region are generally provided for and maintained by Government. The Government has allowed the KSW (presumably through a concession arrangement, although this is not verified) to construct 200 km of “murrum” feeder roads (non-tarmacked mud road) to enable the delivery of sugar cane from outgrowers to its mill. With the number of growers anticipated to rise to 6 000 in the next few years, there is a need both for capital investment in new feeder roads and funds to maintain the existing network, which KSW can no longer afford to maintain alone.

The KORD has been established as a not-for-profit infrastructure financing and maintenance services management company. Initial capital has been provided in the form of a grant from the KSW, and maintenance work is supported by contributions from outgrowers and the employee farmers of the KSW on a unit price of sugar cane sold or delivered to the processing mill. The KORD is not a conventional PPP, but acts as a manager of infrastructure

financing and maintenance services. It is also not an infrastructure development company, in that it has no capital of its own to invest and carries no equity.

The KORD undertakes two levels of road infrastructure maintenance: (i) full maintenance – upgrading of roads currently impassable by sugar cane truck; and (ii) partial maintenance – prolonging the life of the existing passable roads, e.g. through resurfacing of existing surface material and “spot” remediation. Total annual maintenance costs for the 200 km of existing road network in the 25 km zone are anticipated at US\$175 000. The KORD procures contractors to undertake the maintenance work on a competitive basis and leases heavy equipment. An anticipated US\$260 000 capital is needed to construct 100 km of new feeder road, which the KORD will need to raise as debt or grants.

The KORD also supports other strategic infrastructure and rural development needs. Priority infrastructure projects identified for funding in 2007 and 2008 included microfinance for outgrowers, upgrading of ten farm roads, seven classrooms and a vehicle fuel station.

4.2.2 Outgrowers Road Financing and Services Management Fund: model components

The KORD arrangement has been used below to develop a model of a road infrastructure financing and services management fund in the context of an agroprocessor’s outgrowers’ programme (Table 4.2).

Table 4.2 Outgrowers’ Road Financing and Services Management Fund: model components¹⁰⁴

PPP component	Characteristics
Strategic purpose	Overcome the infrastructure constraints for outgrowers to supply cash crops to a local processing facility in a timely manner with improved certainty of supply; and improve access for farmers direct to local market towns and various public services, e.g. education and healthcare.
Infrastructure coordination	In addition to road construction and maintenance, other infrastructure projects critical to improving the competitiveness of the value chain are facilitated by the Fund, e.g. health care, strategic location of a fuel station, classroom construction.
Organization	As part of improving the competitiveness of the value chain for the cash crops, an infrastructure financing and maintenance service fund is established, mandated to facilitate investment in new rural roads and to rehabilitate the existing network. <ul style="list-style-type: none"> • The Fund is incorporated as a not-for-profit company limited by guarantee. • The Fund has board members comprising farmer representatives and representatives from the processing facility. • The functions of the Fund are to (i) identify road maintenance and construction priorities; (ii) manage the financing thereof; (iii) provide project management of maintenance and construction activities, including procurement through competitive bidding. • The Fund is supported by the local growers’ association, which provides nominal financial contributions. • Prospect of local government using the Fund to channel public investment into new roads and contributing to maintenance.

PPP component	Characteristics
Resourcing	Initial financing of the Fund is from debt and grants raised from, inter alia: the processing facility (e.g. the KSW contributed a 25 percent grant), interest on microfinance or other indirect financing (e.g. the KORD anticipates 10 percent interest repayments from microfinance to outgrower farmers), commercial financial institutions or development finance institutions (as debt), donors or local government (e.g. KORD requires around 50 percent grant funding if it is to develop "new" road infrastructure).
Cost recovery	Debt service repayments, top-up capital for new road construction and purchase of equipment for leasing (i.e. beyond the above grants), and operating costs (administration and maintenance) – recovered by annual contributions from (i) outgrowers at a unit price per tonne sold to processing facility; and (ii) processing facility's employee farmers produce sold to processing facility at a unit price per tonne delivered to facility.
Contractual arrangements	Presumed concession arrangement between the government and the KSW to construct and maintain 200 km of road. Fund leases road maintenance vehicles (bulldozers, wheel loaders, motor graders, tipper lorries, compactors, water bouzers) to carry out road maintenance. Local building companies tender on a competitive basis.
Risks	<ul style="list-style-type: none"> • Payment risk – outgrowers fail to pay their ongoing contributions. • Administrative costs of Fund become prohibitive (trying to do too much). • Fund undermines statutory duties of local authorities.
Regulatory framework	Legal framework allowing not-for-profit private entity to maintain Government roads, and fulfil related statutory obligations. Not-for-profit status of Fund also means eligibility of certain tax breaks. Government continues to own all roads and carry ultimate responsibility for maintenance.

4.2.3 Lessons

One limitation of this model is that it relies on funding for road infrastructure from the relatively rare combination of (i) private agroprocessing businesses in the cash crop sectors (sugar, tea, coffee, etc.) willing to contribute both an initial grant to establish the Fund and make annual contributions; and (ii) outgrowers to the processing facility willing to contribute to the Fund on a unit price sold basis. The revenues raised in this way are sufficient to support the maintenance and rehabilitation of the feeder road network, but not to finance debt servicing to construct new roads. For this, dedicated donor grant funding or subsidies from local government would be needed.

The experience of the KORD to date suggests a number of success factors for such a fund:

- a strong commercial incentive for the agroprocessing business to provide upfront grant capital to establish the Fund;
- outgrowers willing to contribute to road infrastructure maintenance;
- a Fund that facilitates other strategic infrastructure considered a priority by the outgrowers (e.g. in the KORD case: fuel station and classrooms) thus providing additional incentive for outgrowers to contribute to the Fund on an ongoing basis;

- a means for the Fund to raise additional funds for recurrent expenditure through other services, such as microcredit.

On this latter point, it is notable that, because the KORD has no concession agreement with government, it is thus not able to commercially develop land adjacent to the rehabilitated roads and realize an additional return this way.

Looking to the future, the intention is that the Fund becomes a vehicle for channelling local government subsidies into infrastructure projects and managing not only public but also privately raised capital in order to develop new infrastructure projects of a more conventional PPP nature, e.g. under a BOT contract. It is not easy to comprehend how such a transformation would work in practice, because the former would presumably mimic an efficiently run local government public works department, and the latter run up against a lack of outgrower financial contributions sufficient to support the servicing of debt in a BOT project.

4.3 EMBEDDING PUBLIC ROAD INFRASTRUCTURE WITHIN PRIVATE PROJECTS

A variant on road infrastructure PPPs that explicitly links outgrowers to agroprocessing facilities involves PPP arrangements that extend infrastructure conventionally developed for private purposes such that it benefits the wider public and broader agricultural development. In rural areas, these cases are most common in the extractive industries and large-scale agricultural production sectors, i.e. where the private entity has the dual objective of building its “social license to operate” with local communities, as well as saving on capital and operational expenditure on infrastructure. The WB’s Business Partners for Development (2000–2003) initiative facilitated and studied a number of such PPPs:

- *West Bengal, India*¹⁰⁵ – upgrading of a 10.5 km rural link road between a mine site and railway siding. The road both enables transportation of coal for the firm, and aligns closely with the aims of the district authority’s transport plan to improve farm to market access and access to local health centres and schools. Through the PPP, capital cost savings of 25 percent were secured by the mining firm and 75 percent by the district authority. The regulatory permitting and approvals process for construction was “fast tracked” – 20 percent of the conventional time for such a project.
- *Casanare Department, Colombia*¹⁰⁶ – a 20 km joint public-private-community road project providing access to isolated, highland communities. The road enabled British Petroleum (BP) to explore for oil in Niscota region. Capital cost savings were borne by BP, with maintenance costs shared between a number of local and regional state authorities. The project resulted in an 80 percent decrease in journey times, more rapid access from farm to market and health and education services, as well as local employment opportunities arising from road construction and maintenance.

Drawing on the more detailed reports of these two cases from the research programme, the following PPP model can be deduced (Table 4.3).

Table 4.3 Embedding rural road infrastructure in private projects: model components

PPP component	Characteristics
Strategic purpose	Facilitate improved access by local communities to markets and public services, while concurrently providing essential infrastructure to a private party.
Infrastructure coordination	Integration of PPP with local government authority strategic transport policy and plan, thus leveraging public funds and aligning with the democratic planning process.
Organization	No single fixed organizational model – road assets could be owned by private or public sector.
Resourcing	<ul style="list-style-type: none"> • Unlikely to be free-standing, non-recourse, financing, because private sector costs wrapped up in larger project costs. • Sharing of capital costs between private and public entities. • Road maintenance costs most likely provided by the private entity in the first three to five years, then passed to public sector.
Cost recovery	Options include flat rate license payment for use of road paid by private entity to public entity, or standard user toll.
Contractual arrangement	<ul style="list-style-type: none"> • Local NGOs and local community representatives play an important facilitating and communication role. • Voluntary Memorandum of Understanding (MoU) to establish working relationships and common vision (includes community representative and NGO stakeholders). • Subsequent legally binding PPP concession contract between public and private parties to manage capital financing and service performance obligations.
Risks	Private party dominates road use to detriment of access for local communities.
Regulatory framework	<ul style="list-style-type: none"> • Legal framework allowing private company to finance, build or operate road assets. • Road ownership retained by government.

4.4 “BUNDLING” ROADS WITH OTHER INFRASTRUCTURE INTO A BANKABLE PROJECT

Section 2 highlighted the importance of focusing strategic planning to overcome infrastructure coordination failures, for example, sequencing the development of reliable and affordable electricity with investments in cold storage facilities, or rural roads rehabilitation works integrated with investments in new agroprocessing facilities. An example of such coordination is the KIIS Project.

4.4.1 Kalangala Integrated Infrastructure Services Project (KIIS), Uganda¹⁰⁷

The project has been developed by InfraCo (part of the PIDG family): a donor-funded project development company established to structure bankable private and PPP investment opportunities and offer them to the private sector prior to financial closure. InfraCo is managed by InfraCo Management Services Ltd, a private sector manager comprised of professional infrastructure developers and financiers.

The Kalangala project is an innovative attempt to finance the development and maintenance of an interdependent programme of infrastructure on Bugala Island in Lake

Victoria, Kalangala District, Uganda. In terms of general household consumption, the district, of which Bugala is the principal island, is ranked second only to Kampala, with two-thirds of the economically active population engaged in fisheries and agriculture, including 5 100 fishing crew members and fish landing sites, an important source of employment.

The project has been established to provide:

- affordable and reliable ferry transportation services (two 120 metric tonne roll-on roll-off passenger and vehicle ferries);
- a 600 kW solar photovoltaic electricity power generating facility, with 2 x 250 kW diesel generators to meet peak consumption periods and a 33 kw transmission line and low voltage distribution grid;
- a series of solar-powered pump-based water supply systems to replace gravity flow water supply that use spring water of decreasing environmental quality;
- upgrading of the island's main 66 km unpaved murrum road from a sometimes impassable dirt road to a Class B gravel road.

The demand forecasts for this infrastructure depend on continued growth of the island's population at 3.8 percent per annum, as well as immigration to the island and rising incomes because of the proposed infrastructure improvements. A proposed oil palm project on the island may also affect the user demand, and the infrastructure has been designed to accommodate this. In addition to providing direct benefits to the island population, contributions to agricultural development from the infrastructure will likely:

- spur additional investment, such as ice production and cold storage for the fishing industry and higher-end accommodation for the tourist industry;
- improve connectivity and accessibility between the mainland and the island, and between the towns and communities along the road;
- reduce transaction costs for local businesses (easier access to markets, reduced travel times, cutting out middlemen, etc.);
- allow traders to store perishable goods (refrigeration of fish is key for fishermen).

Commercial structure

The Kalangala Infrastructure Services is a SPV set up to own, finance, construct, operate and maintain the proposed infrastructure. The capital costs of the project are being financed on a project finance, limited-recourse, basis, comprising:

- private equity in local currency provided by regional institutional and strategic investors. In attracting this, the NPV IRR of the project was calculated at 18 percent, with break even at Year 5–6, and an assumed high debt to service ratio of around 50 percent;

- senior debt financing, provided under a 15-year local currency facility by local commercial banks;
- an ORET grant (a subsidy) from The Netherlands development finance institution FMO for approximately 50 percent of the capital cost of the Main Island Road, and a smaller percentage for the ferry landings.

Details are below, in Table 4.4.

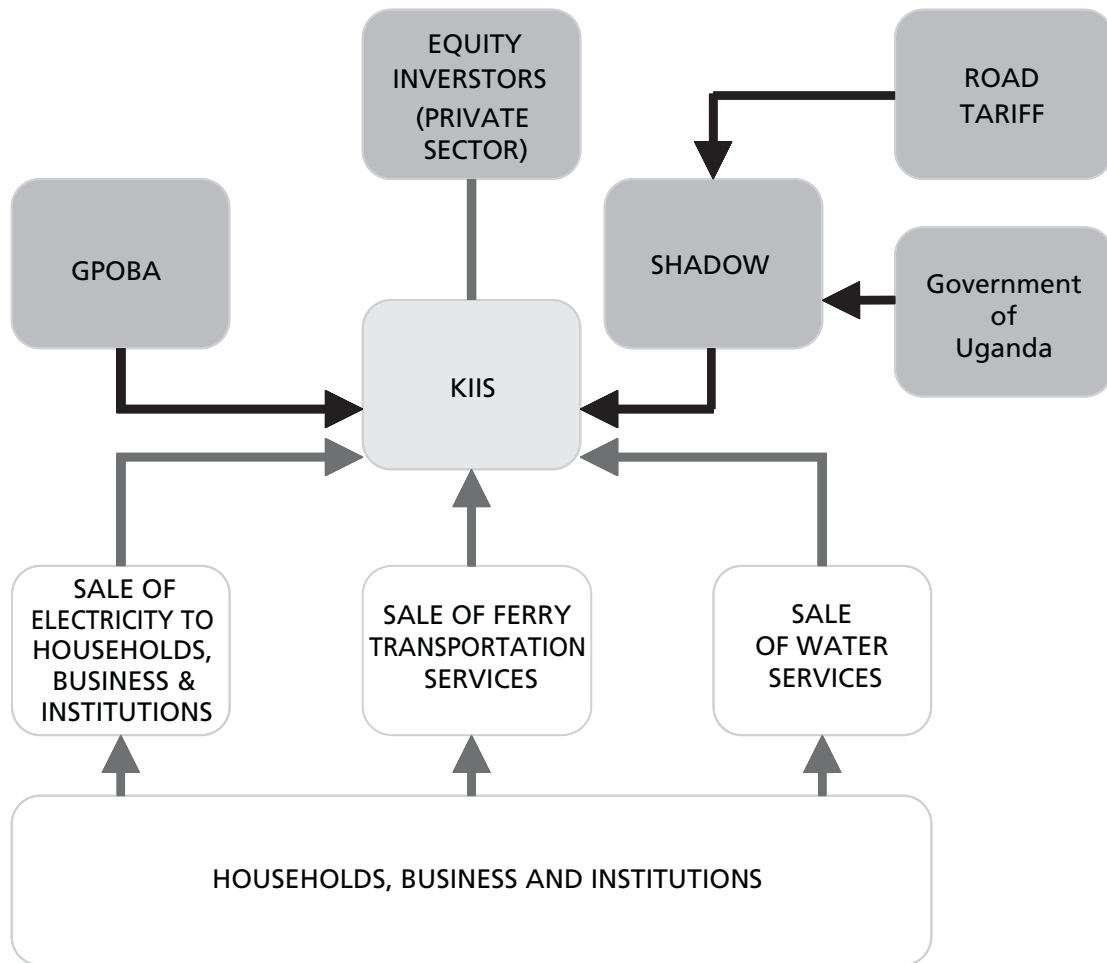
Table 4.4 Capital funding of the Kalangala Integrated Infrastructure Services Project (KIIS)

Sources	US\$ 000	UGX 000	Uses	US\$ 000	UGX 000
ORET Grant	4 394	7 689 977	Construction Costs	26 498	46 803 346
OBA Connection Subsidy	1 716	3 081 181	Development Expenses	6 064	10 618 437
Senior Debt 1	8 811	15 500 000	Reserves	199	363 706
Senior Debt 2	8 811	15 500 000	Financing Costs	2 412	4 332 020
Equity	12 415	22 065 798	Contingency	973	1 719 447
Total sources	36 147	63 836 956	Total uses	36 146	63 836 956

On-going operational costs, including infrastructure maintenance, are derived from a number of sources:

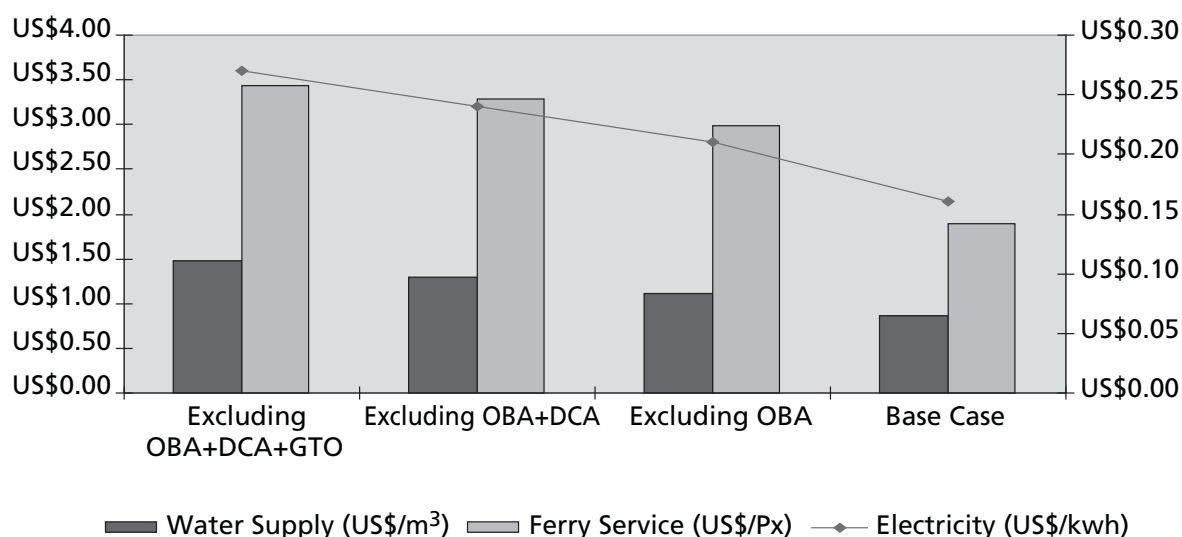
- sale of ferry transportation services on a vehicle usage basis;
- sale of electricity to households, business and institutions;
- sale of water services on a tariff basis;
- consumption-based subsidy from the GPOBA – see Section 3.2.3, Box 3.5. These subsidies are targeted at those who can least afford the infrastructure during the early period, when demand for (and therefore revenues from) the project has not yet been optimized. The subsidies are to be paid only during the first four years of operations. When the OBA subsidies expire, income levels on the island are assumed to have increased sufficiently to provide the revenues required for the project to meet its operating and debt service obligations and make a return for the investors. The OBA subsidy includes an implicit connection subsidy for water and electricity, although the majority of this is built into the capital costs of the project.
- shadow toll (subsidy) for road usage, independent of vehicle volumes, and that includes a portion for recovery of capital costs.

Figure 4.1 Commercial structure of the Kalangala Integrated Infrastructure Services Project¹⁰⁸



Two financial guarantees are also in place, as follows. Repayment of senior debt to local banks is third-party guaranteed through a PCG for 60 percent of the outstanding principal, with the aim of improving the lending terms and debt maturity. The PCG will be issued by USAID (under the DCA) and GuarantCo Ltd (another of the PIDG family). Further, the Government of Uganda is providing political risk protection (a sovereign guarantee) under an implementation agreement that requires the government to purchase the project (all components) for a termination amount sufficient to repay debt service and equity in the event of a political *force majeure* event. This termination agreement is not backed by WB through a partial risk or similar instrument.

The subsidy income – from the OBA and shadow toll Gate Toll Operator (GTO) – increases the reliability of revenues, allowing the project to increase the amount of debt financing it can raise. This in turn reduces the cost of capital and allows the project to reduce the level of tariff to end users. In addition, the use of credit enhancements (see DCA) in the figure below) compounds the benefit. The effect of these three financing instruments on the five-year average tariff is illustrated below.

Figure 4.2 Effect of revenue subsidies and guarantees on five-year average tariff

Operations and maintenance

To improve the financial sustainability of the project, each of the infrastructure components utilizes basic, proven and readily maintained technology, ensuring low maintenance costs. Further, technology is to be used that is of low variable cost, allowing KIIS to meet increases in demand and generate higher revenues with a lower proportional increase in operating costs.

Management of operations by KIIS by trained staff are separated from the maintenance of the various infrastructure components, which are to be outsourced to the equipment suppliers. This seeks to reduce overall operating expenses, and ensure control of quality, cost and reliability of service and maintenance delivery.

Regulation and contracts

The district government has authorized the development of the project under a private sector umbrella and through the issuance of necessary permits and operating licenses in accordance with the existing legal framework. Once the project is in commercial operation, the public sector, through the relevant regulatory agencies, will have oversight of the activities of the SPV, including the setting of tariffs to end users.

4.4.2 “Bundling” roads with other infrastructure into a bankable project: model components

Table 4.5 takes the elements of the Kalangala project and constructs a generalized PPP model for bundling rural infrastructure, including road rehabilitation, under a special purpose project company into a fully commercially viable and bankable project.

Table 4.5 Bundling roads with other infrastructure into a bankable project

PPP component	Characteristics
Strategic purpose	Improve the reliability and affordability of a range of agriculture-oriented and public service infrastructure, including rural roads.
Infrastructure coordination	An integrated infrastructure project where the choice of services is mutually supportive in growing demand.
Organization	<ul style="list-style-type: none"> • A project development company to identify, develop and commercially structure the project and offer it to private investors. • A project (implementing) company to finance, build, own and operate the project under a single SPV.
Resourcing	<ul style="list-style-type: none"> • Reliance on bankable market forecasting of demand to support debt and equity investment (instead of depending on long-term purchase agreement). • Local currency financing by commercial banks with partial credit risks guarantees to extend loan tenor and reduce cost of debt servicing. • Private equity in local currency (debt equity ratio of 50 percent+). • Capital subsidies from government and donors, especially for road rehabilitation component.
Technology	<ul style="list-style-type: none"> • Project utilizes basic, proven and readily maintained technology, with low variable costs, ensuring low maintenance costs and efficient response to increasing demand.
Cost recovery	<ul style="list-style-type: none"> • Sale of ferry transportation services on a vehicle usage basis. • Sale of electricity and water on a tariff basis to households, business and institutions (connection charges waived to encourage uptake). • Performance-based user subsidy for limited period (e.g. electricity and water), targeted at those on lowest income. • Shadow toll (subsidy) for road usage, independent of vehicle volumes, include portion for recovery of capital costs where not already covered by capital grant.
Contractual arrangements	Project company (SPV) operates infrastructure under a series of concessions and out-sources construction and maintenance on a competitive basis.
Risks	A sovereign termination agreement.
Regulatory framework	<ul style="list-style-type: none"> • Legal framework allowing private company to finance, build, operate and own public infrastructure. • Road ownership retained by government.

4.4.3 Lessons

There are at least four key factors in the potential success of this model: the role of the project development company; the effect of infrastructure “bundling” on the projects “bankability”; the strategic use of subsidies; and the management of demand risk.

Role of the project development company

The task of identifying and developing individual, non-recourse infrastructure projects in frontier areas is complicated, protracted and high risk. Attempting the same for an integrated infrastructure project is even more so. InfraCo was established especially to innovate in the use of a dedicated, and appropriately staffed, project development company. One of the key factors in its success is likely to be the level of access the company had to other donor infrastructure financing facilities (e.g. GPOBA), and thus its ability to structure a commercially viable project, with attractive equity investors. Achievement of a high debt to equity ratio of 50 percent is key. The extent to which this equity is to be sold on at market rates would indicate

the future replicability of the model. It is possible that InfraCo, as a donor-supported project development company, might be willing to accept a lower premium than a private sector project developer in order to secure the required development outcomes.

Effects of bundling on project bankability

A feature of the Kalangala project has been the effect that “bundling” interlocking productive infrastructure has had on its overall commercial attractiveness – its “bankability”. This type of design not only might allow projects to reach a size of interest to equity investors and commercial lenders but also realizes multiple sources of revenue that mitigate against volatility in demand risk and generate tax revenues that can be used to support commercially unattractive infrastructure – such as road construction and maintenance – through consumption subsidies. Moreover, by strategically selecting infrastructure that collectively enhances both agricultural (and, where relevant, fisheries) productivity and the timeliness and reliability of related agricultural inputs and produce distribution, there is potential for rural income levels to rise sufficiently, enabling consumption subsidies to be phased out over time.

For road infrastructure, such “bundling” is particularly attractive, not least because it carries an opportunity to raise capital to support road construction or rehabilitation in circumstances where no user toll is possible. In the above model, the recovery of capital costs is assured through a combination of public capital subsidy (the 50 percent from a Netherlands grant [ORET] in the case of the Kalangala project), and a shadow toll that includes both a component to support the servicing of debt on the outstanding capital costs (similar to the way PFI for road construction works in the United Kingdom), as well as a portion for operations and maintenance. However, a variant on this model would be to cross-subsidize the unrecoverable costs of road rehabilitation and maintenance against the returns on the other infrastructure in the bundle. It is understood that in the Kalangala project cross-subsidization is avoided, with each component designed to pay for itself¹⁰⁹.

The model has particular application to rural locations when two sets of criteria are met: (i) when improved coordination and sequencing of agriculture-oriented infrastructure (including roads) would generate a predictable increase in user demand over the long term; and (ii) when the types of infrastructure involved would generate user fees or shadow fees sufficient to raise debt on a limited or non-recourse basis.

Strategic subsidies

A second potential success factor is the strategic use of capital and consumption subsidies, along with third-party guarantees, to ensure that the project remains financially viable, both in supporting a loan repayment rate acceptable to commercial lenders (and providing assurance for long-term tenors), and generating an acceptable return for private equity investors. This is the essence of PPP financing for rural infrastructure where full cost recovery cannot be commanded, i.e. to use aid and government resources to position the project as “close to market” as possible so that it is financially attractive to investors.

The NPV IRR of the Kalangala project is anticipated at 18 percent, with break-even at Year 5–6. This is achieved mainly because of the 50 percent (capital) subsidy for road and ferry landing capital costs, and the OBA and toll road (consumption) subsidies. In general, without such subsidies, the period to break-even in this type of PPP model would be substantially

longer, reducing the attraction of the project to equity investors. Further, even with these subsidies, the model requires a high debt to equity ratio. Although this reduces the level of debt and helps the profitability of the project, it also reduces the overall ROE.

Demand risks management

Because all debt, equity and revenues are in local currency, there are no exchange rate risks. The key risk is probably underdemand for services. There is some protection against demand risk built into the commercial structure. First, shadow tolls for road usage are independent of vehicle volumes (i.e. not performance-related). Second, although tariffs for the ferry service are based on assumed passengers and vehicle traffic, if there are shortfalls in actual traffic levels, the project company (in accordance with the regulator) is allowed to adjust tariffs within a pre-agreed band, affording a cushion to lower-than-expected demand. Electricity and water revenues, however, are fully exposed to demand risk. Here, some cushioning is achieved by waiving connection fees for electricity. Using pre-payment technology for water, electricity and marine transportation services, adds to the prospects of demand forecasts being fulfilled (a technology many rural populations are already familiar with from their experience of prepaid cell phones).

Residual risks

The highest risks are possibly around the short-term phasing out of the OBA subsidies, i.e. after four years. Problems of financial sustainability for the project may arise if, after the four years, those whom the subsidy targeted continue to bring in incomes insufficient to afford the water and electricity tariffs. Such circumstances would not only affect the livelihoods of these households and cash flow for the company, but also carry local political risks for the project as a whole, and possibly related risks for the sustainability of operating licenses (although, to some extent, this is mitigated in extreme circumstances by the termination agreement).

Civil work

With respect to all civil construction work – road, water, power – a possible limiting factor for project sustainability is the lack of experience of local contractors in construction of project components (especially those with significant mechanical engineering content), along with shortfalls in the capacity of these companies to provide sufficient performance bonding to secure against non-delivery.

4.5 ROAD REHABILITATION AND MAINTENANCE UNDER PRIVATE FINANCE INITIATIVE

The reader is referenced to Section 3.2.3. and Box 3.7 in support of this section.

4.5.1 The relevance of PFI

Failed and dangerous roads are common features of many rural road networks in developing countries. The following Table 4.6 captures the elements of a PFI model in a developed country (the United Kingdom) designed to provide investment for road rehabilitation and maintenance. Through the course of the 25-year design-build-operate (DBO) contract, the private entity will take responsibility for specified capital works over the first five years and, beginning in parallel, responsibility for road management and maintenance services over the life of the contract. The contract is between Portsmouth Council and Ensign Highways Ltd,

the latter a SPV owned by Colas Ltd and its parent Colas South Africa (part of a major road construction and maintenance group, with operations in many developing countries)¹¹⁰.

The model is interesting from this study's perspective because it ensures that service payments for maintenance commence "in parallel" with the capital works, thus releasing a revenue stream early and providing the private entity with cash flow to service debt and pay overheads. This works best where only part of the road network requires rehabilitation or construction (or part is scheduled for rehabilitation later) and an existing portion requires only maintenance.

In translating the United Kingdom approach to a low-income developing country context, a major obstacle would be securing guarantees against default by subsovereign authorities on commitments to make periodic service charge payments to private entities (i.e. spreading capital and operational costs over time via regular, performance-based payments). The Public Finance Management (PFM) systems in many low-income countries are at their most inefficient in relation to subnational government transfers. Weak tax-raising bases of local authorities compound the problem. The risk of default on service charges may be lowered in cases where elevated levels of indirect local tax revenues accrue to local government from the increase in agricultural and other productive activity as a result of infrastructure improvements. However, this is by no means certain and is prone to a significant time lag. The raising of long-term local bonds and creation of municipal development funds to finance infrastructure are alternatives (Box 3.3).

4.5.2 Private Finance Initiative (PFI) road rehabilitation and maintenance – model components

The model operates in much the same way as the road component of the KIIS Project, where costs incurred by the project company – capital costs, asset maintenance costs and a portion of overheads – are covered in a series of performance-based periodic payments by the local authority. The components of the PFI model, adapted to low-income country circumstances are given below.

Table 4.6 PFI for road rehabilitation and maintenance: model components¹¹¹

PFI component	Characteristics
Strategic purpose	Investment to halt decline in quality of road networks, where many lengths are in a "failed" or "critical" state, and provide a "one stop shop" for all road rehabilitation and maintenance.
Organization	Owner-operator SPV subcontracts to road construction and maintenance firms. Municipal Authority and central Ministry of Transport share service charge costs.
Resourcing	<ul style="list-style-type: none"> • Senior debt and equity raised with commercial banks and private equity funds, enabling SPV to fund core (capital) investment. • SPV secures third-party risk guarantees.

PFI component	Characteristics
Cost recovery	<ul style="list-style-type: none"> • Service payments divided between municipal authority and central government. • Service payments cover capital, operational and maintenance costs, plus risks and profit. • Service payments made against performance standards, derived from output specifications, e.g. network availability, usage by targeted vehicles, e.g. heavy goods vehicle usage.
Contractual arrangement	<ul style="list-style-type: none"> • Initial few years sees core capital investment period for major road rehabilitation works. Following this, contractor maintains roads to end of contract term. • Maintenance services of less damaged roads and related assets begin in parallel with capital works, providing instant revenue stream from local authority. • Private sector responsibility for specified capital works and takes “full responsibility” for maintenance of following structures – road surface, bridges, pavements, lighting, street cleaning, related tree and grounds maintenance, retaining walls, subways, culverts.
Risk	<ul style="list-style-type: none"> • Complexity of project development raises transaction costs and negates effective competitive bidding. • Absence of upfront capital subsidies extends length of debt servicing tenor, which in turn raises a wide range of commercial and political risks.
Regulatory framework	<ul style="list-style-type: none"> • Regulations allow for indirect revenues to be derived from advertising and sponsorship relating to the assets. • Local authorities retain certain high risk functions, e.g. traffic control.

4.5.3 Lessons

A number of relevant lessons were learned from Portsmouth PFI case of relevance to this study¹¹²:

- Invest time in collating accurate information on the condition of the assets and infrastructure as part of the planning process.
- In order to facilitate bid evaluation and negotiation with bidders, detail quantification of all risks associated with the project as part of the outline business case.
- Incorporate technical, financial and legal advisors with experience of similar schemes as members of the core project team.
- Develop and share a clear understanding of the ultimate outcome, i.e. the transfer of responsibility for “full stewardship of the road network”.

4.6 LIMITATIONS TO TOLL ROADS FOR AGRICULTURAL DEVELOPMENT

Toll roads financed by the private sector under BOT or BOOT concessions are generally developed where there is a high level of anticipated growth in user demand, usually residential or industrial. Although rural road infrastructure can significantly boost agricultural activity, at present it seems there is little appetite by private investors for involvement in toll roads other than those located in key urban areas (e.g. “expressways” to circumvent traffic congestion) or intercity highways. An overview of toll roads in selected countries follows.

4.6.1 Tanzania

The Integrated Roads Programme of the Government of Tanzania (see Section 4.1) highlights the range of infrastructure and support mechanisms that need to be put in place to promote agricultural growth in rural economies. This includes not only the aforementioned “first 10 miles” of transportation assets, but also improvements in rural-to-urban trunk roads and rural feeder roads, and strengthening of administration and contractor services. In Tanzania, the private sector is being considered as participants in these activities under various forms of service and management contracts, but no toll roads are being proposed. This situation is characteristic of developing countries with dominant rural economies, i.e. where the low density of vehicle volumes and the mixed use of road transportation (as both a public service and for agricultural growth) mean that the prospects of road users paying a toll sufficient to attract private finance are severely limited.

The situation is complicated in that most rural road programmes are likely to involve the rehabilitation or upgrading of *existing* road corridors, with users reluctant to be charged for using the same stretch of road they previously used for free. Greenfield interurban highways, and short-distance “expressways” to beat urban traffic congestion present an altogether different market, rarely displacing people from using their traditional routes.

4.6.2 South Africa

There are three major BOT toll roads in South Africa (i.e. where the private sector provides the finance), all significant transport corridors with vehicle volumes in excess of 3 000 to 3 500 per day, and construction costs averaging US\$1 to US1.5 million per kilometer. This includes the cross-border road with Mozambique¹¹³.

4.6.3 Indonesia

In Indonesia, 60 percent of the existing toll road programme has been deemed inappropriate, with urgent needs for donor multilateral or bilateral support. Only one toll road has been attempted with foreign involvement (a 66 km section of the Jakarta Outer Ring Road developed by Kværner and financed by the Hong Kong and Shanghai Banking Corporation (HSBC). The deal took eight years to complete, and government had to agree to guarantee the financing and provide revenue assurances. In the late 1990s the economic crisis hit and made the project unviable¹¹⁴.

4.6.4 Malaysia

Malaysia has pursued a BOOT policy for toll road construction since 1983, in part to “open up land areas for development”¹¹⁵ (it is not clear whether this is agricultural land or land for residential or industrial development, most likely the latter). Again, these are essentially highways, with 13 corridors constructed, totalling 1 200 km. Under the Malaysia model, the sector owns the land and assets, and the state provides significant subsidies and inducements, including: soft loans, advances for land acquisition, traffic volume “tariff” guarantees (for the initial few contracts), cross-subsidization opportunities from commercial development on the land acquired and compensation for termination of contracts. Foreign equity participation

is allowed up to 25 percent, essentially to bring in expertise or increase capital availability. Although the Malaysian model offers innovation in toll roads, especially the cross-subsidization opportunities from commercial development, the focus on highways only indirectly benefits smallholder farmers, such as those producing for distant urban markets. The toll roads are more likely to benefit commercial farmers who produce commodities in bulk for export, or wish to export high value, perishable crops that need to be transported quickly. The same limited benefits for rural agriculture are faced by the toll road programme in the Philippines and Thailand.

4.6.5 People's Republic of China (PRC)

In the PRC, the planned investment in road infrastructure in the 10th Five-Year Plan will increase the overall network by 150 000 km¹¹⁶. Between 1998 and 2020, over US\$150 billion is needed to complete the National Trunk Highway System (NTHS) with 50 percent of this coming from user fees and other direct charges. Under the 10th Five-Year Plan, US\$20–25 billion in private investment will need to be raised.

Models for increasing PSP in toll roads in the PRC include the following.¹¹⁷

- *Leasing* – Leasing arrangements are becoming more popular, where the private investor has control of road asset for a specified period of time without financial public involvement. In the PRC, these arrangements remain negotiated agreements. There is presently no successful experience of the application of longer-term concession-based BOTs or derivatives to the toll road sector. This option, such as leasing, has significant potential, but in order to attract international investor interest needs to be open and transparent and strictly based on commercial criteria. Financing is reasonably available in the PRC and a number of operators are moving into this developing market.
- *Use of securitization* – Securitization of public companies is another means for provincial authorities in the PRC to raise funds for toll roads. The securities exchange provides sound requirements for listing but the steps to be followed to set up the basic corporate structure are time-consuming. Further, while provincial government-controlled companies can manipulate profit to meet these criteria, for private operators it is harder to achieve consistent profit. Increased traffic and increased toll revenues will eventually make this option more attractive to private operators.
- *Debt financing* – Interest rates for domestic loans remain low in the PRC, thus local currency debt financing of the road sector, particularly revenue-producing projects, may be viable. The same is true with respect to the use of bonds. Issuance of bonds is centrally controlled, with each province given an annual limit to use across all sectors. The roads sector has not taken advantage of this modality to the extent of other sectors, e.g. industrial and commercial sectors. This is partly explained in that, when original traffic estimates are not realized, the toll revenues shortfall can quickly impact bond repayment. The PRC is moving towards a more open corporate bond market, and this will soon provide for increased flexibility in long-term debt financing.

5. Public-Private Partnerships and water for irrigation

Five percent of arable land in sub-Saharan Africa is irrigated, compared with 38 percent in South and East Asia and 10 percent in Latin America¹¹⁸. The United Kingdom Commission on Africa report recommends irrigation coverage should be doubled by 2015, with an emphasis on small-scale and microirrigation, bringing an additional 5 to 7 million hectares of arable land under irrigation at a cost of US\$2 billion. In Tanzania, for example, this type of investment is estimated to raise yields by an average of 5 percent, crop prices by 7 percent and put up irrigated land rentals by 40 percent per year.¹¹⁹

Table 5.1 Irrigation in the world¹²⁰

World Region	Population million 1997 1	Population in agriculture % 1997 2	Arable & perm crop area million ha 1995 3	Irrigated area million ha 1996 4	Irrigated area to arable land % 1996 5=4/3	Irrigated area per farm hectare own estimate 6
Western Europe	363	5%	79	11	14%	1,1
North America	242	2%	233	22	9%	8,6
Australia	18	5%	48	2	5%	5,1
East.Eur. + C.Asia	329	15%	103	17	16%	1,4
sub-Sahr.Africa	415	57%	119	6	5%	0,2
South + East Asia	3 182	59%	392	150	38%	0,4
M.East + N.Africa	340	31%	90	24	27%	1,1
Latin America	422	20%	156	16	10%	0,8
86 countries	5 311	45%*	1 220	248	20%*	4,4*

C.Asia- Central Asia

East.Eur- Eastern Europe

M.East- Middle East

N.Africa- North Africa

sub-Sahr.Africa- sub-Saharan Africa

* Averages

Across the developing world, commercial and non-commercial farmers have been active in investing and managing on-farm water management through a combination of traditional small-scale irrigation systems (40 percent of Morocco's total irrigated area for example) and groundwater development (50 percent of India's irrigated area). Contrary to the water supply and sanitation sector, there has been little private participation in large-scale irrigation and drainage schemes¹²¹.

The key challenges to the irrigation sector are those common to many types of publicly managed rural infrastructure. As discussed in more detail in Section 2.2.2, the problems form a vicious circle of inadequate publicly run operations and maintenance, poor service delivery, low levels of cost recovery, degrading infrastructure, inefficient infrastructure use, and unsustainable or volatile public subsidies. Irrigation also suffers from growing environmental degradation, social conflicts, and a lack of integration of irrigation and drainage systems.

The Agriculture and Rural Development Unit of the WB recently undertook a study of 21 PPP projects in irrigation and drainage¹²². For developing countries, these fell into three categories, with geographic variation (Table 5.2)

Table 5.2 Categories of irrigation and drainage PPPs

Level of risk to private entity	Latin America	Africa	Eastern Europe	Central and East Asia
Irrigation management transfer – PPPs with no commercial risk – water services charged to local authorities		SAED, Senegal Alaotra, Madagascar Nakhlet, Mauritania		
PPPs with commercial risks limited to operations and maintenance – water service charged to users	Juazeiro, Brazil Sonora, Mexico	Toula, Niger Ormva Reform, Morocco	Pequin Kavaje, Albania	Tieshan, PRC
PPPs with commercial risk in capital investment – water service charged to users		CSS, Senegal Dina Farm, Egypt Toshka, Egypt Guerdanne, Morocco		Eastern Uttar Pradesh, India

The main findings of the WB study are as follows:

- Demand for PPP is mostly a government initiative motivated by the need to reduce recurrent public subsidies to irrigation and drainage system operations and maintenance.
- Almost all cases were for PSP in one or more of the operations, management and maintenance functions.
- Two-thirds of the cases were for PSP in one or more of the capital investment functions. These PPPs were more sensitive to demand risks, water supply/resource risks, and “rural condition” risks (e.g. access for those most in poverty).
- The vicious circle of inadequate operations and maintenance can be broken by using third parties between farmers and the public entity, with the aim of professionalizing the irrigation management functions, i.e. asset management, operations and maintenance. The third party could be a financially autonomous government agency, a professionalized WUA or a private company.
- A key recommendation of the study is to focus donor assistance on developing PPPs for the service functions only, not capital investment, because this is less costly and risky.

Two PPP models are described below, one for the involvement of third-party private parties in the operations and maintenance of small-scale irrigation works, and one looking at private sector financing and management of a large scale irrigation scheme.

5.1 THIRD-PARTY IRRIGATION MANAGEMENT WITH LIMITED COMMERCIAL RISKS¹²³

In this model the role of government in the operations and maintenance of irrigation works are transferred under a management agreement to a WUA, such as a farmers' cooperative. The driving forces for the public sector is essentially to reduce the local authority's recurrent expenditure on irrigation, improve water management and fee collection, reduce social conflicts, and enhance the productivity and returns on investments for farmers.

Irrigation systems in many developing countries were established with substantial financial contribution from governments and international donors. It was assumed that the government and/or water users would be able to incur the cost of operating and maintaining the systems, made possible by enhanced financial gains from improvements in productivity levels of irrigated agriculture. This assumption has often proven unfounded; public irrigation systems in the developing world have frequently failed to generate returns commensurate with expectations, both for farmers and the public agencies that manage them. Three sets of criticisms have arisen:

- that government entities or parastatals have failed to set irrigation charges that cover actual operational and maintenance costs or failed to collect them;
- that these public bodies have been managing their involvement in irrigation in an “estate mode”, organizing mechanized cultivation, irrigation management, planting and fertilizer inputs, and marketing the farmers' produce. These costs are deducted from the income received and the residual passed to the farmers. Farmers in these systems invested little of their own capital and took few entrepreneurial or management decisions;
- that the high fixed costs of irrigated production (essential fertilizers, mechanized cultivation, service charges for water usage) have increased the need for working capital, i.e. short-term credit. It has been noted that, in the African context, as a result, returns fall far faster than yields in a bad year, and average internal returns are 20–20 percent of borrowed capital, less than the interest charged by private money lenders for short-term credit¹²⁴.

The importance of these factors is that irrigation infrastructure alone is not going to be sufficient to transform productivity and incomes for smallholder farmers. Such infrastructure needs to go hand-in-hand with land tenure reform (to incentivize long-term investments and enable the land to be used for collateral), efficient and responsive management of infrastructure, adequate and accessible inputs and markets, and access to affordable credit. Positioning WUA as third-party organizations between farmers and the state owners of irrigation infrastructure offers one model for reducing fixed costs, improving credit terms, and enhancing the quality and responsiveness of irrigation operations and maintenance.

5.1.1 Nakhlet Small-Scale Irrigation Scheme, Mauritania

The Nakhlet IMT project is located on the northern bank of the Senegal River in Mauritania. The project has the following characteristics:

- 27.5 ha area with 119 fields cultivated by 29 farmers;
- technology based on pumping from a tributary of the Senegal River;
- main crop rice, grown in wet season and yielding 8–9 t/ha;
- farmers' cooperative (a WUA) given management control over the irrigation assets by the government agency (original capital assets constructed by government);
- WUA raises credit to lend on to farmers; and manages water pumping and irrigation, input supply (herbicides, fertilizers, fuel, etc.) and land preparation;
- gross farm gate price US\$880/ha/season (average yield 5.5 t/ha);
- principal costs to farmers: labour (family and hired in) US\$191/ha/season; agricultural inputs (seeds, fertilizers, hire of machines, etc.) US\$120/ha/season; irrigation charges (operations and maintenance) US\$67/ha/season; share of depreciation of pumping equipment US\$20/ha/season; servicing of credit US\$22/ha/season; WUA/cooperative charges (US\$1/ha/season);
- IRR to farmers per season 103 percent; break-even yield 2.7 t/ha.

The organizational structure and level of commercial risk assumed by WUA in the Nakhlet irrigation project is summarized in Figure 5.1.

5.1.2 Third-party irrigation management with limited commercial risk: model components

The model is derived from the Nakhlet IMT project. (see Table 5.3)

5.1.3 Lessons

The high IRR of the Nakhlet project (103 percent) suggests that introducing a third party to help reduce the fixed costs to farmers, improve credit terms, and enhance the quality and responsiveness of irrigation operations and maintenance can be successful. What is less certain is how physical “shocks”, such as one year's poor harvest, would effect the viability of the model. In a bad year, whereas in the past the risks of servicing of credit would entirely fall in the individual farmer, to some extent the WUA now cushions this commercial risk. Further, because short-term credit and inputs should be more favourable as a result of the collective strength of the WUA, the rate of fall should be less. Further research is needed before firm conclusions can be reached on this. One area for further consideration could be for the WUA to provide some type of insurance scheme to individual farmers. Alas, the collective strength of

Figure 5.1 Organizational structure and level of commercial risk in the Nakhlet IMT Project

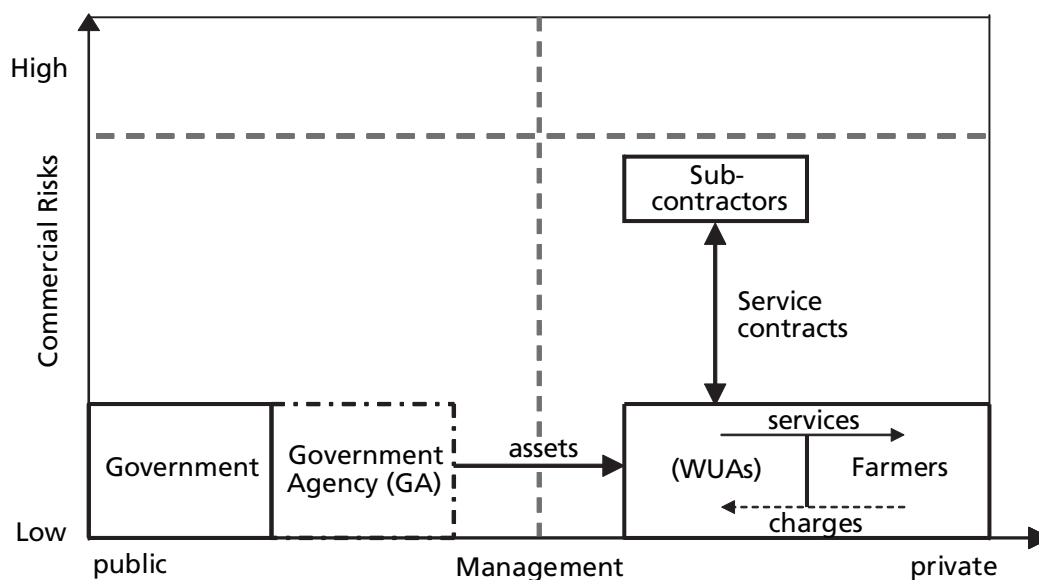


Table 5.3 Third-party irrigation management with limited commercial risk¹²⁵

PFI component	Characteristics
Strategic purpose	Reduce the local authority's recurrent expenditure on irrigation, and improve water management and fee collection, reduce social conflicts, and enhance the productivity and returns on private investments for farmers.
Organization	Water users' (farmers) association manages water pumping and irrigation, input supply (herbicides, fertilizers, fuel, etc.) and land preparation.
Resourcing	WUA uses collective strength to raise credit to lend on to individual farmers, to purchase inputs in bulk, undertake land preparation.
Cost recovery	Variable user fee payments by farmers to WUA for agricultural inputs, irrigation charges to support operations and equipment maintenance, and share of depreciation of irrigation equipment. Fixed charges to users to enable servicing of WUA credit as subscription charge.
Contractual arrangement	Management agreement with government authorities if taking over state assets. Service contract agreements between individual farmers and cooperative/WUA.
Risk	<ul style="list-style-type: none"> • Small scale of schemes. • High levels of fixed costs. • Lack of commercial experience of WUA. • Commonality of physical risks (weather, delays to inputs, etc.) across all farmers – elevating default risk and reducing capability of WUA to make debt service repayments.
Regulatory framework	<ul style="list-style-type: none"> • Recognize the existence and rights of farmers' cooperatives. • Recognize "IMT without abandonment", i.e. state retain ownership and ultimate liabilities. • Dispute resolution mechanisms, between farmers and the cooperative/WUA. • Initial technical assistance needed to establish cooperative, train members and negotiate management contract with state.

the WUA association would have little effect on the level of premium, because the probability of a claim is likely to be the same for all members.

Growth predictions in the use of provided infrastructure are a central part of the capital financing of infrastructure on a non-recourse or limited basis. For irrigation projects, these predictions are highly risky. One advantage of the Nakhlet model is that financing is primarily on a seasonal basis, and limited to supporting only operations and maintenance. This construct removes one of the key risks in non-recourse PPPs, i.e. that predictions of growth in use are not realized.

The above model is about farmer involvement in public service delegation, and suffers from the usual criticism of cooperative ventures: inexperience, member disputes, high administrative costs and inefficiency. The Nakhlet project aside, it is argued that these attempts in general are too small scale and “*proving insufficient*”¹²⁶, but that the need for a third party between farmers and the government remains. In response, it is suggested that the focus should be on improving the professionalism of the third party, be that a for-profit or not-for-profit entity.

5.2 FULL COST RECOVERY IRRIGATION CONCESSION, WITH SOVEREIGN-MOBILIZED CAPITAL

In most economically developing areas, the elevated risks and fixed agricultural costs described in the previous model means that fully non-recourse, zero-subsidy financing of irrigation projects based on user fee income is not commercially viable. The recent lack of interest by private parties in the Guerdane Concession in Morocco is a case in point¹²⁷. However, a more limited-recourse financing model, with the public sector assuming the main capital requirements of the project through debt, and providing financial support to a private operator when cash flow is challenged by changes in project circumstances outside its control, may be possible in certain conditions. These include areas where there is a coincidence of sufficient scope for productivity improvements, opportunities sufficiently large scale to attract concessional DFI interest, and a conducive regulatory environment capable of affording a private operator sufficient concessional flexibility. One such infrastructure project is the Nile West Delta Irrigation PPP project, supported by a concessional loan from the WB. This project reached financial closure in mid-2007.

5.2.1 Nile West Delta Irrigation Project¹²⁸

The Government of Egypt has supported commercial farmers in reclaiming desert lands since the late 1960s. The success of this policy has led to rapid agricultural development of a 100 000 ha area of reclaimed desert 60 km north of Cairo. However, it has also resulted in the gradual depletion of groundwater sources used for irrigation. To solve this problem, the government is proposing to replace groundwater with a surface water conveyance system, based on full cost recovery tariffs and volumetric pricing. Moving to such a system would allow the aquifers to recharge and to benefit farmers in adjacent areas.

The project aims to generate higher and sustained economic growth of export-oriented crops in the West Delta, as well as economic spillover effects in the service (packing, market

information, technical advice, logistics) industry and input industries (locally produced fertilizers).

The principal PPP component is the design, construction, and operation of a 25 200 ha–37 000 ha surface water system and connection programme, with a US\$205 million projected financing cost¹²⁹. Technical preparation studies for this component were based on a “demand-driven approach to planning”, where the growers’ willingness to pay for connection guided the technical design options with commensurate tariffs.

A piped system was chosen as the preferred option, given its advantages over open channel systems, particularly with regard to efficient water resource use and lower environmental and social safeguards risks. The final design will be completed by the private operator contracted to construct and operate the system on a long-term (20-year) basis. A fixed allocation of water resource will be made available by the Government to the project area, based on the estimated average annual water requirement per year per hectare.

Two other components of the project (not directly part of the principal PPP) include:

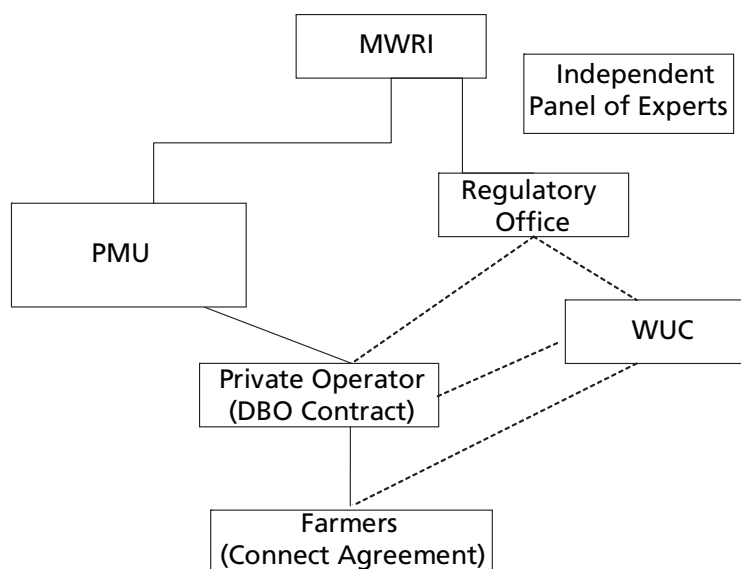
- *Market-driven technical assistance to small- and medium-size growers, traders, exporters and food processors* (US\$2 million) to increase market share of West Delta fresh and processed products’ on national and international markets. Component involves: production, post-harvest technology and farm management; market intelligence and logistics; food processing, packing and marketing to food processors to improve competitiveness and/or create new food products; and organizational arrangements for growers, traders and/or food processors to work in a coordinated manner within formal or informal organizations to achieve economies of scale and improve supply chain competitiveness.
- *Support for institutional development and capacity building of the project* (US\$6 million), including: (i) strengthening the Project Management Unit (PMU) and the contract management activities that would oversee contractual matters between the Ministry of Water Resources and Irrigation (MWRI) and the private operator; (ii) capacity building of the economic regulatory office to ensure effective regulatory oversight and equitable treatment of interests between the farmers and the private operator; and (iii) capacity building of the water user council (WUC) formed to oversee the relationship between farmers *vis-à-vis* entitlements and usage of surface and groundwater resources. Assistance is also being given for oversight supervisory engineers and technical audits of technical milestones.

Figure 5.2 shows the principal organizational structure of the PPP component. A DBO concession contract lies at the core. Financial disbursement from the government is to be managed by a dedicated PMU, which will also supervise the contractual arrangements. Handling of disputes and conflict resolution is to be supported by an independent panel via the Regulatory Office.

A single WUC is to be established to take an active part in project preparation and ultimately to govern a number of WUAs that will form once the beneficiaries of the project are subscribed. The WUC will manage potential conflicts between farmers on such matters as water entitlements, usage, hours of irrigation, etc. and will liaise with the private operator

and regulatory office to express farmers' collective interest on operational matters. To avoid potential marginalization of poorer stakeholders, an NGO – the Egyptian Water Partnership – undertook an information campaign and survey to identify farmers' needs; this should be reflected in the design. A Private Growers Advisory Council was also formed. There is at present no formal role for NGOs in the operation of the project.

Figure 5.2 Organizational structure of the Nile West Delta Irrigation Project



Regarding financing for the surface conveyance systems, the key components are as follows:

- *Debt* – 85 percent of project costs in the form of a loan to the Government from the WB (US\$145 million) with long maturity (20 years) and a four-year grace period on principal payments. The repayment is at a fixed rate, but it is not known if the rate is concessional against the market norms. MWRI makes this loan available to the project operator. This arrangement avoids foreign exchange risk for the project operator, with this risk, and the main credit risk relating to user demand, remains with the sovereign state. The arrangement also negates the need for third-party commercial (or DFI) credit risk guarantees, which would have prohibitively increased tariffs.
- *Grants* – no grant subsidies for the water conveyancing component. US\$8 million in grants from bilateral donors (Agence Française de Développement – AFD – and the government of the Netherlands for Components 2 and 3 of the project).
- *Equity* – approximately 8 percent of total project costs in private equity from project operator and investors, structured as a SPV.
- *Farmers capital contributions* – 3–4 percent of total capital derived as security deposits from farmers, retained by project operator as a liability on account (i.e. to protect against default on user service charge payments) and repaid to farmers if they withdraw from the scheme.

- *Early cash flow* – initial years of farmers “irrigation service fee” (during loan grace period) used to offset some of the total capital investment requirements (approximately 5 percent of total capital costs).
- *Debt repayment* – government pays interest and principal on loan from “concession fee” paid by the project operator to MWRI. This sum is equal to, or in excess of, the Government debt service commitment.
- *Performance incentives* – project operator is incentivized in two ways. The DBO contract allows the operator to (i) earn a profit on the construction portion of the contract, which can be utilized to meet its own counterpart financing requirements, thus lowering the initial cash outlay; and (ii) expand coverage, as in a conventional concession, to increase revenue, up to the limit of water allocation (e.g. if subscription is lower than anticipated).
- *Farmers pay a two part tariff* – (i) fixed charges to pay for the public surface water irrigation infrastructure and debt servicing based on farm area; and (ii) a volumetric charge to recover operations and maintenance expenses related to actual usage of water for irrigation.

The choice of a DBO/concession contract model, rather than conventional BOT/concession, is intended to meet the objective of a financially self-sustaining project with no capital or operation subsidies. To this end, unlike a conventional BOT concession, the main credit risks are not transferred to private investors. In the West Delta project, finance is to be raised by the Government, using its favourable cost of borrowing capacity with the WB, mobilizing long-term, concessional debt. As well as assuming these commercial risks, the DBO contract means that the project operator can solicit funding support from the Government, where cash flow positions fail to meet ongoing operational and maintenance expenses.

5.2.2 Full cost recovery irrigation concession, with sovereign-mobilized capital: model components

Drawing on the West Delta case, the following model of a concession-based irrigation project can be derived.

5.2.3 Lessons

Financial modelling

The West Delta case and the derived model seek to achieve two key financial sustainability objectives: zero subsidies (capital and operational) and affordable tariffs. This shows the importance of using financial modelling, where the main variables – equity, debt, debt financing terms, tariff (fixed and variable), demand, credit risk guarantees, other quantified risks and their mitigation – can be shifted around, and tested with prospective private investors and the government, until the two objectives are met. Financial modelling informs infrastructure planners whether it is the private party or the state that will need to bear the majority of the capital costs, as well as whether capital or consumption-based subsidies are inevitable.

Table 5.4 Full cost recovery irrigation concession, with sovereign-mobilized capital

PFI Component	Characteristics
Strategic purpose	<ul style="list-style-type: none"> • Higher and sustained economic growth of market-oriented crops. • Reduce environmental pressure on groundwater aquifers. • Concurrently achieve (i) full capital and operational cost recovery, and (ii) acceptable tariffs to farmers.
Infrastructure coordination	<ul style="list-style-type: none"> • Intended economic “spillover” benefits for agricultural services (locally produced fertilizers, packing, market information, technical advice, logistics). • Support to small- and medium-size growers, traders, exporters and food processors across value chain.
Organization	<ul style="list-style-type: none"> • SPV (private operator) established with private equity (highly leveraged 1:10 debt equity ratio). • Debt-mobilization for capital costs taken by sovereign party. • Relevant ministry establishes a dedicated project management to supervise compliance to technical standards and authorize disbursement of funds from relevant ministry. • Dedicated regulator.
Resourcing	<ul style="list-style-type: none"> • Equity from private operator combined with farmers security deposits. • Credit risk retained by state, enabling (i) concessional donor finance, (ii) avoidance of costly third-party credit guarantees, and (iii) zero capital or tariff subsidy. • Initial years of farmers’ service fee (during loan grace period) used to offset operator’s start-up costs.
Cost recovery	<ul style="list-style-type: none"> • Fixed user service charge to pay for (i) the public surface water irrigation infrastructure and debt servicing, based on farm area; and (ii) a variable volumetric charge to recover operations and maintenance expenses related to actual usage of water for irrigation. • Project operator pays ministry “concession fee” derived from “irrigation service charge”, which then pays interest and principal on loan.
Contractual arrangement	<ul style="list-style-type: none"> • Competitive bidding among prospective operators, including bid on required tariff rates. • DBO “contract” concession with state. • Project operator completes final design based on subscription of farmers. • Disbursement of funds by state based on outputs/milestones. • DBO contract offers two types of incentives: (i) profit on construction portion of the contract (enabling lowering of initial cash outlay; and (ii) expanded coverage up to the limit of water allocation (similar to normal concession).
Risk	<ul style="list-style-type: none"> • Number of prospective bidders may be too few (mitigated through expansion flexibility). • Demand risk – farmers fail to purchase contracted amounts, reducing the commercial viability of the project (mitigated by adopting a demand-driven design). • Regulator at MWRI subject to coercion. • Foreign exchange rate risk mitigated by sovereign party assuming debt.
Regulatory framework	<ul style="list-style-type: none"> • Regulatory framework that allows operator to: (i) require security deposits from farmers, (ii) disconnect in event of non-payment; and (iii) expand service if demand not fulfilled. • Splitting key functions, with regulation, monitoring and conflict resolution between farmers and operator assigned to a dedicated regulator; and contract management, approval of funding disbursements and technical oversight assigned to a PMU. • Single WUA manages potential conflicts between competing farmers, and provides a voice for WUAs.

Subsidy vs credit retention

Above all, this model highlights the stark choice of public sector concession planners between subsidies and credit risk retention. A conventional BOT concession transfers the liabilities for credit risk to private investors. This increases the cost of borrowing in many respects (repayment rate, grace period, tenor, cost of credit risk guarantees), pushes up the required ratio of equity to debt and depresses the overall attraction of the project to investors. For example, the West Delta project secured a 20-year maturity, with a four-year grace period, and quite likely a below market rate of interest, financing terms unavailable on the commercial markets for such a high-risk project.

The obvious solution when transferring credit risk to private investors is for the state to provide capital or consumption-based subsidies, either negotiated or administered as a competitive auction. The alternative is for the state to raise the loan capital itself at rates preferential to the commercial market or to DFIs, and retain the repayment risk. This the state can do either by securing concessional loans from donors, such as the WB or specialist loan facilities, including the less developed countries Infrastructure Fund of the Dutch Government, or by using its sovereign status investment rating on the capital markets, or both. With the state retaining the risk of default on debt servicing, debt equity ratios can be highly leveraged and the cost burden of securing repayments through third parties reduced, making the project more attractive to the private sector.

Further analytical research is needed to determine the comparative VFM of the two approaches to the public sector (subsidies vs credit risk retention), and their comparative attractiveness to private investors and prospective operators.

In the West Delta project, it was noted that the BOT/concession option would not have worked. Such models have “fallen out of favour among private sponsors and financiers largely because of the significant losses experienced in the past”¹³⁰. The DBO model works because it retains credit risks associated with a lack of user demand with the state. It also avoids transferring exchange rate risk to the private sector. In the West Delta project, government financial support can also be solicited in operational occurrences where cash flow positions fail to meet ongoing expenses.

Preparatory work

A number of technical studies were undertaken to develop the West Delta project, demonstrating the importance of using donor funds to support this. In addition, the two secondary components of the project show the value of thinking beyond the irrigation infrastructure itself, and looking at the wider value chain and institutional framework.

Technical assistance

Providing technical assistance to small- and medium-size growers, traders, exporters and food processors that is market-oriented increases the economic value contributed to the national economy. Further research would be needed on the expected returns of this assistance, but at around 1 percent of total project costs it has the prospects of being significant.

Fiduciary risk

Feasibility studies for the West Delta project identified fiduciary risks in public procurement of irrigation construction and maintenance service. The tendering of a single large DBO contract to implement all activities (procurement of subcontractors, engineering services, construction works, operations and maintenance), as well as an experienced team of engineers and transaction advisors on hand up to financial closure, mitigated these risks. The latter included technical assistance from the WB PPIAF.

NGO participation

In the West Delta case, to avoid potential marginalization of poorer stakeholders, an NGO – the Egyptian Water Partnership – undertook an information campaign and survey to identify farmers' needs, to be reflected in the design. A Private Growers Advisory Council was also formed, and the project itself is to establish a WUC to provide a voice for users. There is, however, no formal role at present for NGOs in the operation of the project. Given the risk of conflict inherent in irrigation schemes (and in the case of the West Delta project the shift from groundwater to surface conveyanced water), a variant of the model would be to include a representative NGO and the WUC and WUAs more formally, for example, affording them a right to consultation on the operator's final design and permanent representation in the regulatory authority.

6. Public-Private Partnerships in wholesale markets and trading centres

In this report, we take wholesale markets and trading centres to include all physical structures and related facilities for the primary and secondary storage, assembly, trading and pre-distribution of agricultural inputs, produce and livestock. This includes wholesale markets, market yards, crop and livestock auction points, crop collection points, producer assembly and packaging facilities, shared pre-and post-harvest storage and warehousing, as well as the various ancillary components of such facilities. These would include: weighbridge, cold storage, washing and packaging services, vehicle and machinery servicing, livestock sheds, veterinary services, telecommunication and logistics management services, and laboratories for quality testing.

FAO has provided assistance to many countries on issues relating to wholesale market development and improvement, and has identified poor development of this type of infrastructure as a key constraint to agricultural market development in a number of countries, including Uganda, Tanzania, Kenya, Swaziland, India, Indonesia, Egypt, Nepal and Thailand¹³¹.

For primary trading centres aimed at smallholder farmers and cooperatives, this type of infrastructure brings proper weighing, cleaning and grading to the process of commodities trading. More critically, perhaps, the same centres simulate the transfer of price information, providing farmers with confidence that they are buying inputs at market rate and securing returns commensurate with the true quantity and quality of their produce. In remote rural markets, where farmgate prices can be distorted by single village traders, the effect on both household income and productivity can be significant.

Larger, secondary wholesale markets in semi-urban and urban areas bring together traders from beyond the immediate command area. Here, the main benefits are full price transmission: the complete, or near complete, pass-through of price changes from end-user export and urban markets to wholesale markets (less transfer costs).

Overall, regulated wholesale markets and other types of trading centres form an essential part of the agriculture value chain, improving the competitiveness of farmers and supply chains for local, urban and export markets.

In India, where there are 7 161 regulated markets (March 2001), development has been “lopsided”, with a few states, including Rajasthan, Gujarat, Maharashtra, Karnataka and Punjab, investing in these facilities. In others, development is “quite inadequate”¹³². The more progressive Indian states have amended the regulatory framework – the Agricultural

Produce Marketing Committee (APMC) Act – to enable participation of the private sector and cooperatives in wholesale markets and trading centres. The same amendments also allow for financial assistance from the state (subsidies) to be made to private companies and corporate bodies involved in these activities.

In Latin America, public wholesale markets constructed between the 1960s and 1970s (e.g. for São Paulo, Mexico City and Bogotá) have failed to keep pace with new developments in food marketing, such as the emergence of supermarket chains. Infrastructure in these locations, and in Caracas and some Central American capitals, have now deteriorated. In other locations, such as La Paz, Bolivia, initial enthusiasm for wholesale markets has not been carried past the feasibility stage.

In PRC, however, wholesale markets play a more central role, increasingly recognized as essential components of the produce marketing system, with markets established in every major town and city. In other parts of Asia, wholesale markets face considerable problems. In Lahore, Pakistan, for example, only one of the four wholesale markets established is functioning properly¹³³.

The constraints on developing and maintaining wholesale markets are considerable. These include:

- their status as low-priority infrastructure for municipalities, leading either to underfunding from the state, or to being viewed as an entirely commercial venture;
- increasing congestion problems for transportation vehicles, with markets now located in inaccessible inner city locations, given the expansion of urban areas in recent years;
- poor berthing, storage and drainage facilities;
- lack of water and sanitation facilities, and a general lack of hygiene;

Box 6.1 Physical attributes of wholesale markets and other trading centres¹³⁴

- a raised, well-drained site, safe from damage by surface or seepage water and not subject to floods or inundation;
- an area away from the residential locality, factories and other industrial establishments, dairy and poultry farms, kilns, other sources of fire, garbage dumping grounds, slaughterhouses, hide curing centres, etc.;
- an operationally advantageous position taking into account the infrastructural facilities, such as a network of roads, railway, river navigation, banking, and communication facilities;
- sufficient parking and manoeuvring space for vehicles;
- scope for future expansion and adequate free land available in the adjacent areas;
- access to adequate and dependable source of water, electricity and public transport system;
- free from legal hurdles to take up proposed constructions.

- poor packaging facilities;
- lack of display space.

Conversely, some of the physical attributes of an efficient wholesale market and trading centres are given in Box 6.1.

6.1 BUILD-OPERATE-OWN / CONCESSION WHOLESALE MARKETS

Examples to support this study of PPPs in developing wholesale markets have been difficult to find. The two cases commissioned for this report are both located in Eastern and Central Europe, one in the Ukraine, the other in Poland. With liberalization and democratization in Eastern and Central Europe in the 1980s came significant interest by the state in developing wholesale markets to meet the needs of the newly privatized farming sector to benefit from competition. The two cases are summarized below.

6.1.1 Kopani and Gdansk wholesale markets^{135 136}

The Kopani wholesale market, in Kherson, southern Ukraine, has a current capacity of 700–1 000 trucks per day, bringing 500–3 000 tonnes of fruit and vegetables for trading. The Gdansk Wholesale Market in Poland – trading in fruit and vegetables near to Gdansk, Gdynia and Sopot in northern Poland – is in its early stages of development.

The Kopani market is located in an area of high growth potential, well known by regional producers and accessible to international traders from the Russian Federation, Belarus and the Baltic States. The Polish Gdansk is likewise strategically located near to three cities, and close to a major ring road. Table 6.1 compares the two cases, as far as the available information allows.

Table 6.1 Comparison of Kopani and Gdansk wholesale markets

Component	Kopani Wholesale Market, Ukraine	Gdansk Wholesale Market, Poland
Infrastructure	<ul style="list-style-type: none"> Physical structure, focus on producer-assembly (unclear if newly-built or use of existing structure/s). 50 employees – managers, controllers, accountants, loaders. 	Physical construction of new market facilities.
Traded produce	Fruit and vegetables	Fruit, vegetables, flowers, dried products
Ownership	100 percent private ownership (owner-operator).	Public-private joint stock company (SPV) owned by market traders and private banks (50 percent); municipality also a shareholder (assumed).
Financing	US\$150 000 equity (est), no information on loan capital or extent of debt leverage.	<ul style="list-style-type: none"> Equity (land asset) – 50 ha land contributed by state Agricultural Property Agency (ARP) to SPV “in-kind” (nominal value US\$1/m² = US\$5 million). Equity capital – 50 percent from wholesale market traders (via public offering) and one private bank; remainder from state agencies (unspecified) Loan capital – (i) WB foreign currency loan of US\$19.5 million for construction (terms: 0.5 percent above the London Interbank Offered Rate (LIBOR), 15 years, five-year grace on principal), (ii) ARP – capital contributions (amount unknown); (iii) Agency for the Modernization and Restructuring of Agriculture (ARMA) – capital contributions and concessional loan (unspecified)
Land ownership	Land rented from state – 49-year lease.	Land grant – 50 ha (asset value = US\$5 million at US\$1/m ² ; US\$200 million at US\$40/m ²).
User fees	US\$2 to US\$10 per truck (at average of 850 trucks per day, and six months per year, revenues equates to US\$260 000 to US\$1.3 million p.a.).	Unknown
Operation	Seasonal only.	Assumed year round.
Subsidies	None, tax relief proposed in draft Law on Wholesale Markets.	See land grant above.
Imports sharing market space	The Russian Federation, Belarus and the Baltic States.	Unknown.

6.1.2 Build-Operate-Own (BOO) / concession wholesale markets: model components

Drawing on the two cases above, with assumptions of the means taken to mitigate the principal political and commercial risks, a generalized model of a BOO/concession for wholesale market is deduced (Table 6.2). Lessons learned from implementing the model in Poland and Ukraine follow the model.

Table 6.2 Build-Operate-Own / concession for a wholesale market: model components

PFI component	Characteristics
Strategic purpose	<ul style="list-style-type: none"> • Provide outlets for farmers to market their produce. • Improve price transmission and quality information from export and urban markets, leading to increase in domestic competitiveness and wider range of domestic produce.
Infrastructure coordination	<ul style="list-style-type: none"> • Wholesale market infrastructure might include ancillary facilities to extend marketing and improve trade, e.g. washing and packaging, quality testing laboratories, cold storage, market analysis telecommunications communication (to compare prices), vehicle and machinery servicing. • Parallel public (or private) investment in utilities infrastructure likely to be essential, e.g. access roads, electricity and water supply, drainage, waste management.
Organization	<ul style="list-style-type: none"> • SPV, with predominance of private equity. • Regulator to oversee trading and quality standards of marketed produce. • If state subsidies involved, then project management unit to approve performance-based disbursements.
Resourcing	<p>Types:</p> <ul style="list-style-type: none"> • State land grants (or concessional acquisition price). • Capital subsidies for infrastructure construction, e.g. from central government, donors or municipalities, either raised by SPV or by state/municipalities. • Private and DFI equity, options for equity from traders and municipality (e.g. municipal bonds).
Cost recovery	<ul style="list-style-type: none"> • Trader user fees: (i) volume of commodities traded by vehicle or weight, (ii) fees for stands or trading space; (iii) fees for storage and other ancillary services; (iv) fees tied to the value of transactions. • Indirect sources of income: (i) development of land for sale or sub-leasing, e.g. for distribution facilities, warehousing, retail; (ii) advertising revenues.
Contractual arrangement	<ul style="list-style-type: none"> • BOO concession (ownership of built assets only, or land + built assets). • Negotiated or competitive bidding for SPV, the latter with least-cost subsidy bidding. • Facilities construction and maintenance contracts competitively bid by owner-operator.
Risk	<ul style="list-style-type: none"> • Demand risk, e.g. volume of traded commodities, subscriptions, etc. • Foreign exchange risk if DFI or donor funding.
Regulatory framework	<ul style="list-style-type: none"> • Regulatory authority to oversee international health and hygiene standards (to ensure domestic produce competes with imports for export or urban markets). • Flexible regulatory framework to allow indirect revenue to be generated from development of leased/acquired land assets, with state rezoning as required.

6.1.3 Lessons

Improved marketing

Covered markets and trading centres, especially those that bring imported produce in proximity to domestic production, carry significant opportunity to improve competitiveness for both export and domestic urban markets. Farmers and traders can experience precisely which products, and what level of quality and packaging, is required to compete. For example, a notable effect in the Kopani wholesale market in the Ukraine has been the improvement in

client-oriented production and packaging by domestic producers in response to exposure to foreign competition. Data on this impact for the Kopani project is not forthcoming, but in another wholesale market – in Pozan, Poland – domestic traders report a 30–40 percent premium on the price of domestic carrots if washed and packaged in accordance with the same standards achieved by Dutch importers sharing the same wholesale facility¹³⁷.

Price transmission

Wholesale markets and other trading centres bring the forces of comparative pricing to bear on agricultural inputs and sales, enhancing the prospect of farmers securing fairer deals than might be achieved by purchasing or selling through single traders. Further, more accurate pricing information and knowledge of the wider trends on the cost of agricultural inputs – fertilizers, seed, herbicides, etc. – provide farmers with greater confidence to make investments and improve productivity.

There is currently a debate as to whether farmers need wholesale markets at all, given the expansion of vertically integrated distribution arrangements promoted by supermarkets and chain stores¹³⁸. This is predominantly a developed work phenomena. In many developing countries and Central and Eastern Europe, and in probably all least developed countries, the fragmented and cooperative nature of farmer groupings means that wholesale markets provide a valuable source of information on price and quality standards that improve competition. In particular, it has been noted that “the high rates of urban growth in African and Asian developing countries, will continue and will create a need for both expanded and new wholesale markets, especially in the rapidly expanding ‘secondary’ cities in many countries”¹³⁹.

Additional income from land development

A key constraint on development of the Gdansk Wholesale Market has been the reluctance of traders to move from the existing bazaars, because of the vested interests of individuals in the municipality (the flower market is functioning at only 20–25 percent capacity)¹⁴⁰. To compensate for the slow development of the project, land owned by the SPV has been both leased and sold to raise revenue, with land prices now at US\$40/m².

As the Gdansk case illustrates, the demand risks associated with wholesale markets, and the opportunities for indirect revenues from land development, suggest a need for close attention to both these aspects. On the latter, if land ownership remains with the state or municipality, then the regulatory framework might be adapted to allow the on-leasing of land under the concession to other private parties, for example, through appropriate land-use rezoning. Care will need to be taken with the pricing of these lease arrangements so as not to contribute to criticism that private ownership or concessional development of government land used for wholesale markets is exploitative of the state.

With high demand risks and not insignificant capital costs, the advantage of enabling land development and on-leasing or sale provides an important alternative source of revenue, which in turn may be used to reduce financing costs, rendering the project more attractive to private investors.

7. Public-Private Partnerships and agroprocessing facilities

Agroprocessing facilities that add value to products produced by private sector farmers are essentially commercial ventures. They include: facilities for freezing and processing meat and fish; milk cooling and dairy processing; cereal milling and refining plants; fruit processing; and various forms of bottling and packing. There are many circumstances in developing countries where the provision of such facilities would not take place if left to the free market, and yet their development and efficient operation could be considered a “public good”, not least in the form of improved farm income, employment opportunities, food security and tax revenues. Further, a possible 20-year global bull market in dairy products, horticulture and cereals¹⁴¹ is a national economic opportunity for those developing countries that can meet the expectations of export markets on quality, volume, reliability and packaging. More generally, many developing countries are still dependent on agriculture for their economic well-being because of failure to compete in manufacturing, the slow development of the services sector (leisure, finance and construction) and a dependency for foreign exchange on the volatile mineral extraction sector.

As well as aiding access to new urban and international markets, agroprocessing facilities are a means to prevent economic losses. Post-harvest losses in Africa average around 50 percent for fruits, potatoes and vegetables, twice that of developing countries as a whole¹⁴² (losses in India are 20–30 percent¹⁴³). In the absence of a cold storage and related cold chain facilities, farmers are often forced to collectively sell their produce immediately after harvesting, resulting in low prices. Ten-year economic returns for investment in post-harvest and related infrastructure in Africa, such as refrigeration, are estimated at around 500 percent¹⁴⁴.

Models of PPPs for developing and operating agroprocessing facilities follow. Three models are considered, drawing on case material from a farmer-NGO operated milk processing plant in Kenya, a post-harvest facility for eradicating fruit fly in Fiji, and a multiservice agricultural processing and trading centre in the Lebanon.

7.1 AGROPROCESSING PLANT: FARMER-NGO JOINT VENTURE WITH PUBLIC SUBSIDY

Many rural areas have a high potential for milk production, but lack facilities to collect, process, transport and market the product, causing production to be wasted or undeveloped. Small-scale dairy farmers, even if formed as a cooperative, rarely have the capacity to raise affordable loan and equity capital for investment in land acquisition and processing facilities, or have the technical and financial expertise to conduct feasibility studies or operate such complexes. Likewise, their capability to market in bulk is also limited.

7.1.1 Siongiroi Dairy Plant Limited (SDPL), Kenya¹⁴⁵

The Siongiroi Dairy Plant Limited (SDPL) is a milk collection, chilling, marketing and transportation facility for small dairy farmers in three subdivisions of the Bomet District, Rift Valley Province, Kenya. The plant is a joint venture between United States-based NGO Heifer Project International (HPI) (40 percent equity) and a dairy farmers' cooperative (60 percent equity) – the Siongiroi Dairy Farmers Cooperative Society (SDFCS). The SDFCS has 2 138 members, all small-scale dairy farmers, of whom 724 have paid in shares to SDPL. As well as cooling equipment, the plant also operates a 12- tonne milk tanker and a veterinary service. The facility became operational in 1998. At the time of writing it had a cooling capacity of 30 000 litres/day, with milk production at 28 000 litres/day.

Bomet Municipal Council granted land for the original facilities and provides regulatory services to ensure quality control. Grant capital was provided over three years by the USAID Smallholder Dairy Enterprise Development Programme. Other features of the project follow:

- The presence of the facility has led to growth in the demand for milk and complementary milk products in the local urban centre of Siongiroi. This is significant because it demonstrates the potential effect of strategic infrastructure on the development of new “local” markets, in contrast with its role in enabling farmers to compete in existing, larger and more distant urban or international markets.
- Extension training provided by HPI (including fodder management and artificial insemination) and diffusion of best practices between farmers have improved dairy production methods and raised productivity.
- The achievement of volume production by SDPL has facilitated a significant purchase agreement from an upstream milk processing company in Nairobi, providing a market for farmers and incentivizing on-farm investment in improved production.
- Farmers who have paid in capital to SDPL have benefited from a dividend payout (unspecified).
- Economic multiplier effects of the plant include employment opportunities for farm workers, milk transporters and retailers selling farm inputs to meet the surge in dairy production. It has also been noted that the facilities have contributed to *“food security in the area (with) ... residents no longer dependent on relief food from the government”*¹⁴⁶.

7.1.2 Farmer-NGO joint venture with public subsidy: model components

Table 7.1 draws on the joint venture construct between HPI and the SDFCS to present a PPP model for developing a local agroprocessing facility.

Table 7.1 Agroprocessing: Farmer-NGO joint venture with public subsidy: model components

PFI Component	Characteristics
Strategic purpose	Incentivize growth in a particular agricultural sector or subsector through the development of local, market-oriented, agroprocessing facilities.
Infrastructure coordination	Water for irrigation and livestock, feeder roads to the processing facility, and development of local agroprocessing facilities further up the value chain.
Organization	Joint venture (SPV) between farmers' cooperative and a private entity (for-profit or not-for-profit). The private party to be technically and managerially competent and able to raise or secure affordable capital, and manage commercial risks.
Resourcing	<ul style="list-style-type: none"> • Equity in joint venture raised from (i) private entity (ii) farmer cooperative members (farmers can elect to contribute share equity, but all must pay a registration fee). • Capital subsidy from the public sector or donors (e.g. land grant, capital grant). • Concessional debt (e.g. donor sourced), secured in part against long-term contracts with upstream processors. • Private entity (or third parties) provide credit risk guarantees to improve debt terms.
Cost recovery	<ul style="list-style-type: none"> • User fees collected on basis of volume of milk delivered (deducted from payments).
Contractual arrangements	<ul style="list-style-type: none"> • Long-term "captured" contracts with upstream processors. • Equity from farmers ensures loyalty to processing facility.
Risk	Demand risk owing to (i) seasonal climatic risks (mitigated by developing alternative sources of revenue, e.g. invest in processing of other commodities, land development), and (ii) long-term, secure priced, contracts with upstream processors (but can incentivize farmers to sell to local traders for higher price).
Regulatory framework	<ul style="list-style-type: none"> • Regulatory authority to oversee health and hygiene standards of facility. • Flexibility in terms of land grant (if relevant) to enable generation of alternative income, e.g. wholesale market development, land resale.

7.1.3 Lessons

Third-party private capital

Situations where farmers are able to raise their own capital to finance agroprocessing infrastructure is likely limited to all but the most commercial farms. The problem is compounded where the proposed facility depends on a single commodity grown by small-scale farmers carrying high levels of production risk (such as in the SDPL project). Capital subsidies from the state (in the form of land or grants) and concessional donor finance, are part of the solution. Complementing farmers' paid-in capital with that from a second, established, for-profit or not-for-profit private entity is another. This role could be played by either a for or a not-for-profit private entity (such as the NGO HPI). Critical is that this private party should (i) bring access to technical and managerial expertise related to the development and operation of the process facility in question, and (ii) have a capability to raise affordable finance, be that through its own contribution of equity and access to loans on affordable terms and/or by offering (or arranging) credit guarantees. In effect, this model is a variant on the irrigation PPP model (see Section 5.1) that places a commercially competent third party between the producing farmers and the market.

Infrastructure coordination

The Siongiroi Dairy Plant project demonstrates the importance of infrastructure coordination. In the project region, water supply and its transportation to livestock areas, is limited, requiring farmers to herd their cattle to distant water points during the dry season. Further, the benefits of the secure market provided by the fixed, long-term contract with the urban milk processing plant in Nairobi is challenged by the higher prices that farmers can secure from local traders, i.e. there would seem to be a need for more local upstream milk processing capacity. Finally, the poor quality of feeder roads within the Siongiroi Plant's catchment area increases the cost of delivering milk to the plant. This further fuels the benefits to farmers of selling their milk direct to local traders who collect from the farmgate. In planning the use of public resources to support investment in agroprocessing facilities, consideration clearly needs to be taken of the parallel public investments in supporting infrastructure.

Reducing demand risk

As noted, agroprocessing plants that depend on a single product, with the commodity produced by small farmers on land vulnerable to climate variations, are highly risky. Achieving a very high debt to equity ratio in financing the project may provide comfort to lenders and improve loan terms. Alternative solutions involve public investments in infrastructure in other parts of the value chain to reduce supply vulnerability; developing additional processing capacity aimed at a different commodity (with the choice being one that hedges the climatic and other production risks); or raising revenues in other ways than processing, e.g. through land development. Although agroprocessing facilities do indirectly generate public goods, they are viewed essentially as business-to-business private operations. It is therefore unlikely that the raising of debt, and the high risks of repayment, could be transferred to a public body (as an earlier example in this report has sought to do).

7.2 DEBT-FREE AGROPROCESSING PUBLIC-PRIVATE PARTNERSHIPS TO MEET MARKET STANDARDS

Exports of agricultural produce to developed country markets face significant quality standards. In addition to the potential human health impacts, the recipient country's domestic production can be put at risk. In recent memory, both Australia and the United States have suffered adverse economic consequences from diseases and pests brought into the country through agricultural imports of fruits and vegetables. Regulatory authorities and donors already contribute directly and indirectly to private agroprocessors in terms of research, extension services and product testing, viewing these services as a public good (or near public good) designed to expand a country or regions exports. State authorities and donors working in partnership with private operators to share the costs and risks of extending this type of quality control to the physical treatment of pests and disease carry the same public interest.

7.2.1. Fruit Fly Treatment Facility, Fiji¹⁴⁷

Fruit flies are major pests of fruits and vegetables in the Pacific and a constraint to the export of these commodities to markets in Australia, New Zealand and the United States. One form of treating this produce for export is through a High Temperature Forced Air (HTFA) process, compliant with import requirements for quarantine treatment. The HTFA process – five to six

hours of slow heating at around 47 °C – also adds to the shelf-life of fruit. The capital costs of a HTFA treatment chamber, together with a packing shed and other ancillary equipment, are around US\$500 000 to US\$1 million. As with other agroprocessing facilities, the demand risk (in this case the unpredictability of throughput volume) makes such investments risky. Further, for a small country, such as Fiji, the scale of possible exports works against a fully commercial investment model.

The Fiji HTFA quarantine treatment facility is a PPP between an owner-operator – Nature’s Way Co-operative Limited (NWC) and the Fiji Ministry of Agriculture, and USAID. NWC was established in 1995 representing Fiji’s fruit industry, both its growers (of papaya, mango, eggplant and breadfruit) and its exporters. NWC currently has 120 farmer and exporter shareholders. Its core function is to treat and package fruit on behalf of its members, all of whom must be shareholders. This is a variant of the Siongiroi Dairy Plant model above, where members can elect whether or not to take equity in the cooperative. NWC is not involved in actual exporting, which is handled by individual exporters. Exporters, like growers, must carry NWC shares to be able to utilize the facility (priced at twice that for farmers).

The USAID, under its Commercial Agriculture Development (CAD) Project, provided grant funds to NWC to purchase the treatment chamber and ancillary equipment (US\$250 000), and also carried an intention to provide initial start-up capital to meet operational overheads and staff training costs in the start-up period (see below). The Ministry of Agriculture provided a capital grant of US\$250 000 to fund the physical structures, and the CAA granted land for the facility (terms of land grant are unknown).

Financial problems were encountered in the first year of operation, with a delay in disbursement of the start-up working capital from USAID. A request was subsequently made to IFC’s South Pacific Project Facility (SPPF) to provide technical assistance to help source new funding of this type, but this was refused on the grounds that NWC was a cooperative, not an incorporated company. “The argument that it was the management rather than business structure that was the key to success fell on deaf ear”¹⁴⁸. Similar rejections were also received from the Fiji Development Bank and local commercial banks.

A notable component of the approach taken by NWC is to forego debt altogether, with the implication that they had no access to working capital at this juncture. Working capital was eventually sourced in grant form from, *inter alia*, the Fiji-New Zealand Business Council and the New Zealand development assistance agency.

Operations at the facility have grown over the past ten years from 30 to 1 200 tonnes. No additional subsidies or financing has had to be secured during this time. A number of factors have been identified as the key to the facility’s success (Box 7.1).

In terms of operations, individual treatment user fees support all operational costs, maintenance and repairs, as well as business expansion, equipment depreciation costs and contingencies. The latter include delays to securing certifications for new products, political trade bans and climatic events.

Box 7.1 Fruit Fly Treatment Facility, Fiji: key success factors

- Quality and continuity of management. The same chairman and general manager have served from the outset.
- No government interference in the operations of the business.
- Role of government confined to the initial provision of capital and the carrying out of core quarantine regulatory functions.
- Shareholders have not interfered in the day-to-day operations of management.
- Quarantine treatment fees have been set at an economic rate from the outset. This has enabled the business to run profitably and retain a sufficient level of earning to fund repairs and maintenance, to invest in the expansion of the business and to make “rainy day” provisions for events, such as cyclones and trade bans.
- The business was able to quickly move to a level of plant utilization that yielded a positive cash flow. The key to this was the introduction of eggplant in 1998 to complement and then surpass papaya.

7.2.2 Debt-free agroprocessing Public-Private Partnership (PPP) to meet market standards: model components

The debt-free nature of the Fiji fruit fly treatment facility offers a marked deviation from conventional PPP financing arrangements. All other models investigated in this report where capital financing is required have taken on debt, either through a SPV or through a public authority. Drawing on the Fiji example, a PPP model utilizing 100 percent public capital subsidies and zero debt is summarized in Table 7.2.

Table 7.2 Debt-free agroprocessing PPP to meet market standards: model components

PFI component	Characteristics
Strategic purpose	Develop agroprocessing infrastructure strategically critical to exporting high-value horticultural produce to international and growing urban (international tourism) markets.
Infrastructure coordination	Feeder roads; farm infrastructure to enable produce diversification relevant to agroprocessing facility; and exporting facilities (freight capacity, storage, refrigeration, etc.).
Organization	<ul style="list-style-type: none"> • Owner-operator industry cooperative (growers and exporters). • Management structure highly competent, and incentivized to make strategic decisions in interest of the wider industry (i.e. the shareholders) rather than lenders and external shareholders.
Resourcing	<ul style="list-style-type: none"> • Farmers contribute equity – required to take equity to use facility. • Exporters contribute equity (at twice the share price of farmers) – required to take equity to use facility. • Public sector (government/donors) provide 100 percent grants/subsidies for all capital costs: building, equipment. • Land provided in grant form, long-lease or BOO/concession. • Zero debt (possibly minor short-term debt facility for start-up working capital).

PFI component	Characteristics
Cost recovery	Treatment fees by users (costs required to cover operations, maintenance, repairs, expansion, depreciation costs and contingencies).
Contractual arrangements	<ul style="list-style-type: none"> • Land lease/grant arrangements with government (details unclear). • No long-term contracts with growers or exporters (details unclear).
Risk	Fixed nature of equipment means business model is inelastic to changes in supply (from growers) or demand (from exporters).
Regulatory framework	<ul style="list-style-type: none"> • Quality control and testing sufficient to satisfy export (or domestic) markets. • Long-term land lease, with flexibility for land development.

7.2.3 Lessons

Governance structure

Inclusion of exporters as equity partners in the owner-operated SPV, along with growers, ensures that an agroprocessing facility develops in a way that aligns with market needs. In particular, the obligation on exporters and growers to take a shareholding if they wish to use the facility presumably helps optimize the competitiveness of the value chain, from growers right through to wholesalers. At the same time, putting in place a high-quality management team, and affording independence to act in the best long-term interests of the industry, have been key.

The financing structure also has an effect on governance. With zero debt, commercial banks are not continually scrutinizing the finances of the facility. There are also no external, non-member, shareholders. Thus, the management team can concentrate on strategic decision that benefits its members and not be driven predominantly by return on investment considerations.

Importance of diversification

Unlike the Siongiroi Dairy Plant in Kenya, which is limited to collecting and treating milk, the Fiji fruit fly treatment facility has applicability to a wide range of produce. This reduces the demand risk to the facility. The economic benefits of diversification can be seen in the part it played in helping NWC move from a negative to a positive cash flow, a change of fortune tied primarily to the inclusion of eggplant as well as the original papaya.

Financing of cooperative structures by Development Finance Institutions (DFIs)

Rejection by the IFC of advances from NWC for assistance in sourcing alternative start-up funding has implications for the financing of agriculture-oriented infrastructure by DFIs in general. Assuming the account given by the case study authors is comprehensive, the deciding factor is that the IFC can only support (with finance or technical assistance) private companies that are “incorporated”. Less than sufficient account was perhaps taken of the underlying commercial viability of the venture. If such a response is typical of the wider family of DFIs, it suggests that PPP models in which farmers’ cooperatives are the sole source of equity would not be eligible for DFI finance. This is clearly an area for future research. Key questions include:

- How do different DFIs treat the financing of limited liability companies that are incorporated vs cooperative?

- Do the same restrictions apply to providing these two types of entities with technical assistance, e.g. from individual DFI TAFs or from TAFs and trust funds that they are responsible for administering?
- What are the restrictions on DFI financing and technical assistance if the owner-operator is part cooperative and part privately owned?

Debt-free status

Part of the ten-year success of the Fiji fruit fly treatment facility venture has been its debt-free status. Because of this status, user fees are able to fully support operations and maintenance, as well as business expansion and contingencies. Replicating this model would require full subsidies for all fixed capital assets (land, buildings and equipment), as well as sufficient start-up working capital to meet overheads prior to the facility becoming licensed and beginning to earn income from exporters (perhaps a period of six months to two years). This start-up working capital could come either from further grants, as in the Fiji example, or by retaining a higher proportion of the equity capital as working capital, or by taking on long-term debt with a sufficient grace period.

Regarding the latter, from a commercial perspective, given the success of the Fiji facility to date, it might be asked whether the most efficient use is being made of the cash position of the owner-operator. Given its absence of debt and its solid history of positive cash flow, leveraging its equity and retained earnings to raise new debt from commercial banks (or more likely regional development banks) would presumably be on favourable terms. This could enable the plant to diversify its business faster, perhaps not only into other fruit fly host commodities, but also in developing the land that it owns for other commercial purposes. Whether land development is possible will depend in part on the terms under which the land was granted, not least (presumably) whether the proposed developments would continue to align with the public interest for agricultural development.

7.3 NOT-FOR-PROFIT DESIGN-BUILD-OPERATE-TRANSFER AGREEMENT FOR MULTIPROCESSING AND TRADING SERVICES

As both the Siongiroi Dairy Plant in Kenya and the fruit fly treatment facility in Fiji both illustrate, financing agroprocessing facilities is risky, with the risks higher the less diversified the range of services on offer. Broadening infrastructure services to include not only specialized agroprocessing but wholesale trading and marketing as well is likely to provide a less volatile flow of user fees and makes the venture more attractive to potential funders. As with the Kalangala “bundled” infrastructure project discussed earlier, however, it also adds significant management complexity.

7.3.1 North Lebanon Agricultural Center¹⁴⁹

The rural population in Northern Lebanon is dependent on the agricultural sector as its main source of income. The Agricultural Center of the North (CAN) in Northern Lebanon is a multifaceted, market-oriented, agricultural infrastructure programme, providing these populations with the following services:

- Training farmers on new and improved agricultural practices: forage production, olive sector, fruit tree production, goat production, nursery production;
- Development of infrastructure to collect, sort, package, clean and store agricultural products;
- Development of processing facilities: milk processing and marketing, ice cream processing and marketing and fresh-cut processing;
- Development of facilities to trade products in local and export markets through a central market and virtual marketing.

The key parties in the programme are the not-for-profit organizations Rene Moawad Foundation (RMF) and Cooperative Housing Foundation (CHF), USAID, and various farmers' cooperatives. The programme falls under a revised USAID project on "Clustering for Economic Development and Revitalization of Industry Sectors".

There is no SPV or for-profit private party involved to act as the focus of raising finance, and no capital financing (i.e. no raising of serviceable debt by private or public parties to fund capital investments). The programme is essentially grant funded by donors to cover capital and start-up costs, with user fees supporting operational costs.

There are two principal agreements governing the programme. First is a Cooperative Agreement between USAID and CHF, governing the transfer of grant funds from the former to the latter. Second is a series of sub-awards between CHF and RMF, facilitating RMF to DBO various infrastructure services, the income from which is intended to cover operational and maintenance costs, including:

- Tariff charged on using the storage facility, calculated per crate of fruits stored;
- Profit earned from processing milk into dairy products;
- Tariff charged on using the sorting and packaging machines;
- Profit from producing and marketing fresh cut vegetables;
- Revenue from forage sales to dairy farmers;
- Revenue from olive oil sales;
- Profit from selling fruit trees transplants;
- Tariffs charged on agricultural services provided to farmers, including ploughing, harvesting, bailing, planting, irrigating and spraying.

The RMF is also charged with developing the capacity of farmers' cooperatives so that they are able to assume the operational management of facilities. The CHF and the RMF are essentially under a DBOT contract arrangement with the USAID.

The Cooperative Agreement suggests that commercial risks for sustaining the operational and maintenance costs of these services are carried initially by the RMF, but ultimately by the CHF. However, once operations have been transferred to producer cooperatives, for example, in the operation of milling facilities, initial liabilities for shortfalls in operational costs will presumably fall to these cooperatives. Responsibility for overall implementation

of the programme rests with a PMU comprising representatives of the two not-for-profits organizations.

7.3.2 Not-for-Profit Design-Build-Operate-Transfer (DBOT) Agreement for multiprocessing and trading services: model component

The relationship between the RMF and the CHF appears complex. It should be possible to combine these roles, and position a single not-for-profit entity as the recipient of grants from donors, or domestic public authorities (e.g. municipalities) under a similar DBOT contract. The model in Table 7.3 below seeks to capture such an arrangement.

Table 7.3 Not-for-Profit DBOT Agreement for multiprocessing and trading services: model components

PFI component	Characteristics
Strategic purpose	Improve the competitiveness of agricultural sector through multiple outcomes: (i) reduced production costs; (ii) strengthened cooperatives, (iii) improvements in production quality and yield, (iv) more cost-efficient distribution channels, (v) new and strengthened domestic and export market outlets.
Infrastructure coordination	Value chain approach to investing in complementary infrastructure.
Organization	<ul style="list-style-type: none"> • Donor (or domestic public authority) makes capital and start-up grants to a not-for-profit (third-party) implementing agent under a DBOT contract, ultimately transferring service management responsibilities and liabilities to farmer cooperatives. • PMU (staff from implementing agency) prepares work plans, manages tenders, approves offers, approves payments, monitors sub-projects.
Resourcing	<ul style="list-style-type: none"> • Grants from public sector for capital and start-up costs. • Working capital contributed by not-for-profit implementing agent (or start-up grants). • Zero debt.
Cost recovery	Tariffs and user fees for services (primarily farmers, traders and processors).
Contractual arrangements	<ul style="list-style-type: none"> • Agreement between principal grant maker and not-for-profit implementing agent. • Management contracts transferring income flows and operational liabilities to cooperatives.
Risk	Demand risk, leading to shortfalls in income to support operational and maintenance costs.
Regulatory framework	<ul style="list-style-type: none"> • Licensing and permitting of various services. • Quality control in agroprocessing.

7.3.3 Lessons

Design-Build-Operate (DBO) vs Design-Build-Operate-Transfer (DBOT)

This model recognizes the need for a competent party to DBO a capital infrastructure programme. This organization needs to be situated as a fourth party between the (inefficient) infrastructure user associations (e.g. WUAs or farmers' cooperatives) and the principal public parties (be they state regulators or donors, or both). In this model, instead of the fourth party being a private infrastructure development company or SPV, established to raise capital and

implement and manage infrastructure in return for commercial gain (i.e. returns on capital investments and financial risk taking), the agent is selected because of its not-for-profit – i.e. non-commercial – credentials. An advantage of this choice is that the terms of the DBO contract can readily include the gradual transfer of infrastructure management to user associations or cooperatives. Under a for-profit commercial DBO contract such a performance outcome would lessen the attractiveness of the programme to the private sector, because its scope to increase revenue over time would be diminished.

Financial risks

What is unclear in this not-for-profit DBOT fourth party model is precisely where the financial risks lie. For the model to work, the Cooperative Agreement between the public grant maker and implementing agent would need to specify what happens if user fees are insufficient to cover operational costs (including maintenance, repair, depreciation and contingencies). The same clarity would be needed when transferring infrastructure management responsibilities to farmers' cooperatives or other user associations.

8. Public-Private Partnerships for information and communications technology

In Section 3.2, the relative commercial attractiveness of private investments in rural mobile communication network equipment and operations was contrasted with less attractive investment opportunities in mobile phone base-station and relay towers (with their longer periods of capital cost recovery and higher risks). In India, this contrast is evident from certain operators rejecting subsidies for network equipment under recent least-cost subsidy bidding rounds for rural areas. For one such competition, in 38 of the 81 regions on offer, mobile operators bid zero; and in 15 regions, India's biggest operator, Bharti Airtel, bid less than zero, i.e. they offered to pay for the privilege. Thus, only around 25 percent of the US\$920 million of available subsidy is likely to be drawn upon¹⁵⁰. India, it seems, is joining other developing countries, such as Nigeria and South Africa, where commercial mobile networks are expanding into areas previously not considered commercially viable.

Figure 8.1 demonstrates the broad attractiveness of the telecommunications sector to the private sector, compared with other infrastructure sectors. For example, in sub-Saharan Africa in 2004, telecommunication infrastructure projects with PSP took around 90 percent of the total infrastructure market. But circumstances are changing, with coverage already fairly comprehensive on a global scale, and fully commercial investment opportunities declining. One estimate puts global cellular communications coverage at 80 percent of the world's population by as early as 2010. In 2006, there were already 2.67 billion current cellular subscribers¹⁵¹, up from 640 million in 2000 (a rise of 417 percent in six years).

Figure 8.1 Investment in infrastructure projects with private participation in sub-Saharan Africa 1990–2004 (US\$bn)¹⁵²

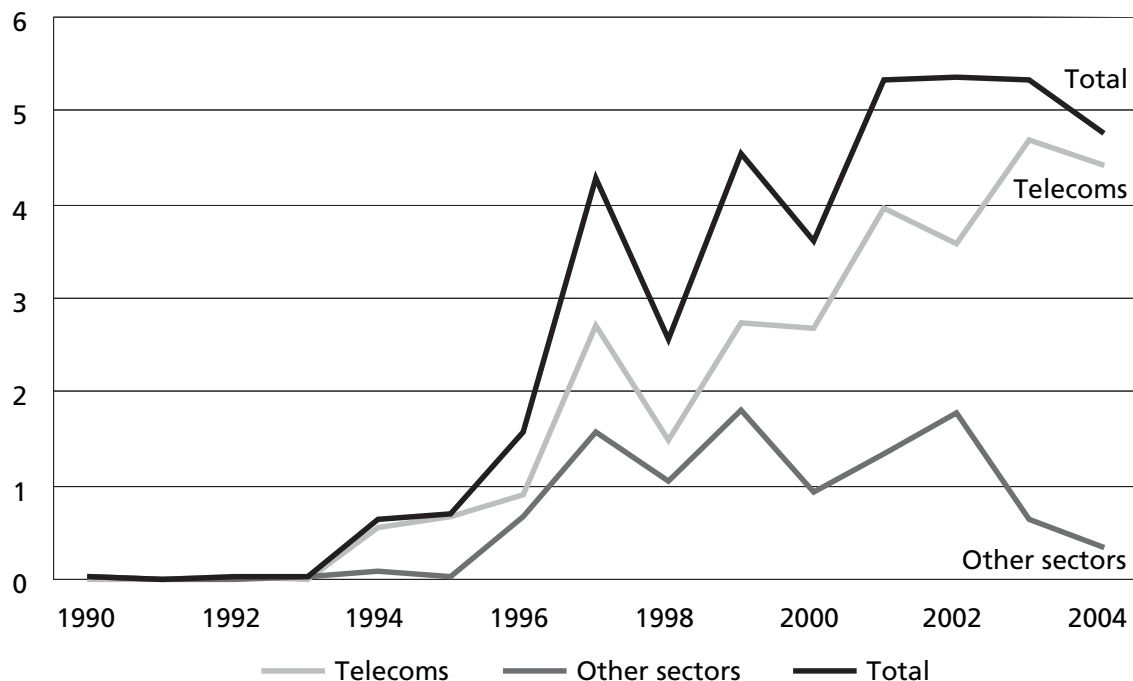
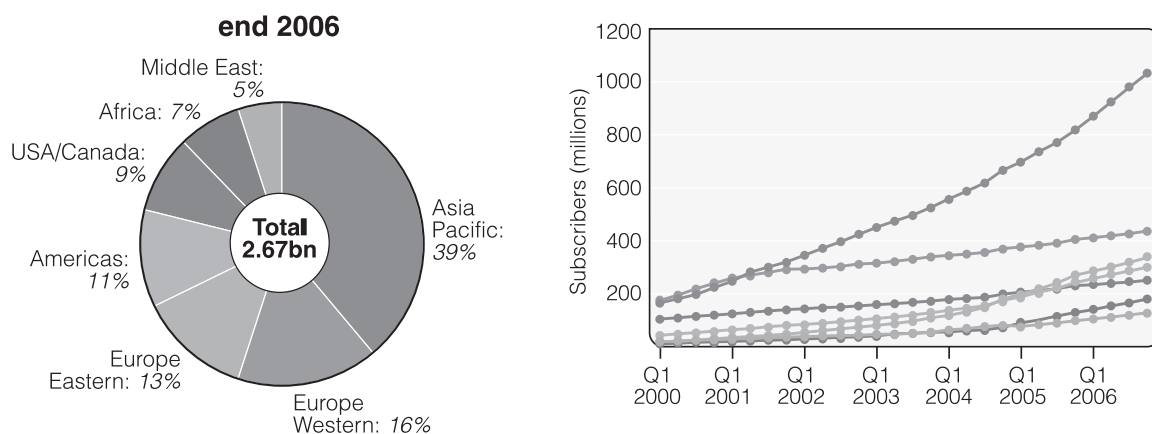


Figure 8.2 Global cellular subscribers and growth by region¹⁵³



With global coverage already high – including rural areas – and with cellular networks in the remaining rural areas increasing and seen as purely commercial propositions, at least two telecommunication infrastructure challenges remain that might involve some sort of PPP arrangement. These are: (i) how to finance physical telecoms infrastructure in remote rural areas (base-stations, relay stations and land-based lines for broadband connectivity); and (ii) how to utilize ICT infrastructure in value chains to stimulate market-oriented economic growth, especially of small-scale farms. The first of these challenges is answered in part through the process of least-cost subsidy auctions described in Section 3.2.2. and Box 3.6. The second is illustrated through a case study and related PPP model below.

8.1 INFORMATION AND COMMUNICATIONS TECHNOLOGY INFRASTRUCTURE FOR A “VIRTUAL” OUTGROWERS PROGRAMME

A critical factor inhibiting agricultural development in many low-income areas is the low level of information that small-scale farmers have about the standards of potential buyers, and the availability and application of agricultural inputs to meet these standards.

A second factor is one of “scale”. Farmers know that if they cooperate they can achieve better credit terms with which to purchase supplies, and can negotiate longer-term, purchase contracts from commercial buyers such as agroprocessors or wholesalers. The problem is that achieving this type of cooperation is difficult without access to the right market information at the right time. Purchasers and suppliers of agricultural inputs are also reluctant to deal with individual farmers unless they are organized, and collectively able to meet quality standards and purchase inputs in bulk.

Essentially, what is needed is a means to bring together the key elements of an outgrowers’ programme, i.e. farmer coordination to achieve the volumes necessary for agroprocessors, access to affordable credit, extension services to help meet quality standards, timely supply of pre-specified agricultural inputs and secure purchasing arrangements.

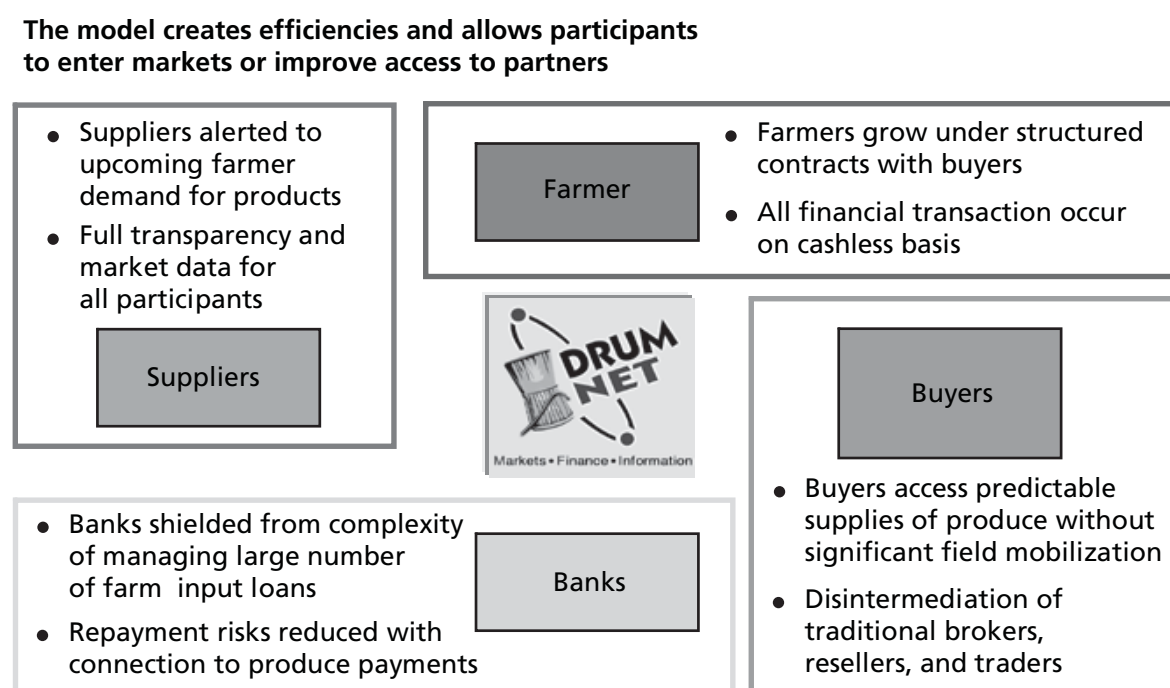
8.1.1 DrumNet Project, Kenya¹⁵⁴

DrumNet is a project of the NGO “PRIDE AFRICA”. Although not communicated as such, the DrumNet project in Kenya is essentially a “virtual” outgrowers programme – an ICT-driven SCM system that assists farmers to cooperate in meeting the quality standards and volume requirements of purchasers. The programme targets farmers in Kenya with land holdings of up to two acres, typically growing a mixture of subsistence (cassava) and cash crops (sweet potatoes, animal feed, etc.), i.e. farmers slightly above or below the poverty line. The business model is essentially in two parts:

- Financial – Farmers are able to access microcredit for agricultural inputs (specified by purchasers) on affordable terms. This is achieved by securing long-term contracts with commercial purchasers with guaranteed prices. These contracts have significant credit value with commercial banks because of the high credit standing of the buyer.
- ICT platform – Communication technology is deployed to link information about the standards required by major purchasers to producer groups and to suppliers of

agricultural inputs (see Figure 8.3). Under the DrumNet model, this information, along with data on credit flows, transactions and accounting, is brought together into a single ICT SCM system as if different parties “were the departments within a single company”¹⁵⁵. The system is cashless. Farmers’ sales of produce to purchasers result in the immediate transfer of proceeds to a single purpose cash management account managed by DrumNet. From these flows, the farmers’ obligations on interest and loan principal are subtracted, along with service fees to DrumNet, payments to suppliers and stockists, and any other obligations specified in the contract between DrumNet and the farmer groups. The balance is transferred to the farmers’ own accounts.

Figure 8.3 DrumNet ICT-driven agricultural supply chain and microcredit management system



The communications technology used by the project combines mobile phones (for communications and transactions) and a dedicated management information system (MIS). The MIS, developed and managed by DrumNet, but resourced by public and private donors, captures and processes data on financing and transactions between players: farmers’ groups and banks, farmers and buyers, farmers and suppliers, DrumNet and farmers. Its role is to reconcile, analyse and report the chain of input delivery events, credit drawdowns, product delivery events, invoices, payments, fees, commissions, and other financial flows and transactions.

With regard to the project’s organization, farmers first register as self-help groups. Each group nominates one of their number as transaction agent to represent them in transactions. These agents also operate rural collection points, receiving produce from member farmers and facilitating the grading, packing and issuance of receipts by the buyer’s agent. Transaction agents also provide basic information to member farmers. For these part-time services, the

transaction agent is paid a small commission. Beyond this he is responsible for all DrumNet communication, production and banking activities by his group of farmers.

The self-help farmer groups enter contracts with a buyer to grow and produce the variety of the crops required and to follow such agronomic practices and use of agricultural inputs as the buyer stipulates. Farmers take short-term credit from the participating banks, provide the necessary security for the loans required, and repay loans from crop sales. Each farmer is required to contribute to a Transaction Insurance Fund at 25 percent of the value of the loan. Each farmers' group opens a bank account with the participating bank through which all payments are made. The system is essentially cashless.

DrumNet also certifies farmers' production systems, and subcontracts extension training services to assure buyers that farmers are using the inputs specified. The project also certifies the various input suppliers and stockists, again to ensure compliance with buyers' specifications.

Funding for the project essentially falls into two parts: research and development and full-scale operations. Phase 1 – research into the basic ICT-platform and business model, its testing and development as a pilot programme – was funded by grants to PRIDE AFRICA from the WB, the Canadian International Development Research Centre (IDRC), the International Fund for Agricultural Development (IFAD) and Monsanto (around US\$700 000 in total). Our understanding is that no financial resources were contributed by the Kenyan Government. In Phase 2, to commence in 2007, the project envisages 15 000 smallholders being formed into farmers' groups, and a wider range of buyers with negotiated long-term purchasing agreements. PRIDE AFRICA expects the project to achieve operational self-sufficiency in three years and commercial viability as a SCM business in its own right in five years. It is anticipated that, by this time, the concept will be reaching 500 000 to one million clients throughout Eastern and Southern Africa.

8.1.2 Information and Communications Technology (ICT) infrastructure for a "Virtual" Outgrowers Programme: model component

The research and development phase of DrumNet has been funded for capital and operating costs by donors and philanthropic organizations. With the ICT platform now developed, such research and development would not be needed in the same way again. More relevant, therefore, is to understand the PPP model being proposed to take the project into full-scale operation. Table 8.1 seeks to present what this might look like. The model is predominantly private, with public resources (donor or government) needed only for initial capital investments to customize the ICT platform (e.g. for each new franchisee) and to support cash flow as the new operations work up to being viable.

Table 8.1 ICT infrastructure for a “Virtual” Outgrowers Programme: model components

PFI component	Characteristics
Strategic purpose	Apply ICT infrastructure to create a supply management and marketing system that enables small farmers to achieve economies of scale (for credit and inputs) and meet the standards of commercial purchasers.
Infrastructure coordination	Cellular phone network with coverage for all participating farmers.
Organization	Owner-operator or franchisee (private or not-for-profit entity) licensed to use the ICT-platform SCM system and operate the business model.
Resourcing	<ul style="list-style-type: none"> • Concessional funding or grants for: (i) purchasing ICT equipment, (ii) customizing the SCM ICT-platform and (ii) staff overheads. • Alternatively, equity capital could be raised from private investors and DFIs, or the franchisee could raise its own debt finance (the latter would most likely require credit risk guarantees). • Short-term credit line to farmers from local participating banks, secured against self-liquidating purchaser contracts with farmers’ groups, where banks command first claim on sales proceeds. • Credit risk guarantees taken by franchisee (or third party) on behalf of farmers’ defaults. • Transaction Insurance, paid by farmers at percent of credit advanced.
Cost recovery	<ul style="list-style-type: none"> • Farmer membership fee. • Credit spreads (shared with bank). • Credit risk guarantee fees. • Brokerage fees for securing long-term contracts (e.g. 10 percent of transaction value).
Contractual arrangements	<ul style="list-style-type: none"> • Contractual obligations between franchisee and farmers’ groups. • License fee to use and customization of SCM ICT-platform. • Long-term purchase agreements with buyers. • Bulk purchase supplier contracts, meeting buyer specifications for seeds, etc. inputs.
Risk	<ul style="list-style-type: none"> • Credit risk to commercial banks, mitigated by (i) transaction Insurance at 25 percent; advances, (ii) secured against purchasing agreements and first claim rights. • No insurance cover to protect farmers’ income.
Regulatory framework	<ul style="list-style-type: none"> • Legal framework to formalize and register farmers’ groups. • If model grows significantly, then a dedicated regulator may be needed to guard against price fixing to the detriment of farmers, or to exclusionary practices that harm farmers who are not participating in these purchase agreements. • Possible independent arbitration service.

8.1.3 Lessons

The lesson below on the DrumNet project and related PPP model focuses only on the role of the telecommunications infrastructure.

Economies of scale

The SCM ICT-platform enables large numbers of farmers and transactions to be handled quickly, efficiently and with a minimum of social conflict. This raises the confidence that commercial banks and buyers have in the ability of farmers to repay credit and deliver products

to standard and on time. Concurrently, the logistics management offered by the technology – i.e. working backwards from purchasing volumes and production standards to required inputs – helps to anticipate bottlenecks on the supply side and/or avoid inefficient purchasing of inputs by farmers.

Cashless system

The ICT-platform enables transactions in the supply chain to be cashless. This brings a number of benefits. The Transaction Insurance Fund is not a unique component of this project, but is quite likely made more efficient by the ICT-platform, in that farmers are less likely to contribute to such a scheme if they have to do this from funds already assumed as part of household income. In the same vein, deductions of interest and principal payments direct from product sales reduce the risk of farmers' defaulting on debt repayments.

The ICT-platform, coupled with the agreements struck between the franchisee and the banks, means that payments for inputs to suppliers are even more immediate, because these are charged to the farmers' line of credit and do not need to await the sale of produce. Overall, the ICT-driven SCM system provides farmers with increased liquidity, enabling rapid and efficient transactions and minimizing the opportunity for cash to be diverted to other purposes. The speed of these transactions is a key feature of the project, and would not be possible without the ICT platform.

8.2 MULTISTAKEHOLDER INFORMATION AND COMMUNICATIONS TECHNOLOGY IN PUBLIC-PRIVATE PARTNERSHIPS FOR POVERTY REDUCTION

The Global Knowledge Partnership (GKP) recently commissioned a study into the role of multi-stakeholder partnerships in bridging the “digital divide”¹⁵⁶. The cases investigated were designed in all or in part to overcome some of the persistent challenges in achieving connectivity in poor areas, including:

- Ineffectiveness of the regulatory regime to attract new investment;
- Design of PPP arrangements with the private sector that fail to deliver affordable ICT solutions to the poorest;
- Unprofitable business models for rural ICT access;
- ICT strategies that fail to exploit the full diversity of available technologies;
- “Content” (e.g. on the Internet) that is not relevant to the livelihood and farming priorities of rural communities.

Although ICT projects – telephony and Internet – are rarely directly targeted only at agricultural communities (the DrumNet project is a clear exception), there is often an effort in rural areas to include “content” of relevance to the promotion of agricultural development, such as weather reports; transport; market and agricultural input prices; and support for small-scale on-farm and off-farm businesses, such as navigating government approval processes, finance and production quality standards. A summary of two of the more relevant cases from the GKP investigation are given below.

Table 8.2 Case studies of multistakeholder PPP ICT projects¹⁵⁷

Dikahotole Digital Village, South Africa	Grameen Village Pay Phones, Bangladesh
<p>Development aims Dikahotole, a community of 8 000 just outside of Johannesburg, suffers from 30 percent unemployment, deficiencies in water supply, electricity and housing. Many families are female headed. The partnership project has three aims: (i) provide young people from the Dikahotole community with training in basic computer, Internet, business skills and employability skills with the aim of improving opportunities of employment and entrepreneurship. Training is to be provided through the "Dikahotole Digital Village", a telecentre with 90 Internet-enabled workstations; (ii) develop the computer resources and skills in the region's schools, train teachers and pupils in computer skills and upgrade and install computers and Internet facilities within schools; and (iii) train local government employees in basic computer and Internet skills, and install computers in the workplace to allow effective communication and information sharing.</p>	<p>Development aims The Village Pay Phone (VPP) programme of Grameen Phone (GP) and the Grameen Bank (GB) seeks to expand rural connectivity as a means of economic empowerment – particularly of poor women. Bangladesh is one of the world's least-wired countries, with very little rural access. The long-term goal is to place a phone in each of Bangladesh's 68 000 villages.</p>
<p>Partners, drivers and contributions</p> <ul style="list-style-type: none"> • Hewlett Packard (HP) South Africa: HP's e-corporate inclusion initiative, of which the Dikahotole Digital Village is one project – is a way to pilot new solutions to eventually increase revenues for the company's current lines of business while promoting economic development in emerging markets. HP is donating much of the computer and other equipment to the Digital Village, providing training to teachers and pupils in essential computer skills and upgrading and installing computers and Internet facilities within schools. • Organization for Rehabilitation and Training (ORT) South Africa: coordinating the project and providing the project management, training and placement services. • Microsoft: a similar driver as HP, and contributing software. • Macsteel: with a view to potential recruitment and satisfaction of community outreach policies, the South African industrial steel producer is providing the training room and related offices. • Local schools: The project will provide access via the Internet to additional learning materials as well as training for pupils in learning and future employability skills. Staff are likely contributing much free time to the project. • Local government authorities: There are likely to be efficiency gains for government from an enhanced capability to share information. Staff are likely contributing time both in and out of office hours. 	<p>Partners, drivers and contributions</p> <ul style="list-style-type: none"> • GP: A commercial organization – with four institutional owners including Grameen Telecom (see below) and companies from the United States, Norway and Japan – which is now the country's dominant mobile phone service provider in both urban and rural areas. GP contributes access to its existing infrastructure network and technology at a concessional rate. • Grameen Bank/Grameen Telecom: The GB is an NGO specializing in rural microcredit with a presence in 35 000 villages in Bangladesh. Grameen Telecom (GT) is a non-profit subsidiary of GB that handles telecommunications programmes. GB leverages its extensive presence and programme in rural areas to operate the VPP, to provide detailed knowledge of rural customers, expand effective economic demand for phone services and provide credit for handset purchase. • Individual women micro-entrepreneurs – one in each village – are provided with a handset on credit, and trained to extend services to the whole village as a microbusiness.
<p>The partnering process It has not been possible to find information on the process of partnership formulation, or whether a formal, or informal, partnering agreement has been signed laying out the division of roles and expected benefits.</p>	<p>The partnering process This is a private/NGO partnership with minimal public involvement (see comment). The primary partners have a close institutional relationship. Both partners were involved in conception and design of the VPP, which sought to deepen the outreach of GPs existing services while also contributing to GB's social development objectives. GP applied for and won a mobile phone license. However, there has been no other overt government involvement in the VPP.</p>
<p>Outcomes and value added The project is in its early phases. It is too early to judge the added value of the partnership over and above what would have happened without the project in terms of assistance to the youth of Dikahotole Village in finding paid employment, the access of teachers to additional learning materials and the benefits of information sharing within local government.</p>	<p>Outcomes and value added The VPP has substantially increased rural access to telecommunications in Bangladesh. By the end of 2001, more than 5 000 villages had been reached – however, progress toward the ambitious goal of the venture has been slower than hoped for because of regulatory and infrastructural bottlenecks. For GP, the VPP is profitable. For GB, the programme contributes to its social goals of increased rural access and economic empowerment of poor rural women, as well as returning a small profit for use in its other operations. Had GP attempted to offer rural services without GB involvement, subscriber uptake would have been much slower because of affordability factors (as is the case with some competitors).</p>

9. Conclusions

The landscape for PPPs to play a role in market-oriented agricultural infrastructure is broad. Some of the models and illustrations given in this report are essentially donor grant-funded projects, with the private sector (for-profit or not-for-profit) carrying little commercial risk beyond working capital (e.g. the Morogoro VTTP in Tanzania). Others are almost entirely privately financed projects (e.g. KORD for road maintenance in Uganda), with virtually all commercial and political risks transferred to the private entity via a complex arrangement of equity, debt and guarantee instruments.

Unlike PPPs developed to provide an entirely “public” service, such as health care and basic education, PPPs explicitly designed to support agricultural development are likely to be only a partial “public good”, i.e. in part *exclusionary*. A case was made in Section 3.5 that, by focusing on agricultural development, an infrastructure project is invariably targeted at a discrete sub-subsection of the population. As noted, introducing private sector finance into this infrastructure provision may further delimit the scope of beneficiaries, with the service accessible only to those who can afford the user fee.

These two yardsticks give us a means to map the range of PPP models developed in this report. Figure 9.1 plots each PPP model against (i) the level of commercial risk borne by the private sector, and (ii) the extent to which the resulting infrastructure is targeted at a discrete population of agriculturalists, i.e. whether it is satisfying a narrow private interest or is in the broad public interest.

The form of contractual arrangement chosen to execute the PPP project is also central (see Figure 9.2). Concession arrangements offer incentives to the private sector to invest in agricultural infrastructure in the long term. However, the nature of agricultural production, with its inherent physical risks, need for infrastructure coordination and volatile commodity markets, suggests that concession agreements are but a partial answer to attracting the private sector and private finance. Other ways need be found to enable private parties to spread the main commercial risks, in particular, demand risk. The strategy of “bundling” infrastructure adopted in the KIIS Project in Uganda is one option. Another, as illustrated by the Gdansk Wholesale Market project, is to broaden the terms of concession agreements to allow the raising of indirect revenues from land development and on-leasing. As noted, in both cases care needs to be taken with the contractual arrangements so as not to contribute to criticism that private control or concessional development of public services and government land is exploitative of the state assets.

Finally, there is the question of public subsidies. We are currently seeing pledges of new aid for infrastructure from donors. Further, fiscal surpluses from oil, gas and mining revenues are accruing for a growing number of developing countries in Africa, the Near East and PRC, and may act as a new source of aid. For example, the International Monetary Fund (IMF)

estimates that total investments by sovereign funds have reached US\$2 000 billion and could reach US\$12 000 billion by 2012. There are also record levels of liquidity currently residing in multilateral and bilateral development finance institutions, resulting in shareholder pressure to invest more in frontier regions and sectors¹⁵⁸. Under these conditions, the opportunities to use public subsidies to attract private involvement into riskier and less profitable agricultural infrastructure have rarely been greater. Further, if those official institutions, such as the WB¹⁵⁹, anticipating a sustained bull market in agricultural commodities are proven right, then the long-term prospects for recovering financial investments in agricultural infrastructure are comparatively buoyant.

The task for FAO, and the AGS in particular, is to take these trends into account and consider how best to support public sector capacity in assessing and incentivizing the private sector to play a part in infrastructure that brings farm outputs to consumers.

Figure 9.1 Mapping PPPs in infrastructure for agricultural development: transfer of commercial risks

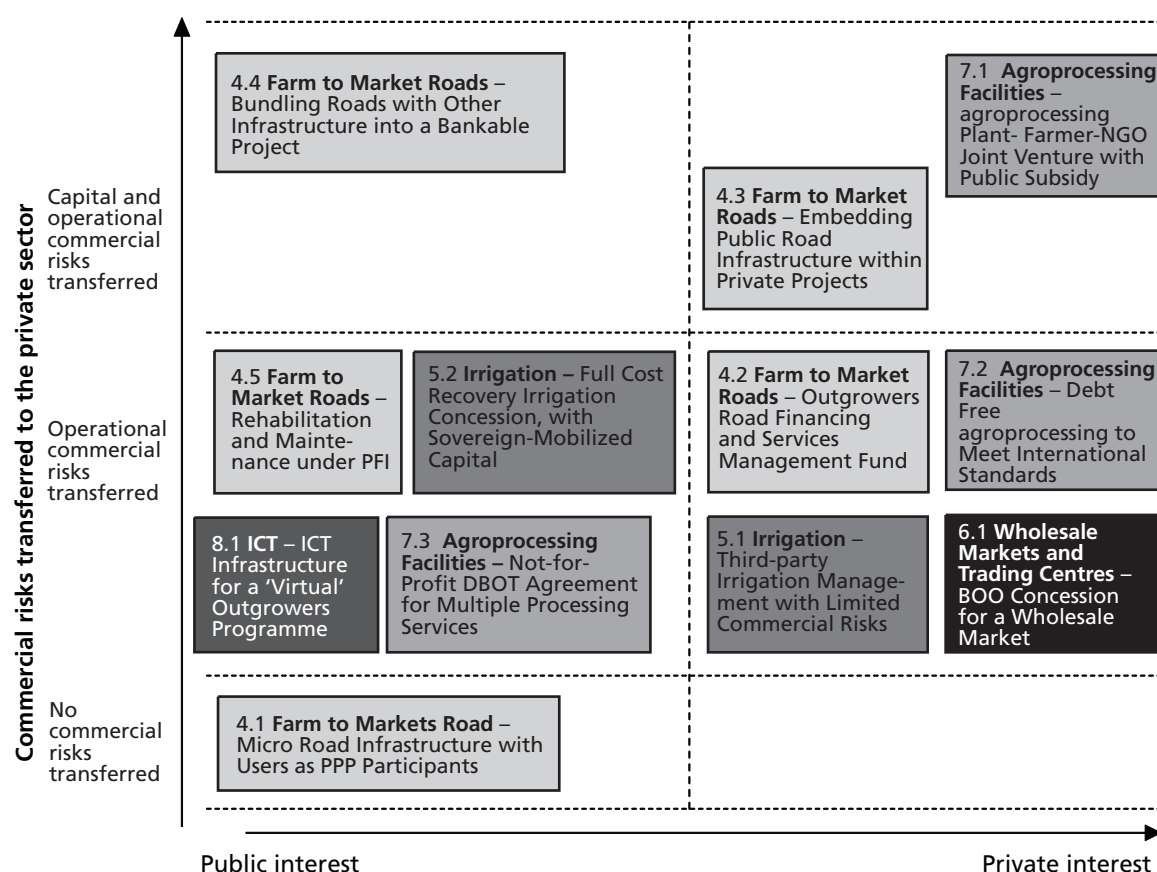
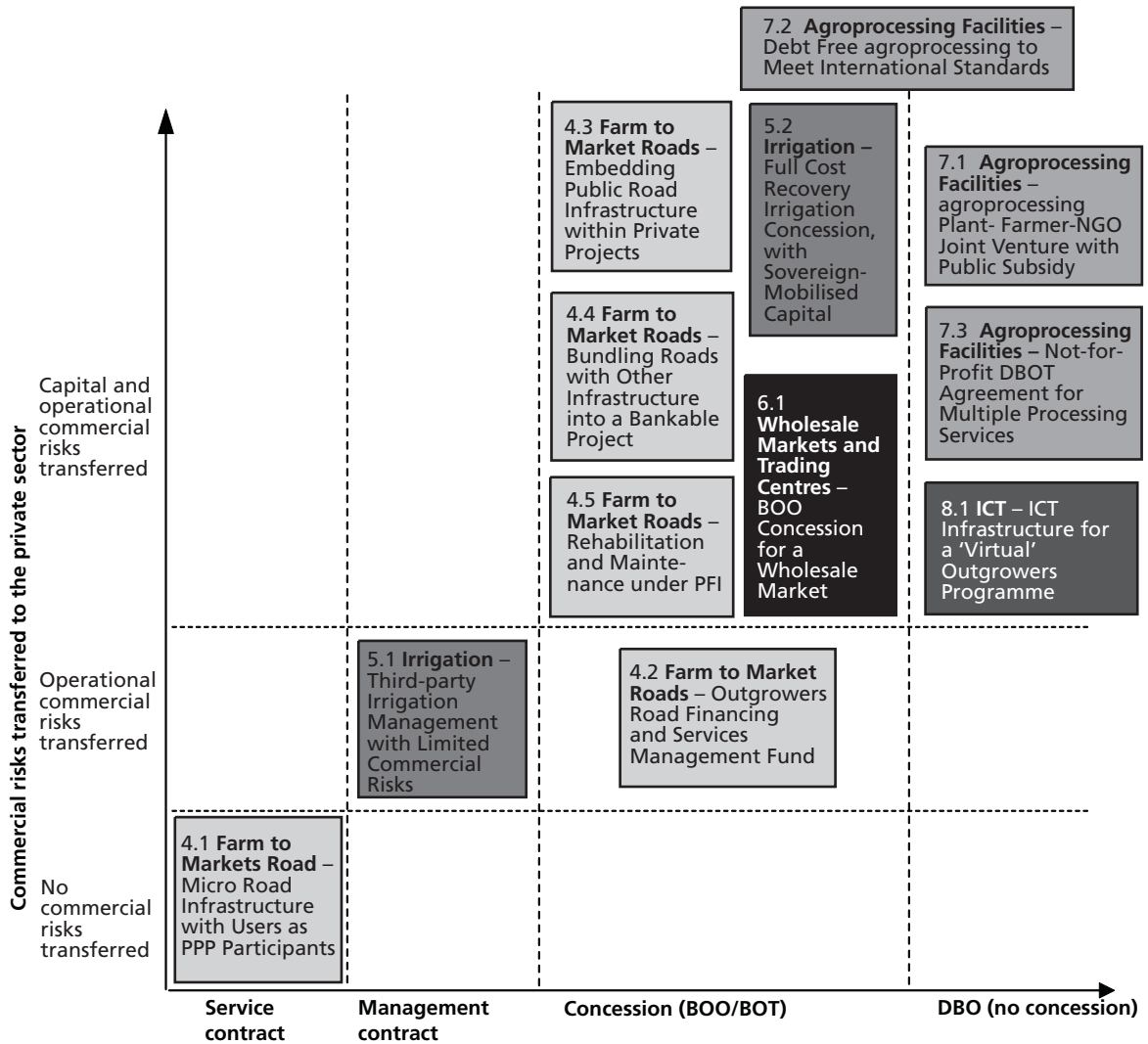


Figure 9.2 Mapping PPPs in infrastructure for agricultural development: type of contractual arrangement between public and private sector



ANNEX A

Public-Private Partnership Survey Questionnaire

Applicability of PPPs in Promoting Physical Infrastructure for Market Oriented Agricultural Production

Instructions for Interviewer:

1. This is a multiple choice questionnaire, and should be conducted fairly rapidly, e.g. 30 minutes
2. Read out each question clearly, and each of the multiple choice answers. Highlight the given answer with a 'Yellow' highlight (use 'bucket' icon on tool bar in top right of screen). Save with a distinct file name.
3. Where helpful, elaborate on the question using the 'Guidance for Interviewer' in preceding column, and the 'red flag pop-ups' in some of the individual cells (right click and red flags and click 'Edit Comment'. These 'prompts MUST be read through and understood BEFORE attempting to use the survey.
4. For each question marked with 'S', we are looking for only a 'SINGLE' answer, ask: "which of these answers is the closest fit?"
5. For each question marketed 'M', you may allow MULTIPLE answers, but ask the interviewee "which of the answers is the most dominant/important" and place an asterisk by this one*.
6. Questions marked 'PPP' are about the PPP arrangement as a whole.
7. Questions marked 'P' are about a single partner, most likely the organization that the interview is from.
8. Questions marked with 'nfrastructure' are about the whole infrastructure project from design, through construction to operations, i.e. the focus is on the infrastructure not necessarily only the specific PPP arrangement.
9. Overwrite 'other (please specify) with their suggested answer.
10. If none of the answers fit or the respondent does not know the answer, or if the respondent does not wish to include an 'other', then simply leave the line blank (i.e. do not highlight).

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
1	PPP	Description		Please provide a brief description of the infrastructure arrangement: (i) the main objectives; (ii) the current stage of development; (iii) the key partner organizations, (iv) the size and quality of the infrastructure.						
Overwrite description in here.										
2	PPP	S	<i>The interviewee should already know this based on the interviewee section criteria</i>	General Questions What type of infrastructure provision is the PPP about?	Rural roads	Rural markets	Pre- and post-harvest facilities (including storage)	Irrigation Works	Rural ICT	Rural Energy
3	PPP	S		Is this a 'new', 'rehabilitation' or 'expansion' project?	New infrastructure (i.e. no previous similar infrastructure exists in this location)	Rehabilitation or replacement of existing network	Expansion of existing network	other (please specify)		
4	PPP	S	<i>The interviewee should already know this based on the interviewee section criteria</i>	In which country is the infrastructure project or programme taking place?	Name of Country (overwrite)					
5	P	S	<i>Community-based' = programmes managed (and possibly owned) by community residents, for their community</i>	If you are speaking from the perspective of one of the partners, what is the general nature of your organization? (if not, leave blank)	for profit (not community-based)	not for profit (not community-based)	for profit (community-based)	not for profit (community-based)	Public entity	State-owned company
6	P	S	<i>We want to know here if the company is a new company dedicated to the specific infrastructure, or part (or a subsidiary of) a much larger company. Note, that we only want turnover 'within the country'</i>	Regarding the main private (or public) company involved in the PPP, estimate the annual turnover (total revenues) last year (US\$) of this company within the country?	<10 000	10 000-100 000	100 000-1 million	1 - 10 million	> 10 million	

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
7	Infrastructure	S		Estimate the total capital costs of the infrastructure arrangement contributed by all the partners collectively, if any (in US\$)?	<10 000	10 000-100 000	100 000-1 million	1 - 10 million	> 10 million	none (i.e. no capital costs involved)
8	Infrastructure	S		Estimate the total annual operational (recurrent) costs of the infrastructure arrangement	<1 000	1 000-10 000	10 000-100 000	100 000-500 000	>500 000	
9	PPP	S	<i>For example, this could be a two year Design and Build contract, or a three year renewable service contract, or a 20 year Concession contract etc.</i>	What is the anticipated duration of PPP arrangement?	< 1 year	1 - 2 years	2 - 5 years	5 - 15 years	> 15 years	
10	PPP	S	<i>See definitions of different legal status in 'red tags'</i>	1. The PPP Arrangement General What is the legal status of PPP arrangement (closest fit)?	service contract	management contract/ arrangement	joint venture agreement (no concession)	concession agreement (no agreement)	legal partnership	other (please specify)
11	PPP	M	<i>This question reflects the changing roles of the private sector in PPPs, e.g. from the private sector as only a source of finance, to a source of expertise, performance and/or capacity building. (Use 'other' category if the principal role of the private sector is not one of the options listed here).</i>	What are the principal functions/activities/roles provided by the private sector in the arrangement?	Source of capital investment	Management, performance and efficiency gains	Capacity and competency development	Risk management	Technical know-how	Infrastructure maintenance (please specify)
12	PPP	S	<i>This question reflects the very diverse range of roles of the public sector in PPPs, e.g. from a source of regulations, to a source of capital, to source of land etc. (Use 'other' category if the principal role of the private sector is not one of the options listed here).</i>	What is the principal functions/roles provided by the public sector in the arrangement?	Source of capital investment	Source of land and other assets	Strategic/policy direction	Regulatory framework	Risk management	Infrastructure maintenance (please specify)

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
13	PPP	S	See definitions of PPP design and construction arrangements in 'red tags'	Which type of PPP design, construction and operational arrangements most closely reflects that adopted in this PPP, if any (i.e. service or management contract may not have a design or construction component)? Procurement What was the dominant method for procuring/ selecting the private sector partner/s?	Design and Build	Construction Management ('as advisor' or 'at risk')	Design-Build-Operate	Build-Operate-Transfer	Design-Build-Operate-Transfer	other (please specify)
14	PPP	S	We need to find out whether certain types of PPP transaction/ negotiating processes are more appropriate than others	Finance and Resourcing For the PPP as a whole, who is involved in contributing which types of financial resources ? (Complete matrix - overwrite checks/ticks) Public bodies, including state-owned enterprises Domestic commercial financial institutions/banks International commercial financial institutions/banks Private sector companies Donors - concessional loans, export credit, concessional insurance; and grants Corporate Philanthropy Community-based organizations Not-for-profit organizations (not community-based)	Negotiated agreement (no bidding)	Competitive bid (first past the post)	Competitive bid (with preferred bidder status)	Targeted procurement , e.g. Black Economic Empowerment in South Africa	other (please specify)	
15	PPP	M	This is about what types of financial or in-kind resources were contributed by which organizations, i.e. private sector may be contributing \$ and the public only the land as a concession; or the private sector may be contributing no \$ and simply be providing a service.		equity finance or venture capital	loans/debt	insurance/ guarantees/ export credit	grant capital (with no expectation of infrastructure-related return)	working capital (operational /recurrent costs)	customer subsidies (operational /recurrent costs)

please mark all that apply to each partner with a ü

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
16 PPP		S	See definitions of financial transfers in 'red tags'	Where relevant, what is the principal form of financial transfer from the public to private sector body? Which types of 'in-kind' resources were contributed to the PPP by any party?	lumpsum	unit price	guaranteed maximum price	cost plus	other (please specify)	
17 PPP		M			Land (and other natural resources)	Building/building space	Labour/skills	Materials/equipment/products	Specialist information - local knowledge, legal advice etc.	other (please specify) if several answers, please indicate the dominant one with an *
18 PPP		S		Risks to the Effectiveness of the PPP Arrangement If relevant, which of these risks associated with the construction phase do/did you consider to be the greatest, if any?	Regulatory delays	Financial delays	Materials and men Mobilization delays	Cost overruns	other	
19 PPP		S		If relevant, which of these risks associated with the operation phase do/did you consider to be the greatest?	Poor technology and equipment performance	Input unavailability	Management quality deficiencies	Cash flow problems	Debt service problems	other (please specify)
20 PPP		S		If relevant, which of these market factor risks relating to the operation of the infrastructure do/did you consider to be the greatest, if any?	Insufficient demand	Over demand	Late payments by users	Non-payment by users		
21 PPP		S		If relevant, which of these economic risks relating to the operation of the infrastructure do/did you consider to be the greatest, if any?	unavailability of affordable short-term financing (working capital)	unavailability of affordable long-term financing (equity, debt, insurance)	interest rate change	foreign exchange rate change	inflation	other (please specify)

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
22 PPP		S		Which of these political risks relating to the operation of the infrastructure do/did you consider to be the greatest, if any?	Regulatory risks, including taxation, imposed changes in tariffs, changes to rules for foreigners, restrictions on operations	expropriation	non-neutrality of legal system, including dispute resolution	political 'cross-fire' risks, e.g. anti privatization of water	local public hostility, e.g. tariff rates, social or environmental impacts	other (please specify)
23 PPP		S		In relation to this infrastructure project, which of these risks do/did you consider to be of greatest concern for the reputation of your organization, if any? Management and Operations	corruption, bribery or extortion by public officials	corruption, bribery or extortion by private sector parties	adverse environmental impacts and risks	adverse social/community impacts and risks	human rights violations	other (please specify)
24 PPP		S		Which partner leads on day-to-day operation/management decisions?	Joint management team	For profit private	not-for-profit private	public authority	state owned company	other (please specify)
25 P		S		What is the dominant type of performance incentive mechanism within this PPP for the main public sector parties, if any?	Reward for cost savings	Reward for speed of delivery	Reward for quality of service	Reward for expansion of service	other (please specify)	
26 P		S		What is the dominant type of performance incentive mechanism within this PPP for the main private sector parties, if any?	Reward for cost savings	Time penalties	Reward for quality of service	Reward for expansion of service	other (please specify)	

Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
27 Infrastructure	M		What is the dominant type of operational cost recovery/revenue stream for the PPP?	private customer unit based user fee (e.g. toll, tariff)	private customer periodic payments (annual or quarterly), e.g. rent, license fee	public sector customer user fee, e.g. secure revenue payment, e.g. lease payments as part of Private Finance Initiatives (schools, hospitals)	public sector subsidy	other (please specify)	if several answers, please indicate the dominant one with an *
28 Infrastructure	S		What is the principal source of operational revenue/cost recovery for the PPP?	low-income households	middle-income households	high-income households	traders/intermediaries/assemblers	processors (value adding businesses) >20%	government authorities (please specify)
29 P	S		If the private sector party is contributing its own financial resources, what is the estimated Return on Investment (RoI) over the project life?	< 0%	0% to 5%	5%-10%	10%-20%	>20%	not applicable
30 PPP	ODI	Response to this question is answered by ODI/FAO, not interviewee.	2. Enabling Environment (governance) Country 'good governance' index - Kaufmann (overwrite using World Bank indicators)	<i>Interviewer: type country in here (overwrite)</i> very poor	poor	moderate	good	very good	
31 PPP	S		What level of popular support is/was there for private sector involvement in this PPP from the general public, especially local communities ?	very poor	poor	moderate	good	very good	
32 PPP	S		What level of political will is/was there for private sector involvement in this PPP arrangement?	very poor	poor	moderate	good	very good	

Question	Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
3. Outputs and Outcomes										
				Outputs		Output-based (physical, i.e. market penetration), e.g. number of telephone lines	Output-based (performance), e.g. quality of water, speed of phone connection; annual electricity savings	research and development, e.g. experimentation or demonstrator project	Reputation	other (please specify)
33	P	S		What was/is the most important business-driver for the private sector to have participated in this PPP arrangement?	revenues and profit	market penetration	market development	research and development, e.g. experimentation or demonstrator project	Reputation	other (please specify)
34	Infrastructure	M		Who are/were the principal beneficiaries of the infrastructure?	primary producers	trader/ assembler/ transporter/ distributor	agro-processor	wholesaler	consumer (the general public)	if several answers, please indicate the dominant one with an *
35	Infrastructure	S		Estimate the number of individuals employed directly in the construction of the infrastructure (whether this be manual, semi-skilled or skilled job)?	<10	10 to 50	50 to 200	200 to 500	>500	
36	Infrastructure	S		Estimate the number of individuals employed directly in the operations and maintenance of the infrastructure (whether this be manual, semi-skilled or skilled job)?	<10	10 to 50	50 to 200	200 to 500	>500	
37	Infrastructure	S		Outcomes Where is the dominant location of the infrastructure users ?	urban (city/large town)	urban (small town)	rural town	rural remote village/dispersed	other (please specify)	

Focus of Question	Single (S) or Multiple (M) Answers	Guidance for Interviewer	Survey Questions	A	B	C	D	E	F
38 Infrastructure	S	<i>This is 'not' about employment during construction or in the operation of the infrastructure, but about employment and income earning opportunities arising from the positive impact of the infrastructure on agricultural development</i>	In the medium-to long term, where do you anticipate the dominant agriculture-related employment benefits arising from this infrastructure to be located?	urban-centered employment	on-farm employment	rural off-farm employment (e.g. waged labor, agro processing)	seasonal migrant employment	other (please specify)	no change
39 PPP	S		Which factor is most critical to enabling this type of PPP arrangement to be dramatically scaled up or replicated ?	reforms to the legal and regulatory framework	access to risk finance for <i>capital expenditure</i> (equity, debt etc.)	access to affordable working capital for cash flow during operations/ <i>recurrent expenditure</i>	<i>political will</i> or popular support	<i>local human resource development</i> (technical skills)	other (please specify)
40 Infrastructure	S	<i>This question is about the appropriateness of the PPP from a general 'development' perspective, i.e. the PPP may serve one or other organization well, but may still not deliver the development goal of 'market-orientated agricultural production'</i>	How do you rate the overall likely/actual contribution of this infrastructure to promoting agricultural production and development ?	very high	high	moderate	low	very low	
41 Infrastructure	Description	<i>This is a general, 'subjective' question, designed to find out how the physical infrastructure will deliver the outcome of market-orientated agricultural production?</i>	In brief, could you describe in what ways do you consider that the infrastructure will promote the overall objective of agricultural production and development ?	Write response in here (overwrite)					

Criteria for selection of PPP Survey Interviewees

20 models each from the following five infrastructure categories:	Rural roads	Rural makets	Pre- and post harvest facilities (including storage)	Irrigation Works	Rural ICT
Supplementary criteria, ie within this 100, aim to achieve as far as is practicable a spread of models, as follows:					
drawn from the five regions	Latin America	Asia	Africa	Eastern Europe	Central Asia
varying sizes (based on total financial resources contributed to the PPP by all partners?) - at a minimum some <\$10 000 and some >\$1million	<\$10 000	\$10 000-100 000	\$100,000-1 million	\$1 - 10 million	> \$10 million
different governance, but at a minimum some service contracts (public control) vs some concessions (private control)	service contract	management contract/ arrangement	joint venture agreement	concession agreement	other

ANNEX B

Detailed case study: selection criteria

PPP economic-governance scenarios	Scenario characteristics	Markets for agricultural production
<p>Disadvantaged economic-governance Scenario #1</p>	<p>Economic characteristics:</p> <ul style="list-style-type: none"> • overvalued local currency (prohibitive to hard currency PPP financing); • local financial markets very underdeveloped (no long-term debt, venture capital, private equity and risk finance instruments overpriced or absent); • existing agricultural infrastructure non-existence or very poor; • very low household incomes; • low population density; • domestic private engineering and construction sector (infrastructure firms) very underdeveloped. <p>Governance characteristics:</p> <ul style="list-style-type: none"> • PPP regulations absent or prohibitive (e.g. no PSP in public services); • public sector capacity gaps in network planning, VFM calculation (PSC), competitive tendering, contract negotiations and PPP monitoring (central and municipal); • volatility and unpredictability in public expenditure budgeting (central and municipal); • other public sector capacity gaps in fulfilling its role in PPP, e.g. regulator, quality control, marketing/competitiveness; • very low level of political will or public support for PSP; • PPP risks and uninsurable risks very high, e.g. corruption, expropriation, foreign exchange risk, nationalization. 	<p>Export commodity and high-value markets, e.g. tea, sugar, vanilla, wool, cotton, cocoa, tobacco, coffee, cut flowers, speciality vegetables, cashew, pineapples, fish</p> <p>Competitive advantage of infrastructure in value chain:</p> <ul style="list-style-type: none"> • volume thresholds • quality thresholds • traceability • reliability of supply • Output price (farmgate) <p>Format for 18 case studies:</p> <ul style="list-style-type: none"> • Answers to general survey questions; • Questions on specific research areas, linked to policy needs of MoA. <p>1st Tier selection criteria:</p> <ul style="list-style-type: none"> • 18 cases spread across the 3 market types and 2 economic-governance scenarios (3 cases per cell); • 2-3 cases each on the four infrastructure types: <ul style="list-style-type: none"> - water for irrigation; - pre-and post-harvest storage (e.g. cold storage chain); - covered markets and other facilities for transactions; - agroprocessing (where this is a "public good"); • balance of large-scale and small-scale infrastructure; • spread of PPP types: <ul style="list-style-type: none"> - private sector brings Capital Expenses(CapEx) + Operational Expenses (OpEx); - private sector brings OpEx only; - management or service contracts (outsourcing, corporatization of public entities). <p>2nd Tier selection criteria:</p> <ul style="list-style-type: none"> • include some public good infrastructure "embedded" in private operations; • include a few integrated ("bundled") infrastructure programmes, e.g. Kalangala; • a few farm-to-market roads and other transportation, telecoms, rural electricity (NB feed roads and ICT likely to be key to local rural markets category). <p>(Sources of case studies: FAO AGS and AGST; FAO/ODI survey; Interim Report; NEPAD/technoServe; further interviews with key informants.)</p>
<p>Emerging economic-governance Scenario #2</p>	<p>Economic characteristics:</p> <ul style="list-style-type: none"> • local currency accurately priced vis-à-vis hard currency; • local financial markets moderately developed (high-priced long-term debt, limited private equity, some risk finance instruments, e.g. insurances); • existing agricultural infrastructure present, but in need or rehabilitation and extension; • variable household incomes; • variable population density; • domestic private engineering and construction sector (infrastructure firms) present. <p>Governance characteristics:</p> <ul style="list-style-type: none"> • PPP regulations in place (e.g. PSP in public services); • public sector capacity has some expertise in network planning, procurement, contract negotiations and monitoring (central government more so than municipal); • reasonable track record in predictable public expenditure budgeting (central government more so than municipal); • bottlenecks in public sector capacity gaps to fulfil role in PPP, e.g. regulator effectiveness, quality control, marketing/competitiveness; • moderate levels of political will and public support for PSP; • uninsurable risks mainly limited to foreign exchange risk and political risk. 	<p>Domestic urban markets – supermarkets and fast-food, e.g. sugar, processed meat, fish, milk products, cereals, vegetables, salads, fruits</p> <p>Competitive advantage of infrastructure in value chain:</p> <ul style="list-style-type: none"> • volume thresholds • input costs • reliability of supply • output price (farmgate) <p>Competitive advantage of infrastructure in value chain:</p> <ul style="list-style-type: none"> • input costs • productivity • seasonality of supply and efficient price transmission • output price (farmgate)

ANNEX C

Overview of commissioned case studies

Source	Country	Infrastructure	Financial Risk	Country status	Market types	Private sector financing	Scale	Variations	Principal Purpose of Commissioning Case-study				
			OECD country credit risk rating		Export market (E); Urban market (U); Local market (L)	CapEx + OpEx (CO); OpEx only (O); service or management contract only (SM)	Large (L); Small (S)	Integrated (I); embedded (E)	Institutional and support mechanisms	Local private sector involvement	Design - structural	Design - financing	Attract the private sector
Irrigation Works													
1	Survey	Nepal	7	low income	E	CO	S	I	yes	yes		yes	
2	Interim report	Mauritania	7	low income	L	SM	S			yes	yes		
3	Survey	Egypt	4	low-middle income	E	CO	L		yes		yes	yes	yes
Pre and post harvest facilities													
4	Survey	Fiji	no rating	low-middle income	E	SM	S						yes
5	FAO	Viet Nam	5	low income	U	O	S		yes				yes
6	Survey	Kenya	6	low income	U	CO	S						yes
7	Survey	Lebanon	7	upper-middle income	U	SM	L	I					yes

Covered markets and collection points										
8	Survey	Poland	Wholesale market	2	L	CO	L	yes	yes	
9	FAO	Vietnam	Farmers shops	5	low income	CO	S	yes	yes	yes
10	FAO	Ukraine	Wholesale market	5	upper-middle income	CO	L	yes	yes	yes
11	FAO	Ukraine	Wholesale market	5	upper-middle income	CO	L	yes	yes	yes
Farm to market roads										
12	Survey	Uganda	Integrated (island) infrastructure development fund	7	low income	CO	L	I	yes	yes
13	Survey	Uganda	Infrastructure development fund	7	low income	CO	S	E	yes	yes
14	Survey	Tanzania	Rural feeder roads	6	low income	SM	S		yes	yes
Information and communications technology										
15	Survey	India	Telecentres	3	low income	CO	S		yes	
16	Survey	Kenya	Rural supply chain managt	6	low income	CO	L		yes	
Rural electrification										
17	Survey	Peru	rural area power supply	4	lower-middle income	CO	S		yes	yes
18	FAO	Cambodia	rural electrification from rice husks	no rating	low income	CO	L	I	yes	yes

ANNEX D

Donor technical assistance facilities for infrastructure projects

Name of TA Programme	Sponsor	Reach	Main activities
Public-Private Infrastructure Advisory Facility (PPIAF)	Asian Development Bank (ADB), Canada, European Commission, France, Germany, Japan, Netherlands, Sweden, Switzerland, United Kingdom, United States, WB Group.	Funds a range of activities across all developing countries. At the end of 2006, the PPIAF portfolio covered 537 activities in more than 110 countries (two-thirds of activities directed to low-income countries and 50 percent to Africa).	<p>PPIAF is a multidonor technical assistance facility aimed at helping developing countries improve the quality of their infrastructure through PSP.</p> <p>Provides small technical assistance grants to developing country governments to help them improve develop the “enabling environment” for infrastructure services through PPPs, e.g. design infrastructure strategies, advice on which policies and regulations will work best, organize training programmes, host stakeholder workshops and create outreach and communication programmes to engage with stakeholders. About half the grants are under US\$75 000. The average size of a PPIAF grant is US\$215 000.</p> <p>PPIAF grants are provided to governments (not the private sector) at their specific request to hire consultants and are not associated with any conditionality that the government enters into a PPP arrangement.</p>

Name of TA Programme	Sponsor	Reach	Main activities
The Private Sector Development Group (The PIDG family)	The PIDG family is funded by United Kingdom DFID, the Swiss State Secretariat for Economic Affairs (SECO), the Netherlands Ministry of Foreign Affairs (DGIS), the Swedish International Development Cooperation Agency (Sida), the WB and the Austrian Development Agency (ADA).	<p>PIDG's agencies have established the PIDG Trust for the purpose of funding the various PIDG facilities and affiliated programmes.</p> <p>PIDG facilities (investment vehicles):</p> <ul style="list-style-type: none"> - The Emerging Africa Infrastructure Fund (EAIF) - Infrastructure Development Company (InfraCo) - Local Currency Guarantee Facility (GuarantCo) - Technical Assistance Facility (TAF) - Asia Private Infrastructure Financing Facility (AsPIFF) <p>Affiliated programmes:</p> <ul style="list-style-type: none"> - GPOBA - Project Development Facility (DevCo) 	<p>PIDG is a multi-donor, member-managed organization with an objective to provide financial, practical, strategic support to encourage private infrastructure investment in developing countries that contributes to growth and poverty reduction. A sub-group of the PPIAF donors formed PIDG in order to help address constraints to private investment in infrastructure other than the lack of an appropriate enabling environment (e.g. the high upfront cost of project development; a shortage of long-term debt, both in hard and local currencies; the need to strengthen public capacity to negotiate and implement private infrastructure projects; the need for subsidies if many projects targeted on the poor are to be financially viable; and finally currency risks).</p>
The PIDG family:			
The Emerging Africa Infrastructure Fund (EAIF)	<p>DFID, Sida, the Netherlands, SECO.</p> <p>Standard Bank Group, Barclays Bank plc, FMO NV (together the SBL group).</p> <p>Development Bank of Southern Africa.</p> <p>German Development Finance Institution (DEG)</p>	<p>The EAIF is a public-private joint venture that leverages debt-finance from private sector and development finance institutions through spreading risk and providing limited guarantees.</p> <p>Its main vehicle is an equity company financed by grant donors. Operates in all sub-Saharan African countries other than South Africa and Mauritius.</p>	<p>EAIF provides long-term debt to pro-poor private sector funded infrastructure projects in sub-Saharan Africa. It provides risk mitigation to the banks lending to it through its financial structure in which grant funds are subordinated to those of other funders.</p> <p>EIAF lends to greenfield ventures, privatized infrastructure companies, and for refurbishment/upgrades/expansion of capacity. It lends to the full range of infrastructure sectors including power, telecoms, transportation and water.</p>

Name of TA Programme	Sponsor	Reach	Main activities
Infrastructure Development Company (InfraCo)	Austria, the Netherlands, Sweden, Switzerland, the United Kingdom and the WB.	Active in low-income developing countries primarily in Africa and parts of South and Southeast Asia.	InfraCo is a private sector infrastructure development company. Acts as an honest broker to structure viable infrastructure investment opportunities and offers them, prior to financial close, to private sector developers.
Local Currency Guarantee Facility (GuarantCo)	DFID, Sida, SECO.	GuarantCo is a limited company owned indirectly by the PIDG members through the PIDG Trust that offers services to private sector infrastructure companies and municipalities, in all lower and lower middle income countries.	<p>GuarantCo's mission is to support the development of local currency infrastructure financing through guarantees offered as credit enhancements to facilitate the issuance of local debt instruments. By providing local currency solutions to financing, a project's chances of default are reduced as the currency matching problems are reduced (domestic revenues, foreign exchange funding).</p> <p>GuarantCo aims to develop the capacity of local capital and credit markets so that more local financing can be provided for infrastructure projects.</p>
Technical Assistance Facility (TAF)	PIDG, with funding support from the WB, established the TAF to assist in the building of local capacity and capability associated with private sector investment in infrastructure.	Assistance is provided to both the public and private sectors in support of projects and programmes of any of the facilities or funds operating under the PIDG umbrella on a "challenge fund" basis.	Through the issuance of technical assistance grants, the TAF provides a mechanism for delivering short-term and medium-term projects of technical assistance and capacity building. The overall objective is to enhance the ability of public and private sector clients to attract private capital to the financing of infrastructure and related services through assisting PIDG clients to evaluate, develop and/or implement risk mitigation, financial and regulatory mechanisms, standards, systems and procedures essential to raising funds in the capital markets.

Name of TA Programme	Sponsor	Reach	Main activities
The Asia Private Infrastructure Financing Facility (AsPIFF)	DFID, Asian Development Bank (ADB), other DFIs and private lenders are planned.	AsPIFF will use its capital to support and facilitate the development and implementation of privately owned infrastructure projects in Asia directly benefiting the poor.	AsPIFF is a new investment facility with a focus on smaller-scale, greenfield, infrastructure projects in the emerging Asian markets. AsPIFF will act as a channel for clients to use the products of other PIDG entities, offering hard and local currency loan products packaged with scaled-down versions of products from other institutions. It will also draw upon TAF to help develop local capacity in both public and private sectors.
Project Development Facility (DevCo)	IFC, DFID, Dutch Ministry of Foreign Affairs.	DevCo supports transactions in the poorest nations (Development Co-operation Directorate (DCD- DAC) List Columns I-III).	DevCo is an untied multidonor facility that funds technical assistance to developing country governments to help them attract private investment into their infrastructure sectors. This is an innovative initiative aimed at improving how projects are developed, structured and tendered to the private sector, thus reducing commercial risk. The basic assumption behind the initiative is that project developed with private sector funding in mind, rather than public, will be more bankable.
GPOBA	The WB, DFID, IFC, the Netherlands, AusAid.	GPOBA funds and Output-Based Aid (OBA) activities in most regions and in all the infrastructure sectors. OBA is a strategy for using explicit performance-based subsidies to support the delivery of basic services where policy concerns would justify public funding to complement or replace user-fees.	GPOBA provides funding of output-based payments under OBA schemes to facilitate the piloting of innovative, small-scale projects. It also assists in the design, implementation and evaluation of particular schemes intended to pilot the application of OBA approaches to the delivery of eligible services (water, sanitation, electricity, telecommunications, transportation, health and education) to those least able to afford them and to those currently without access.

Name of TA Programme	Sponsor	Reach	Main activities
IFC Technical and Advisory Services	IFC, various donors and trust funds.	Active worldwide, in over 67 countries.	<p>Provides advisory assistance, primarily to governments, on PSP in infrastructure and other public services, as well as the restructuring of state-owned enterprises. The services help to establish PPPs through which governments can obtain increased services under budget constraints while benefiting from private sector expertise, management and finance.</p> <p>Its efforts focus primarily on expanding access to public services such as power, water and sanitation, transport, and, more recently, health services.</p>
IFC Private Enterprise Partnership for Africa (IFC PEP Africa)	IFC, various donors and trust funds.	PEP Africa establishes partnerships with donors, governments, and the private sector.	PEP Africa's main profile is to design and deliver technical assistance programmes and advisory services that improve the investment climate, mobilize private sector investment, and enhance the competitiveness of small- and medium-sized businesses. One of PEP Africa's key business areas is supporting private sector provision of infrastructure.

Name of TA Programme	Sponsor	Reach	Main activities
IFC Foreign Investment Advisory Service (FIAS)	Australia, Canada, Finland, France, Ireland, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom, WB Group, USAID, UNDP.	Active both in middle-income and low-income countries.	<p>FIAS offers a comprehensive range of services tailored to governments' needs to help them improve their investment climate for domestic and foreign investors and maximize impact on poverty reduction. FIAS core advisory services help client governments to promote economy-wide regulatory reforms, assess the competitiveness of promising industry sectors, and design institutions and reform processes to sustain implementation.</p> <p>FIAS's core advisory services include: investment climate diagnostics, investment laws and promotion, administrative barriers solutions, industry competitiveness.</p>

Name of TA Programme	Sponsor	Reach	Main activities
Multilateral Investment Guarantee Agency (MIGA), Technical Assistance Programme	WB, IFC, various donors.	MIGA provides a broad range of technical assistance to clients, including investment promotion agencies, business associations, promotional departments within sectoral ministries and other government and private sector organizations.	MIGA provides technical assistance to investment promotion intermediaries in developing member countries to enhance their capacity to provide investors with information and advice, with the goal of reducing the transaction costs associated with site selection, as well as helping new ventures get established.
			MIGA provides assistance to build capacity in strategic planning, investor marketing, sector targeting, and in improving responsiveness to investor needs through information services.
			Special emphasis is placed on MIGA's strategy to support infrastructure development, highlight the attractiveness of investing in frontier markets, stimulate investment into conflict-affected countries, and encourage investment between developing countries.
European Bank for Reconstruction and Development (EBRD) Technical Cooperation Funds Programme (TCFP)	The programme receives grants from about 30 government ministries and agencies.	The regional allocation of donor funds deployed by the EBRD is shifting away from the countries of Central Europe towards the less advanced countries of the Western Balkans and to the early transition countries of Armenia, Azerbaijan, Georgia, Kyrgyzstan, Moldova, Tajikistan and Uzbekistan.	The TCFP provides funding to improve the preparation and implementation of the EBRD's investment projects as well as advisory services to private and public sector clients.
			TCFP provides technical assistance for the reconstruction or development of infrastructure, including environmental programmes, necessary for private sector development and the transition to a market-oriented economy.

Name of TA Programme	Sponsor	Reach	Main activities
Facility for Euro-Mediterranean Investment and Partnership, Technical Assistance Support Fund (FEMIP TASF)	The Fund is managed by the European Investment Bank (EIB) and receives financial support from the European Commission.	The fund's purpose is to promote financial and economic cooperation between the Union and the Mediterranean Partner Countries.	The Fund's aim is to help partner countries and private promoters to better prepare, manage and supervise their investment projects. Approximately 70 percent of these funds were allocated to the infrastructure, water and wastewater sectors.
The EU-Africa Infrastructure Trust Fund	European Investment Bank, EU Member States, EU Commission.	An EU Trust Fund to facilitate the blending of grant resources from the Commission and Member States with the lending and technical capacity of the EIB and Member State development financiers. Benefits cross-border and regional infrastructure projects in sub-Saharan Africa.	The Fund targets infrastructure sectors such as energy, water, transport and telecommunications, providing grant-support for: <ul style="list-style-type: none"> • interest rate subsidies • project technical assistance/feasibility studies • one-off grants for environmental or social components linked to projects • payment of early-stage, risk-mitigation insurance premiums
Cotonou Agreement Investment Facility	European Investment Bank, EU Member States.	African, Caribbean and Pacific (ACP) countries.	<p>The Investment Facility (IF) provides various forms of risk sharing financing instruments for investment projects in most sectors of the economy. This includes projects in the commercially run public sector and in the infrastructure sector.</p> <p>IF support is provided through:</p> <ul style="list-style-type: none"> • debt finance • guarantees • equity-type financing • acting as an investor in private equity funds <p>The IF is a revolving fund, i.e. loan amortizations will be re-invested in new operations.</p>

Name of TA Programme	Sponsor	Reach	Main activities
Infrastructure Project Preparation Fund (InfraFund)	Administered by the Inter-American Development Bank (IDB), open to various donors, including governments and state and multilateral agencies as well as private concerns interested in investing in the infrastructure sector in Latin America and the Caribbean (LAC).	The InfraFund is dedicated to assisting public, private and mixed-capital entities in LAC in the identification, development and preparation of bankable and sustainable infrastructure projects that have the potential of reaching financial closure.	<p>Activities include the preparation of pre-feasibility and feasibility studies, project design, document preparation and revision to carry out financing requests and/or for bidding purposes, studies related to project viability.</p> <p>Furthermore, the Fund's profile includes preparatory activities for investment transactions in infrastructure, such as public sector capacity building and targeted business climate enhancement measures and other initiatives aimed at boosting PSP in infrastructure in LAC.</p>
The NEPAD Infrastructure Project Preparation Facility (NEPAD-IPPF)	Originally funded by Canadian Government, now multi-donor facility, managed by the African Development Bank (AfDB).	The mandate of the NEPAD-IPPF is to assist African countries, Regional Economic Communities (RECs) and related institutions to prepare high quality and viable regional infrastructure projects and programmes through cooperation among African countries, donors and the private sector.	Objectives of the NEPAD-IPPF are to support the creation of an enabling environment for PSP in infrastructure, and support to targeted capacity building initiatives in infrastructure development in order to enhance the sustainability of existing and planned regional infrastructure developed in the continent.
NEPAD Infrastructure Investment Facility (NIIF)	African Business Roundtable (ABR) and NEPAD, with funding from the WB Group. A budget of US\$50 million is required over a five-year period. NIIF is currently seeking to mobilize 10 percent of this funding from African enterprises and institutions.	Research shows that African firms have played only a limited role in infrastructure development to date. Constraints include: underdeveloped domestic financial markets, difficulties in mobilizing equity, lack of information on project opportunities, limited access to tax and other incentives available to foreign investors, and a weak domestic consultancy sector.	A private sector led facility providing capacity building and other services to African businesses and public authorities to develop and bring infrastructure projects to financial close. The objective of NIIF is to help local developers to overcome these obstacles and to become owners and/or operators of infrastructure facilities in the region.

Name of TA Programme	Sponsor	Reach	Main activities
Investment Climate Facility for Africa (ICF)	<p>Donors: DFID, European Commission, IFC.</p> <p>Corporate investors: Unilever, Microsoft, Royal Dutch Shell plc, SABMiller, etc.</p>	<p>ICF is a partnership between African governments, the private sector and donor agencies.</p>	<p>ICF is a new private-public sector funded independent trust, the only pan-African body based in Africa that is explicitly focused on improving the continent's investment climate and run in accordance with private sector principles.</p> <p>ICF facilitates business development and expansion – focusing on ICT and infrastructure development, business registration and licensing and property rights. It leverages private sector and donor money to help fund investment climate reforms.</p> <p>In particular circumstances, where the ICF receives strong and relevant project proposals, ICF acts as a grant-making body and works through third parties.</p>

Name of TA Programme	Sponsor	Reach	Main activities
Growing Sustainable Business (GSB) Initiative	<p>GSB engages stakeholders in government, private sector, NGOs, donors, and the UN.</p> <p>Private sector participants include:</p> <ul style="list-style-type: none"> • Ericsson – Rural telecommunications • Unilever • Total • E7 fund – Rural electrification • Société Générale • Kevian – Fruit processing • BushProof – Clean water 	<p>The GSB was initiated in 2002 by the Global Compact and administered by the UNDP.</p> <p>GSB operates in low-income countries worldwide.</p>	<p>The GSB initiative facilitates business-led enterprise solutions to poverty in advancement of the Millenium Development Goals (MDGs). It engages the private sector in innovative partnerships grounded in market-based incentives where financial sustainability is embedded in design.</p> <p>Activities – including brokerage, up-front feasibility and technical studies – are designed to improve the supply of bankable, pro-poor investment projects.</p> <p>The GSB delivery mechanism has the ability to facilitate a large number of investments ranging from rural telecommunications to agriculture supply chains to provision of finance for small and medium enterprises as well as agribusiness and ecotourism.</p>

Name of TA Programme	Sponsor	Reach	Main activities
Infrastructure Consortium for Africa	A tripartite relationship between bilateral donors, multilateral agencies and African institutions. The membership of the Consortium from the African side is led by the African Development Bank (AfDB) while EU Commission, NEPAD Secretariat and Regional Economic Communities participate as observers in meetings of the Consortium.		<p data-bbox="1034 342 1356 779">Acts not as a financing agency, but broker of more donor financing of infrastructure projects and programmes in Africa (AfDB). Plays an advocacy role, to ensure a more urgent, larger and more effective response to Africa's infrastructure needs, including urging greater attention in country poverty reduction strategies and other national development strategies.</p> <p data-bbox="1034 813 1356 925">Offers to rationalize the "plethora" of project preparation facilities and expansion if necessary.</p> <p data-bbox="1034 958 1356 1247">Responds to the need for "scale" by mobilizing additional funds for infrastructure and more effective use of existing sources of finance for feasible projects; and identifying funds in the near term for a number of priority projects.</p>

Endnotes and references

1. For example, a recent confidential discussion paper by AGS on the role of FAO in rural infrastructure. 2005.
2. It is noted that these investments can be productive in the medium to long term.
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Market-oriented agricultural infrastructure: appraisal of public-private partnerships

This Occasional Paper presents the findings of a study that appraises and compares different models of public-private partnership (PPP) in rural infrastructure development. The study was commissioned by the Rural Infrastructure and Agro-Industries (AGS) Division of FAO, under its normative programme on Rural Infrastructure Development. It contributes to the identification of public-private models for different categories of market-oriented infrastructure for agricultural development. It specifically looks at five types of infrastructure categories: (i) farm to market roads; (ii) water for irrigation; (iii) wholesale markets and trading centres; (iv) agroprocessing facilities; and (v) information and communications technology.

The paper is based on a review of 35 public-private partnership projects as they relate to the provision of "hard" and "soft" infrastructure for market-oriented agricultural development. The study describes the rising demand for new investment in rural infrastructure and identifies some of the failures to date in engaging the private sector successfully in its provision. It also highlights the key financial and institutional "building blocks" of public-private partnerships. In particular in sections 4 to 8, a range of models for public private partnerships is presented and analysed for their success factors, innovations and weaknesses, drawn mainly from the case studies commissioned for this study. The final section brings together areas for further research and follow up that can be of strategic interest to organizations involved in market-oriented infrastructure

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