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Financing small-scale infrastructure investments in developing countries

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Abstract

In most developing countries a shortage of long-term, local-currency financing for small-scale infrastructure projects impedes local economic development. Inadequate fiscal transfers, little own source revenue and low creditworthiness make it difficult for local governments to fully fund projects on their own. This paper proposes the use of project finance as a means to attract financing from domestic banks and institutional investors. Donors can play a catalytic role by providing technical assistance to develop projects and credit enhancement to attract commercial financing.

JEL Classification: H54, (Infrastructures, Other Public Investment and Capital Stock); H41 (Public Goods); H81 (Governmental Loans, Loan Guarantees, Credits, and Grants)

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Small-scale infrastructure financing needs in developing countries

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The inadequacy of their core, economic and social physical infrastructure is a common characteristic in most developing countries.[2] The World Bank estimates that $1.1 trillion in annual infrastructure expenditure is needed in developing countries through 2015, of which the greatest needs, as a share of GDP, are in low-income countries, estimated at 12.5 percent of GDP (World Bank, 2011). Efforts are underway to increase infrastructure spending in developing countries. However, most finance has been directed towards large-scale projects. Specifically, large transportation infrastructure, energy production and distribution, communications, water and waste management projects receive substantial funding from national governments, development finance institutions and donors. For example, large multilateral development finance institutions tend to focus their financing on large-scale projects that exceed $30 million (Table 1).

Table 1
Infrastructure finance from World Bank and regional development banks (2010)

	World Bank		*Regional Development Banks*			
	International Bank for Reconstruction and Development, International Development Association	*International Finance Corporation*	*African Development Bank*	*Asian Development Bank*	*European Bank for Reconstruction and Development*	*Inter American Development Bank*
Total size of infrastructure programs	$19.4 billion	$1.62 billion	$4.11 billion (urban)	$10.37 billion	$620 million*	$5.4 billion
Focus of the programs	Power, transport, and water	Private power, transport, and water	Power, transport, and water	Power, transport, ICT, and water	Municipal infrastructure	Power, transport, and water projects
Typical size of infrastructure projects	> $30 million	$1 million to $100 million	$86 million (average)	> $30 million	$19.4 million (average)*	> $30 million

Source: World Bank, IFC, AfDB, ADB, EBRD, IADB, Annual reports for 2010.

* Total amount refers to targeted programme for small and medium-scale municipalities only. Other support programmes in the power, transport and water sector exist within the EBRD, which are typically large –scale.

The problems of small-scale infrastructure, especially that in rural areas, has received far less attention.[3] The UN system has been supporting small scale infrastructure since the 1970s through the ILO's Employment Intensive Investment Programme (ASIST). Some development finance institutions have recently begun contributing indirectly to investment funds that are targeted to small and medium sized

1 The underlying concepts and proposed pooled financing structure were developed by the UN Capital Development Fund (UNCDF) in Partnership with the Global Clearinghouse for Development Finance for the UNCDF "Local Finance Initiative (LFI)," launched in 2010 with support of the Swiss Agency for Development and Cooperation (SDC). For information, see http://www.uncdf.org/local-finance-initiative. We would like to thank Christina Martell (University of Colorado), Christian Kingombe (Overseas Development Institute), and DESA colleagues Anisuzzaman Chowdhury, Krishnan Sharma and Michael Kunz for comments on an earlier draft.

2 In this paper we focus on physical infrastructure characterized by high initial capital costs. Here we use the term "core" infrastructure to refer to public works facilities that provide for transport, water/waste management, power generation/distribution and communication (ICT) services; "economic" infrastructure to refer to facilities such as warehouses, transport depots, markets, processing plants, etc.; and "social" infrastructure to refer to schools, hospitals, clinics, etc.

3 For the purposes of this paper we use the term "small" infrastructure to refer to projects that require less than the equivalent of $30 million in initial capital expenditures.

enterprise (SME) development and smaller scale infrastructure projects. However, these amounts have been small (e.g., IADB contributed $60 million through the "Corporación Interamericanapara el Financiamiento de Infraestructura S.A" in 2011). Similarly, some bilateral agencies have recognized the need to increase small-scale project support. For example, the Japanese government has vowed to increase small-scale projects, which currently make up for only 0.3 percent of its total official development assistance (VNA, 2011). More recently, the UN Capital Development Fund (UNCDF) has launched the "Local Finance Initiative (LFI)" to address the specific issue of mobilizing domestic finance for smaller scale rural economic and industrial infrastructure projects, with pilot programmes on-going in Tanzania and Uganda.[4]

Small-scale infrastructure is the missing last mile—quite literally in many cases. While there is a need for more air and seaports, railroads and highways, in developing countries, these alone do not allow people and goods to reach their final destinations. Local feeder roads are needed to connect homes, farms and factories to the national transportation system. Likewise small crop bulking stations are needed to facilitate the storage of crops before they are sent to larger warehouses and processing facilities. Local markets are needed to provide the end of the retail distribution system. Small-scale power generators are needed to fill the gaps remaining in the national power grid. Small-scale processing facilities such as a powered hammer mills are needed to provide the first stage of processing for industrial value chains. Moreover, small-scale social infrastructure such as health centres, clinics and (primary community) schools are necessary in order for key services to be readily accessible to communities. In many countries, small-scale infrastructure needs are taken care of by local governments and private entrepreneurs, but in developing countries, especially low-income countries, local governments and private entrepreneurs have great difficulty in fulfilling this role on their own (Billand, 2006).

A trend towards decentralization and the pursuit of local economic development has further amplified local needs for small-scale infrastructure finance.[5] For the past several decades, governments in both developed and developing countries have been decentralizing fiscal, political and administrative responsibilities (UCLG,2007). In many cases, local governments are now promoting local economic development (LED). LED is a "bottom up" process in which public, private and civil society actors work collectively towards improving the competitiveness and employment prospects of a defined territory (LEDNA, 2011).

Usually it involves promoting productive sectors and value chains in which the area has or could have comparative advantages. In pursuing LED, local governments often find that inadequate small-scale infrastructure is the major impediment they face.

Yet, with lower fiscal transfers from the central government, little direct support from donors (who prefer to deal directly with central governments) and little own source revenues they frequently cannot provide the necessary funds on their own. With the rather scarce financial resources at their disposal, they face difficulties in meeting operating expenditure requirements and have little revenue to invest in infrastructure. While local governments in high-income countries can rarely fund all their infrastructure needs out of

4 The UNCDF Tanzania LFI Programme is funded by UNCDF and the Tanzania One UN Fund, and the UNCDF Uganda LFI Programme is funded by the Swedish International Development Cooperation Agency (Sida). For more information on LFI, see http://www.uncdf.org/local-finance-initiative.

5 Technological progress provides a further rationale for these small-scale investments into infrastructure. Specifically, recent advances in technology, materials, telecommunications and other developments (e.g., progress with regard to the decentralized generation of power from locally available renewable resources) have helped provide infrastructure services even more cost-effectively through small-scale investments.

current revenues, they usually can borrow from banks or issue bonds. Unfortunately, this is rarely an option for local governments in most developing countries due to their limited creditworthiness or the lack of credit ratings at the local or international level (Platz, 2009).

Likewise, the private sector is rarely prepared to provide either equity or debt financing for small-scale infrastructure projects on its own. Local entrepreneurs and poor communities demonstrate skill, knowledge, and willingness to shoulder risks, but are often not recognized by formal institutions and lack access to the longer-term finance necessary for infrastructure development and scale-up. For example, based on its field experience, DFID identifies certain barriers, including high market and project development costs, difficulty to access pre-investment financing, high commercial risks given the low effective demand and limited knowledge about best practice and scaling up, as the reasons for low private sector financing in small-scale decentralized energy services (DFID, 2007).

Resolution of this dilemma will require external assistance. Local governments need external assistance in finding ways to overcome the limitations of weak financial systems, in putting together "bankable" projects and in mitigating the perceived technical and financial risks involved in small infrastructure investment.

Potential sources of financing for small scale infrastructure

In developing countries, funding for capital expenditures on infrastructure can come from a number of sources. The primary ones are:

- Public sector budget
- Official development assistance (ODA)
- Private sector

The public sector provides the largest share of funding for infrastructure. This comes either from current revenues or public borrowing. In low-income countries, a significant share of funding comes from ODA, mostly in the form of grants. The private sector's share of infrastructure funding in low-income countries is also important, although it tends to be concentrated in specific sectors such as ICT. It is provided in the form of equity or debt invested primarily in large infrastructure projects. Public-Private Partnerships (PPP), where the private sector participates directly with the public sector in projects, is another form of financing. According to data compiled by the Africa Infrastructure Country Diagnostic (AICD), capital expenditures for large-scale core infrastructure projects in Sub-Saharan Africa in 2001-2006 averaged $24.9 billion annually. Of this 38% came from the public sector, 24% from ODA (both OECD and non-OECD countries) and 38% from the private sector. If small-scale infrastructure spending were included, the public sector's share would likely be significantly higher (World Bank, 2009, Table 0.4, page 9).

Given the nature of infrastructure—high initial sunk cost and long service life—most public and private sector expenditures come not from current revenues but from longer-term forms of financing and the bulk of this financing comes from domestic sources (Irving & Manroth, 2009).[6] In developing countries the

6 Local currency financing is needed as in the majority of cases, since most small-scale infrastructure generates revenues in local currency. In such cases, foreign currency financing is less desirable as it entails exchange rate risk or the added expense of hedging (if this protection is available). In the past many infrastructure projects have gotten into financial difficulties when exchange rate movements have greatly increased the domestic currency costs of their foreign currency debt service obligations.

Table 2
Deposit money bank assets/GDP by income group
(mean averages)

Country income group	*Deposit money bank assets/GDP*	
	2000	*2009*
High income	88%	129%
Upper middle income	45%	63%
Lower middle income	36%	48%
Low income	16%	25%

Source: World Bank, 2010.

institutions that can best serve as the channels through which private domestic savings are gathered and then allocated to productive long-term investments of various types are banks, pension funds and other institutional investors.[7] Banks have served as the primary source of financing for infrastructure in developing countries (Sheppard, 2003). Moreover, their assets have grown significantly, in relative and absolute terms over the last decade (table 2).

However, they are limited in their ability to provide long term financing as their major source of funding is short-term deposits. To avoid maturity mismatches banks normally cannot provide loans with tenors of more than five years. If banks receive longer term funding, most commonly via long-term loans from development finance institutions (DFIs), they can provide longer tenors. However, the amount of such DFI funding is limited. To circumvent the maturity mismatch problem, banks can offer short term financing that requires that the loans be refinanced in the future. Yet, this exposes the banks to refinancing risks that must be passed on to the infrastructure project through increased risk premiums on the loans (Rostogi and Rao, 2011).

An important potential source of long term financing for infrastructure are pre-funded pension plans that have experienced rapid growth in many developing countries in recent years. Pension funds in developing countries have risen from an estimated US$422 billion in 2001 to US$1.4 trillion at the end of June 2010 (JP Morgan, 2010) (figure 1). Following the advice of international financial institutions, particularly the World Bank, many developing countries have established such pension systems. Given the rather young population of most of these countries and the recent introduction of such pension plans, the assets held by such pension funds are accumulating very rapidly in many countries.

Since payments from these funds occur over a long term and are highly predictable, these pension funds should be investing in long-term assets. Thus, they are an appropriate source for funding for infrastructure, which can provide stable long-term returns. However, in many countries pension funds do not have the skills needed for investing in infrastructure projects. And in most countries, the government regulates pension fund investments and often limits their ability to invest in infrastructure projects directly. To the extent that they are engaged in funding infrastructure it is most commonly through the purchase of government bonds which are then used by the government to fund projects.

In addition to pension funds, there are other institutional investors, such as insurance companies, mutual funds and other collective investment schemes that may invest in infrastructure projects. Usually some portion of their assets needs to be invested long-term in order to match their liabilities. Assets from whole life insurance policies are a particularly appropriate source of funds for long-term investments.

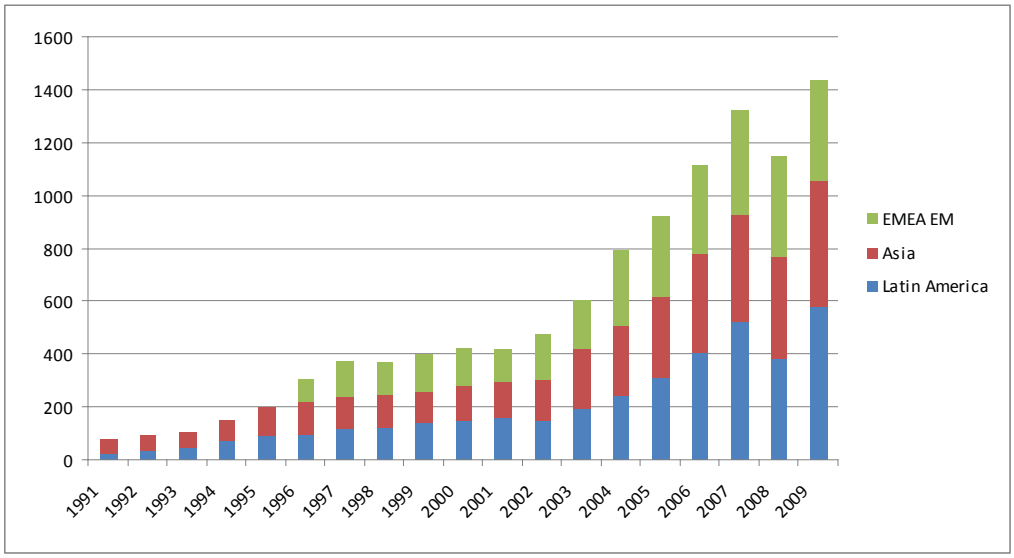
7 Long-term financing is needed as the initial costs of infrastructure projects are high but their service lives are long. In order for revenues to cover debt service payments, operating and maintenance costs and produce a positive return, it is usually necessary for the capital costs of the infrastructure to be spread over many years. The revenue generated by an infrastructure project must be sufficient to cover operating costs and debt service payments, and provide a return to equity investors. In terms of obtaining a sustainable level of debt service payments, often the length of the repayment period is critical. While operating costs and return on equity should be roughly the same every year, once the infrastructure is in place and generating revenue, the level of debt service payments depends on the length of the period allowed for repayment of the debt.

Whether these entities do invest in infrastructure is determined by the regulatory guidelines under which they operate, their ability to analyze infrastructure projects and the availability of creditworthy infrastructure projects offering good returns.

In many developing countries the growth of pension funds and other institutional investor assets has been so rapid that they have outstripped the capacity of the local markets to provide the types of investments such institutions need. Lacking suitable long-term investment options, these assets end up being deposited in banks, earning relatively low rates of return and even distorting the local financial markets by creating excess liquidity. If these assets could instead be used to safely finance small scale infrastructure projects this would not only help develop the economy but it would strengthen the local capital markets as well.

The question is whether the domestic savings held by institutional investors in developing countries can be mobilized to provide long-term funding for small infrastructure projects.

Figure 1
Pension fund asset growth for non-OECD countries by region in billions of USD (2001-2009)



Source: Bloomberg LP, J.P. Morgan estimates.
Note: EMEA EM refers to emerging economies in Europe, Middle East and Africa.

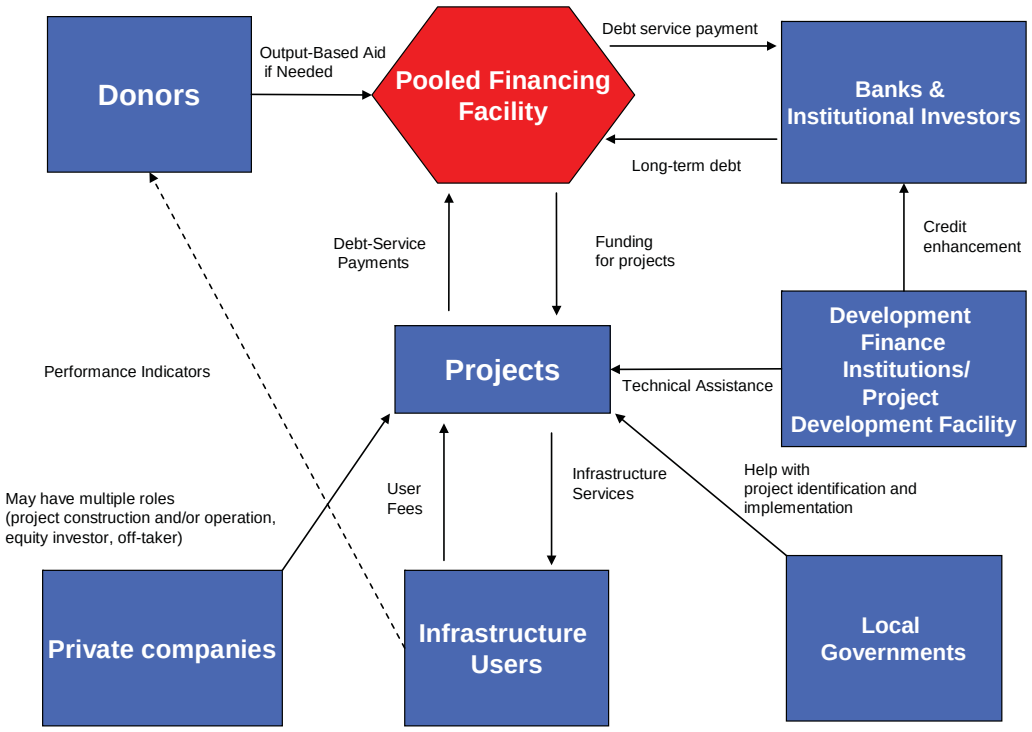
A proposal for a pooled financing facility to tap domestic capital

To facilitate financing for small-scale infrastructure projects in a developing country setting we propose using donor resources to leverage domestic savings. A pooled financing approach designed especially for financing small rural infrastructure on a multi-sector basis was developed in 2009 by the UNCDF "Local Finance Initiative (LFI)" in partnership with the Global Clearinghouse for Development Finance.[8] This approach includes technical assistance, risk mitigation tools and incentives that can mobilize private sector finance,

8 The use of pooled facilities and related financing mechanisms have been developed in a wide range of countries. Examples include the United States (state bond banks, water and waste water treatment revolving loan funds, equipment lending pools); Kenya (K-Rep Bank pooled water facility); Czech Republic (MUFIS); South Africa (MIIU); India (Tamil Nadu pooled water facility); and other applications in the Philippines, Colombia, and Morocco. For the UNCDF approach initially set forth in 2009 for diversified pools of rural infrastructure projects, see "Financing Local Infrastructure: Part One Report—The Tanzania Environmental Scan," page 43, http://uncdf.org/gfld/docs/infradev.pdf

banks as well as institutional investors, including pension funds, over the longer term. All the elements of this proposal have been tested in infrastructure financing programs already carried out in a number of countries. Some of these programs are described in the appendix to this paper.

Figure 2.
Possible finance mechanism for small-scale infrastructure



Source: "Local Finance Initiative (LFI)"—A partnership between the UN Capital Development Fund and Global Clearinghouse for Development Finance.

The above structure illustrates how the projects are financed through a pooled facility by the domestic debt markets. This basic structure would be modified as needed to fit the country requirements, targeted investors, and projects sponsors from the public and private sectors.

Development finance institutions would provide the technical assistance and funding necessary to develop "bankable" project proposals. The projects would need to be able to generate sufficient revenue to cover the projected debt service payments. The revenue can be generated by market sales, off-take agreements, user fees, output-based aid payments by donors, etc.

Local governments would not borrow themselves. However, they could identify the small infrastructure project most critical for local economic development. They can also facilitate and support the projects or even invest in them (in cash or in kind, for example by providing land or access/usage rights).

In many instances, private companies would also play an important role. They can contribute their knowledge and skill in arranging for financing, in carrying out construction projects and in operating infrastructure facilities. Moreover, they can provide equity investment for projects or they may provide off-take contracts to help secure future project revenues.

A number of projects would be financed through a pooled financing facility, or similar credit enhancement financial mechanism. The investors in the facility would have support from one or more development finance institutions that would provide credit enhancement (such as partial credit guarantees or a first-loss facility).

The facility would be structured using a non-recourse project finance approach, whereby loans made by the facility would be repaid solely from the cash flows generated by the projects–not from the general financial resources of the project sponsors or local governments. This would shield local government revenue from external creditor claims. Individual projects would be structured so that certain risks, such as construction cost, technical performance, and environmental compliance, are mitigated through contractual undertakings by third-parties.

The pooled financing facility would be managed by a strong local bank (the Fund Manager), that would take the principal responsibility for credit analysis of prospective projects. The Fund Manager would seek to obtain participation in the facility from several other local banks and institutional investors. This would spread the credit and reputational risks of participation and enable the participants to improve their skills in credit analysis of project finance.

After the initial portfolio of projects has been operating successfully for a few years, it may be possible to restructure the loans into securities that could be refinanced on the local capital market. Pension funds and other institutional investors could invest into senior tranches (those tranches that have the highest repayment priority) thus freeing the banks funds to be redeployed in additional projects. The projects being refinanced would have established good payment performance records and thus be viewed as lower risk, which would make them more attractive to institutional investors such as pension funds.

This model stands in contrast to the more traditional on-lending model of assistance: In order for on-lending to work, there is a need for a lender who has the ability and willingness to make the necessary loans.[9] The proposed mechanism assumes that there are few local banks that are prepared to help local governments identify projects, find private sector project sponsors and prepare "bankable" projects. It is too costly for the banks to do this and often the necessary skills are in short supply. Thus, we propose that donors take the lead in the area of project preparation. We are also assuming the local banks have no experience in financing small rural infrastructure projects and will require incentives to provide the funding on acceptable terms unless the donor community is willing to assist them in overcoming this barrier. Hence, we propose that this can be done by risk sharing between banks and donors and/or DFIs.

Overcoming technical and capacity challenges to financing small-scale infrastructure projects in developing countries

To illustrate the benefits of our proposal we will discuss how the mechanism would help overcome typical financing constraints for small-scale infrastructure in developing countries.

9 For example, the USAID DCA has many successful on-lending programs in low-income countries designed to provide financing for SMEs, farmers, micro-finance institutions, etc. For these programs they try to find a local bank that has the ability--for the specific sector involved--to make the necessary credit decisions to make good loans, adequate surveillance capacity to monitor loan performance and recovery capabilities to deal with defaults. They then provide financial support (largely via partial credit guarantees) to incentive the banks to expand their lending in the targeted sector. There may be some effort by the banks or the USAID to find borrowers and help them apply for financing from the participating banks, but this is a relatively modest effort, usually involving publicizing the availability of funding (USAID 2010).

Financing infrastructure projects is seldom easy—anywhere. In part, this is because of their "lumpiness"—they require the commitment of a relatively large amount of capital at one time—and their uniqueness—every infrastructure project is different due to the necessity of engineering for local conditions, dealing with local actors and serving local customers.

Additional problems may arise with financing small-scale infrastructure projects in developing countries.

High transaction costs

- When infrastructure projects are small (say below the equivalent of US$30 million), it is especially difficult to engage banks and institutional investors. The costs of evaluating, executing and monitoring infrastructure projects are always high. For small projects, the ratio of such costs to the returns that can be earned is simply not very attractive to lenders.

Financial sector impediments

- Domestic bank and capital markets are usually under-developed and are ill-prepared to channel domestic savings into financing for local governments to fund small-scale infrastructure projects needed for local economic development.

Lack of project development capacity

- Local governments usually have difficulty in formulating "bankable" projects, in part due to their inexperience and in part due to the lack of precedents upon which to base their projections of costs and revenues.

Lack of credit history

- Lenders are wary of infrastructure financing because there is little historic evidence concerning the credit risks that local infrastructure projects will entail.

Cost recovery challenges

- The cost of financing may be too high to allow for politically and socially sustainable pricing of infrastructure services in developing countries.

Below we discuss each of these barriers and outline how they could be broken down with the help of the proposed pooled financing facility in order for domestic savings to be channelled more freely into small-scale infrastructure projects.

High transaction costs

Efforts related to identifying and bundling viable projects, matching potential investors with project owners, and the securing of experts needed to prepare the necessary market, engineering and financial analyses to prepare "bankable" projects create large up-front costs for small-scale infrastructure projects. These costs represent a much larger share of the overall costs in small projects compared to large-scale projects. Thus donors will need to cover a significant portion of these costs. In addition these transaction costs are lowered if a common project development team is established. Then the process of project formulation and documentation can be standardized, local expertise can be developed and utilized effectively and overhead costs can be spread across a number of projects. Pooling projects can also make it more economical for investors to evaluate, execute and monitor the projects.

Financial sector impediments

While the assets held by banks and institutional investors in developing countries are growing rapidly, very little of these assets are being channelled into small-scale infrastructure. Based on the experience of the developing economies, financial systems evolve over time to a stage where local governments have the ability to borrow on their own and fund the small projects they feel will promote local economic development. Normally, the process of establishing a relationship with the lender or obtaining a credit rating to access capital markets takes decades. However, there may be opportunities for accelerating the process. Rather than waiting for local governments to become creditworthy on their own, it may be possible for small-scale local infrastructure to be financed using the "non-recourse" project financing approach proposed here. Instead of lending decisions being based on the ability and willingness of local governments to repay, it is the financial viability of the infrastructure projects themselves that is paramount. If a projects fails (does not service its debts) the burden is shared among the participating parties. The lending banks and any providers of credit enhancement would bear the costs of the payments not made. The local governments and private sector project sponsors would lose the equity they put into the project. Thus the risks are shared in such a way that there should be little risk of moral hazard.

The approach proposed here can also be a bridge to more traditional funding of infrastructure via the domestic bond markets. In recent years, many low income countries have achieved the necessary regulatory and legal environment and sufficiently credible monetary policies to allow issuance of long term, fixed rate local currency bonds.[10] Once pools of small infrastructure loans have been established and financed, the next step could be to re-structure these loans into asset based securities that will be attractive to long term investors such as pension funds and life insurance companies.

Lack of project development capacity

Local governments are in a good position to identify projects that are needed to support local economic development. However, they are often not capable of identifying those projects that can be financed by banks and institutional investors or of preparing projects for such financing. This is an impediment that outside intervention can help overcome.

If a project is to be funded on its own, there must be sufficient revenue generated to cover its operating costs and to service the debt that will be incurred to pay for the capital costs. (The revenues can come from sales, user fees or governments payments for services or capacity.) Thus, there needs to be a detailed and realistic financial analysis of the project. Inputs to this financial analysis include a marketing study to establish the likely project revenues and an engineering/design study to establish the likely project costs. There is also a considerable amount of legal work needed to establish the rights and responsibilities of the various parties' involved in the project, and to define ownership rights to the financial flows and assets associated with the infrastructure.[11]

10 These countries have shown that it is possible for even lower income countries to escape the domestic component of so-called "original sin" (Mehl and Reynaud, 2005). For example, at least four low income countries in Sub-Saharan Africa (Burundi, Kenya, Mozambique, Tanzania and Uganda) and five lower-middle income countries (Angola, Cape Verde, Lesotho, Nigeria, and Zambia) have issued government fixed interest rate bonds with tenors equal or greater than 10 years (AfDB, 2010). Issuance of such government bonds leads the way for the issuance of longer tenor non-sovereign bonds.

11 Non-recourse project financing normally requires the establishment of a special purpose vehicle (SPV), a legal entity created to fulfill a narrow, specific function while isolating the associated parties from financial risk.

The costs of putting together a "bankable" project proposal for an infrastructure project can therefore be substantial. Thus, there may be a need for external assistance in order for local government to be able to deliver "bankable" project to lenders. The proposed arrangement in Figure 2 illustrates that development partners could help with the formulation of "bankable" projects, through targeted technical assistance. Over the longer term, local governments and other project sponsors would gain experience in project development, without being at risk of having to pay project debts. Moreover, to facilitate project preparation and to reduce their costs, "project development facilities" can be created. A project development facility can take a variety of forms and perform different roles depending on the need. In smaller or centralized countries, the facility may be national in character. In larger or decentralized countries, the facility may operate at a regional or state/provincial level. For instance, the Municipal Infrastructure Investment Unit (MIIU) in South Africa provided financial, technical, and managerial support to municipalities to secure financing for infrastructure projects. (See appendix for more details). A project development facility may also help to structure and market structured finance securities to pension funds and other domestic investors seeking long term assets.

Lack of credit history

Whether funding can be secured from the financial system—and at what costs—will be determined in large part by the risks creditors think the project entails. Often the level of risk is estimated by looking at the experience creditors have had with similar projects in the past. However, since little non-recourse project financing has been undertaken for infrastructure projects in developing countries, particularly in low-income countries, history cannot provide much guidance. Instead, the project's creditworthiness will likely be judged based on (1) a critical analysis of the information provided in the project proposal and (2) the availability of assets pledged by the borrower. Lenders are normally cautious and focus on all the problems that occur in the construction and operation of the infrastructure project and they are likely to require collateral that can be taken in the event of default. (In fact, banks often make lending decisions largely based on the value of assets pledged by a borrower rather than a borrower's expected revenues and cash flows. Borrowers such as small businesses often must satisfy collateral requirements well in excess of 150% of the loan amount.)

Even if lenders are willing to finance the project they may charge a high risk premium, which pushes up the cost of financing and may make it non-viable from the perspective of achieving socially and politically sustainable service pricing. In consequence, for some projects to be financed, it may be necessary for some external group to assume part of the credit risks. The proposed mechanism meets the lack of credit history with extra measures to reassure investors wary of venturing into the largely unknown territory of small-scale infrastructure finance. Project performance would be ensured through independent consultants (including engineers) who would perform market assessment studies (including capacity to pay) and audit the costs of construction. Segregated accounts would control cash flow and insure that cash is used to pay, first, operating expenses; then maintenance expenses; next, debt service and, finally, dividends to project owners. The syndicated lenders would assure financial accountability and transparency to the pooled financing facility, which would be at risk and would use typical project finance structures to protect their interests. Over the longer term, lenders would gain experience in project finance credit analysis and, having gained a better understanding of project risks and how they can be mitigated, these lenders would eventually be able to provide financing with lower or no credit enhancements.

Cost recovery challenges

Revenues generated by small-scale infrastructure finance projects may be relatively modest. In order to have politically and socially sustainable pricing of infrastructure services subsidies may be necessary to finance the

spread between lending interest rates and feasible borrowing interest rates. Development Finance Institutions (DFIs) could help subsidize the cost of financing through output based aid. For example, a programme for small community managed piped water projects in Kenya uses output based aid payments, combined with technical assistance and subsidies to mobilize market based financing from a domestic private sector microfinance institution, K-Rep Bank. (K-Rep Bank is a licensed commercial bank that specializes in microfinance products and services.) The output-based subsidy repays up to half the loan which makes the monthly repayments more affordable for the community. The subsidy payments are made upon successful delivery of the outputs. Outputs are measured by change in the service coverage and change in revenues collected, as a result of increased service and improved payment collection (see appendix for more details). Moreover, DFIs could help strengthen revenue collection capacity where the autonomy of the local government or project owner may be limited.

Conclusion

While funding for traditional large infrastructure in developing countries is still inadequate, the mechanisms for providing such funding are well established. It is the "last mile" of infrastructure needs—small-scale infrastructure essential for local economic development—that now needs to be addressed. Financing for small infrastructure presents special challenges that will require new financing mechanisms. Little fiscal autonomy and insufficient fiscal transfers from the central government have left local governments with few resources to finance small-scale infrastructure. We have argued that a carefully calibrated pooled project finance approach combined with technical assistance and credit enhancements as set forth in the UNCDF Local Finance Initiative, could help generate the necessary resources. For our proposed mechanism, local governments would not take on loans they could not shoulder (or could not access due to low creditworthiness). Rather, they could work with donors and private sector companies to identify and put together bankable infrastructure projects that can be financed by local banks and capital markets on a non-recourse basis. Consequently, those projects would benefit local economic development without an increase in municipal debt.

While we believe this financing approach holds significant potential, it would require a concerted and well-coordinated effort of a range of stakeholders and the private sector. In this connection, DFIs and donors have an important role to play. In the context of this proposed finance approach, DFIs and donors could significantly leverage their limited funds by using them to mobilize funding from local institutional investors through partial guarantees, loan subsidies, technical assistance and capacity building.

For the proposed mechanisms, we have recommended that donors and DFIs work directly with local governments, private companies and banks to provide this support. However, central governments could be brought into the picture. This could be done if donors and DFIs help increase the central government capacity to assist in project development and credit enhancement (and provide funding for this when necessary). If a central government is willing and able to take on this role, this could work and may be a more effective and sustainable model in the long run.

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Appendix: Field-Tested Local Infrastructure Financing Approaches

There have been many efforts to fund small infrastructure projects that have successfully tested various elements of the approach discussed in this paper. Below we briefly describe a few of these.

K-Rep Bank's Maji Ni (Water is Life) Program—Kenya

The Maji Ni Maisha Program illustrates the use of project development assistance, output based aid payments and partial credit guarantees to catalyse bank lending.

This programme for small community managed piped water projects in Kenya uses output based aid payments, combined with technical assistance and subsidies to mobilize market based financing from a domestic private sector microfinance institution, K-Rep Bank. (K-Rep Bank is a licensed commercial bank that specializes in microfinance products and services.) The project was created by three multi-donor trust funds. The World Bank administered Water and Sanitation Program (WSP) developed and manages the project. The Global Partnership on Output-Based Aid (GPOBA) provides output-based aid grants. The Public-Private Infrastructure Advisory Facility (PPIAF) provides initial feasibility studies and provides on-going technical support. To reduce the collateral required from the borrowers, K-Rep Bank purchased a partial credit guarantee from USAID's Development Credit Authority which covers 50 percent of the loan principal.

The projects vary in size from US$60,000 to US$200,000, providing from 50 new water connections to 600. The financing is provided on a project finance basis. The community provides equity (20 percent of project cost) and K-Rep finances the remaining 80 percent through a loan with a maximum tenor of five years. The output-based subsidy repays up to half the loan which makes the monthly repayments more affordable for the community. The subsidy payments are made upon successful delivery of the outputs. (Outputs are measured by change in the service coverage and change in revenues collected, as a result of increased service and improved payment collection.)

As of mid-2011 a dozen water systems have been financed with over $1 million in debt finance from K-Rep Bank and $300,000 in equity contributions from local community organizations. The pilot project has now been expanded nationally, targeting over 165,000 beneficiaries in 55 communities, using additional subsidy funds from the European Union.[12]

Philippine Water Revolving Fund

This Revolving Fund illustrates the use of subsidized long term funding to banks and partial credit guarantees to catalyse bank lending for small infrastructure projects in the water sector.

The Philippine Water Revolving Fund (PWRF) was one of the first large scale revolving loan programs tested in a developing country. The program targeted creditworthy local water supply and sanitation service providers in the Philippines. These providers previously had no experience in borrowing from commercial sources. And commercial loan tenors were too short and the interest rates too high for them to afford to borrow on fully commercial terms.

The crux of the PWRF's design is the leveraging of overseas development assistance with private sector resources. The program combines Japan Bank for International Cooperation (JBIC) funds lent to

12 Kameel, Viji (2009). "Leveraging Private Sector Finance for Rural Piped Water Infrastructure in Kenya: The Use of Output-Based Aid", Note Number 30, Global Partnership on Output based Aid.

the Development Bank of the Philippines (DBP), and funds from the Private Financing Institutions (PFIs), i.e. commercial banks, using their own sources of funds. JBIC extends highly concessional loans to DBP with maturity of up to 30-40 years with at least 10 years grace. The JBIC loan is guaranteed and covered for foreign exchange risk by the Government of the Philippines. The co-financing arrangement is a means to initiate PFI participation in local water service provider lending, which heretofore has been largely provided by government financing institutions and other government agencies.[13]

The co-lending arrangement is carried out on a transaction by transaction basis. DBP as the administrator acts as the main loan originator and lead arranger. One important feature is the ring-fencing of the reflows from the DBP/JBIC loan during the grace period, to build a special account that could provide liquidity cover to PFIs, as well as use for new loans or credit enhance future bond issues.

The Philippine Government (GRP) is involved by providing a sovereign guarantee to JBIC. U.S. AID is also involved, as it provides a partial (30%-50%) credit guarantee to the PFIs through a Local Government Unit Guarantee Corporation (LGUGC). The LGUGC provides the participating banks with an 85% credit guarantee. Under this guarantee scheme, the PFI, in case of loan default, is assured of continuity of payment of scheduled amortizations due, up to maturity of loan. (There is no acceleration of payments in the event of default.)[14]

The blending of funding from DBP and PFIs means that the water and sewer service providers are able to obtain loans with 7 to 15 year tenors (up to two years grace period) at interest rates of 9% to 11%. (The DBP lends up to 75% of the loan requirement of LGU, which percentage can decrease to 50% as the private banks gain confidence in lending under the program.)

Tamil Nadu Pooled Financing - India

The Tamil Nadu program illustrates the use of project pooling and partial credit guarantees to catalyse bank financing for small water and sanitation infrastructure projects.

Pooling arrangements allow small and medium cities to aggregate their financing needs and diversify credit risk, which serve to attract investors as well as spread the transaction costs among a number of borrowers. In 2002, using a pooled financing facility, thirteen small municipalities in the State of Tamil Nadu, India obtained funding for water and sanitation projects at longer tenors and lower cost than would have been otherwise possible.

The Tamil Nadu's Municipal Urban Development Fund issued pooled bonds for water and sanitation projects of participating urban local bodies (ULBs), with a partial (50%) credit guarantee from U.S. AID's Development Credit Authority. Other credit enhancement measures were used as well, namely, (a) escrow accounts funded by the ULBs, (b) a debt service reserve fund set up by the state government that would be replenished by diverting ULB transfer payments and (c) a sinking fund for principal repayment.[15]

13 Alma D. Porciuncula (2009). Philippine Water Revolving Fund, Development Alternatives, Inc., 2009. http://d130148.u37.wsiph2.com/eascongress/docs/post-congress/Theme6/01_Public_Private_Sector_Invstmt/09_Alma%20Porciuncula.pdf

14 US Agency for International Development (2009) Concept Paper for Water Supply and Sanitation Project Development Facility, The Philippine Water Revolving Fund Support Program. http://pdf.usaid.gov/pdf_docs/PNADO029.pdf

15 World Bank (2003) Project Finance Model for Water and Sanitation Projects: The Tamil Nadu Water and Sanitation Pooled Funding (WSPF), Note No. 31, 2003. http://info.worldbank.org/etools/docs/library/86463/ses2.1_pooledfinmodelwater.pdf

The escrow accounts were funded by the ULBs from general revenues and before bond issuance, in an amount equal to one year's worth of their respective loan obligation to TNUDF. These funds were held in secure, short-term fixed deposits in the name of the ULB and available to cover debt service payment shortfalls. The state government funded the DSRF at a level equal to 1.6 times annuity payments (or comparable market negotiated level). The debt service reserve is also held in short-term fixed deposit investments or other liquid instruments in the name of the fund. If drawn upon to make annuity payments to bondholders, the state government will replenish it through either a government order or by diverting municipality transfer payments. U.S. AID guarantees 50 percent of DSRF repayments and is triggered when the DSRF is exhausted and has not been replenished by the state government within 90 days. Critical to the success of this transaction was a relatively stable regulatory framework and transparent ULB budgets. These factors were positively influenced by long-term and intensive U.S. AID technical assistance.

Tamil Nadu's Municipal Urban Development Fund, a legally registered trust, issued bonds and used the proceeds to provide financing for the individual projects. This trust has joint public-private ownership. U.S. AID also provided intensive and long-term technical assistance to the municipalities. (A similar $21.7 structure has been established in the state of Karnataka in 2003.)

The local currency bonds (totaling 304 Indian rupees, or approximately US$6.4 million) had a maturity of 15 years. There are equal annual principal payments starting year one at an interest rate of 9.2% per year. The bonds were rated on the local scale AA by Fitch, which was sufficient to attract Indian institutional investors. (Before this transaction, the term of municipal bonds had been confined to a maximum of seven years.)

Municipal Infrastructure Investment Unit (MIIU) – South Africa

The MIIU Program illustrates the use of project development assistance and partial credit guarantees to catalyse bank financing for municipal infrastructure projects of various types.

The Municipal Infrastructure Investment Unit (MIIU) was created by the Government of South Africa in 1998 as a non-profit corporation with the mission to provide technical and grant assistance to municipalities to help them access private financing and expertise to meet their municipal services infrastructure needs. Over the period 1998 to 2006 USAID and the Development Bank of South Africa provided funding for technical assistance to help municipalities prepare projects and secure bank financing. In most instances, without the grants, municipalities would not have been able to finance the project development work or negotiate effectively with potential private partners. USAID also provided partial credit guarantees to provide an incentive for the banks to lend to the projects. The projects were designed as partnerships between the municipalities and private sector investors in a number of services, including water/wastewater, solid waste, airports, markets, bus service, municipal revenue management, electricity, and parking facilities. Some projects were able to achieve full cost recovery from users and beneficiaries, but other projects providing services to the poor were structured similarly to the out-output based subsidies model. The MIIU also helped municipalities improve their collection of charges and taxes through revenue enhancement.[16]

16 PADCO (2006). "Municipal Infrastructure Investment Unit (MIIU) Final completion Report" Volume 1, Main Report prepared for USAID.