

# FINANCING INFRASTRUCTURE

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## **1 INTRODUCTION**

### **Backlog in service delivery**

Many households in low and middle-income countries are not connected to any infrastructure network. Another part of the population in these countries only partly benefits of the services and goods distributed through the infrastructure networks.

### **Traditional sources of finance**

Traditionally national governments have the responsibility to finance the investment costs to construct the infrastructure. Most governments generate these funds from all kinds of taxes and non-tax receipts. Governments of low and middle-income countries also receive grants and loans from bilateral and multilateral development organisations like DFID and the World Bank. Nonetheless many low and middle-income countries lack the financial resources to catch up with the backlog in infrastructure provision. Many households will remain deprived from any infrastructure distributed services or goods for decades to come, if alternative sources are not made available.

### **Local government participation**

Traditionally local governments only had to pay for the operation and maintenance of the infrastructure. The national government planned the infrastructure investment with little concern for the consequences for the local governments' financial capacities.

More and more countries are transferring a part of the responsibility of raising resources for investments to local governments. The national government merely supplements the incomes of the local governments. Its contribution may be tied or untied. If the contribution is tied, it has to be spent on a specific program or project. Untied funds can be used for any purpose. Local governments have the opportunity to generate other resources through property and income taxes, non-tax revenues, user charges, loans and may receive grants from donors.

Property taxes are often tied to the provision of infrastructure. It is used to finance services like street lightning and other infrastructure related services. In particular so, when it is difficult or perceived unacceptable to exclude defaulters from access and therefore it is not possible to install user-charges. Unfortunately many local governments fail to generate sufficient funds through property taxes.

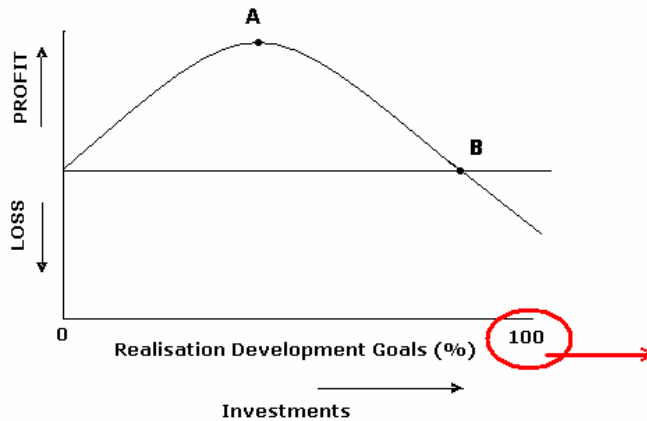
### **Need for alternatives**

It is obvious that governments that do want to catch up with the backlog have to look for alternative sources of finance. This document discusses a few alternatives of generating additional resources to finance infrastructure investments. The document does not include cost recovery methods, which are discussed in Basics in Planning<sup>1</sup>.

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<sup>1</sup> Downloadable from this website

## 2 SUSTAINABLE GROWTH

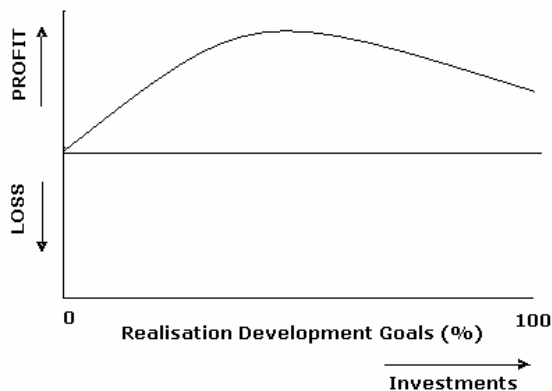


This graph presents long term financial consequences of a typical growth scenario of a service provider. Most service providers make use of infrastructure to produce, transport or provide access to services and public goods. With the implementation of investment projects the service provider achieve the development goals. These goals are ideally specified and formulised in output-based specifications or performance requirements. Note that over time the development goals often changes and expand in scope. The investment projects have financial implications for the service provider.

### Financial implications of investments

It creates additional infrastructure that requires maintenance, it also increases the operating costs and the loan to finance the investment has to be repaid, with interest. On the other hand the investment project may increase the revenues of the service provider, e.g. user charges.

As private enterprises aim to maximise their profit (based on long term projections), they will aim at reaching point A. Because the development objectives of the society and the objectives of the company (making profit) do not correlate, it is likely that unless strict regulations private companies will do invest beyond point A. Public organisations however do not have to make profit and therefore aim at point B. Point B is the optimal realisation of the development objectives that can be sustained. Additional investments will create a loss making organisation that can only survive with subsidies.

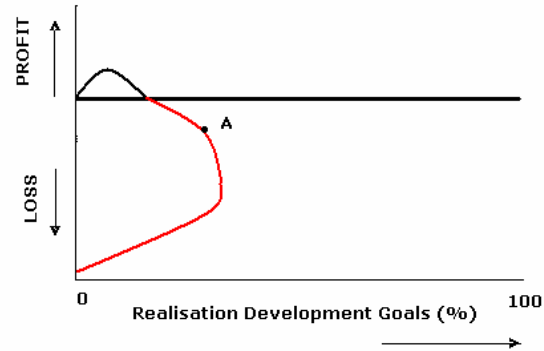


In high-income countries, the service providers are in the lucky situation that they do not have to worry about the financial sustainability of their operations. If the provider is unable to generate enough income, it receives subsidies from the treasury. These service providers plan and invest solely on basis of their contribution towards the development goals and the efficiency of doing so.

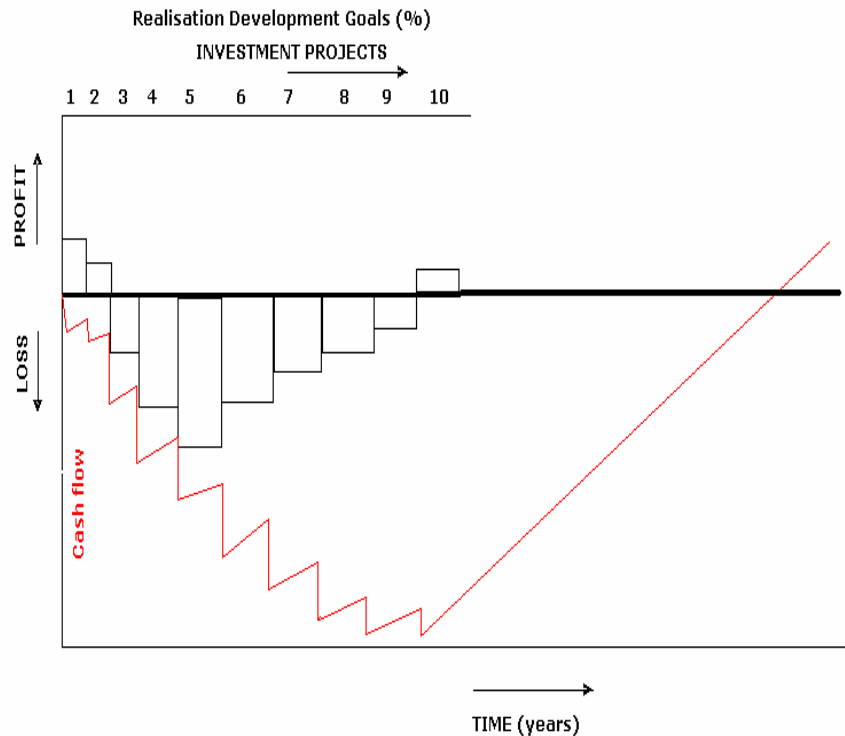
Many service providers in low and middle-income countries operate in the same way as their colleagues in the more fortunate countries.

They plan from a surplus situation. They consider their resources relative scarce, while in fact they are often absolute scarce. When service providers in so-called deficit situations plan without taking into consideration the financial implications of their investments, they run the risk of bankruptcy.

Because the subsidies from the treasury are seldom enough to sustain the operation, as a result maintenance of the infrastructure is neglected and operations are shut down.



Bankruptcies are also caused because of liquidity problems. For example, in the following situation, if the service provider would make all the investments it would be able to achieve all its development goals and even make a small profit. However the growth scenario is very risky as the organisations incur heavy losses and therefore loses its credibility with the financial institutions. After all pay back period may be as long as several years, if not a few decades.



As a result it may not be able to finance the complete plan. It could get stuck in a situation, where it has a lot of assets that require maintenance but cannot generate the income to finance it. Without subsidies from the treasury, the organisation may go bankrupt.

Thus service providers not only have to estimate the optimum achievement with regard to the development goals that remain sustainable but also have to develop a financial sound growth scenario.

**Optimum achievement**

The optimum achievement wrt the development goals depends on the long-term financial implications of the investments. The service providers have to make long-term projections of the costs and

**Revenues**

revenues of the investment.

Assessments of revenues should include the market situation of the service provider, and the ability and willingness to pay for services, but also the demand for services. For example, most road agencies have a monopoly in providing access through the road network. Its revenue is dominantly generated from VAT charges on petrol and oil, and road tolls. Other sources of income are the road tax and taxes on sales of vehicles and road tolls. This means that road agencies need to question if additional investments in the road network will result in additional traffic demand or demand for additional vehicles. Or will they be able increase their income through higher rates of VAT on petrol?

Service providers in the water and sanitation industry do not always have a monopoly. In many low and middle-income countries there are alternative providers and sources of water. These means that they have to compete on basis of quality, availability and price. High-income segments will abandon providers if the quality and availability do not meet their expectations. The low-income segment of the society is often more concerned with the retail prices and will opt for the providers with the lowest costs.

In both industries, the high-income segment of the society is willing to pay more for the services, but does this mean that in absolute terms they are able to generate the highest revenues?

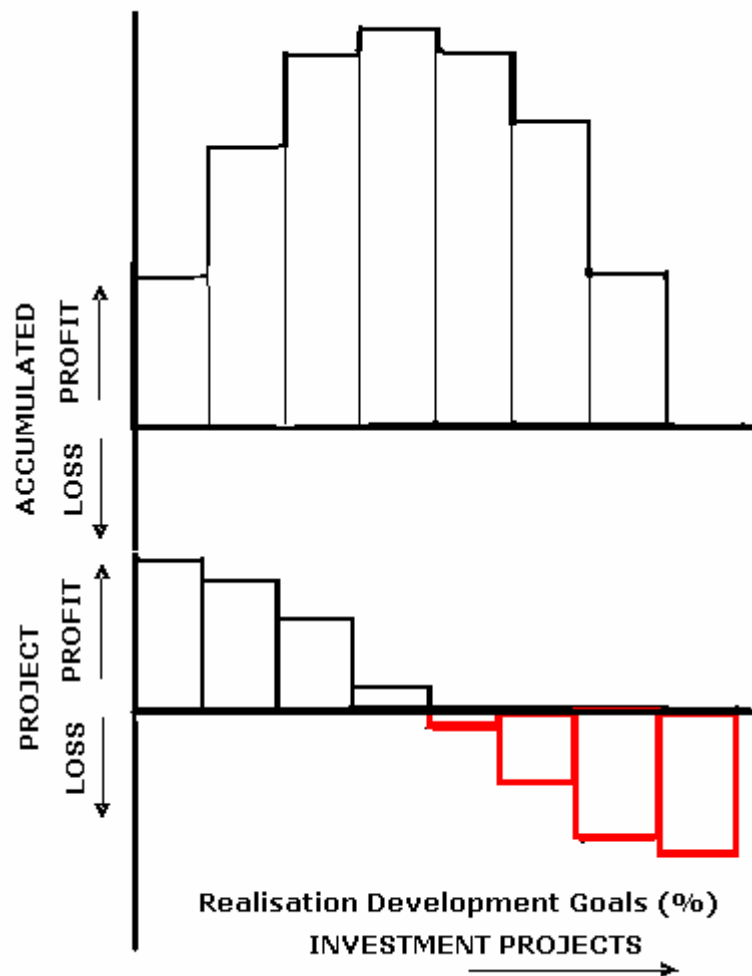
**Costs**

The long term cost projection depend on many factors, as:

- Depreciation of investments cost
- Interest rates
- Maintenance requirement
- Operation requirements
- Administration and other overhead costs

To find the optimum investments, the planners have to develop a growth scenario. The first step is to map current situation in terms of the development goals (service delivery). This mapping includes the physical infrastructure required to provide the service. It is recommendable to limit the development goals to only those issues that can be described in absolute terms and do not apply gradual developments. For example describe the development goals in terms of the number of people served with sufficient quantity and quality of water rather than trying to describe the quantity and quality of the water in gradual terms, e.g.:

- 0-25 litres
- 26-50 litres
- 50-100 litres
- etc.



The second step is mapping the required resources for the ideal situation; when 100% of the development goals are realised. This step includes a sketch design of the physical infrastructure needed in this situation. Many planners are faced with a situation that the development goals are expanding. For example due to the population growth. Planners have to make projections with regard to population growth.

The third step is to prepare various growth scenarios. The possible growth scenarios depend on the considerations like:

- Nature of the development goals
- Nature of technology
- Economics of scale

The development goals influence the physical infrastructure. For example the provision of access requires that additional roads are linked to main network in order to provide access to various destinations.

Technology itself influences the planning. For example generators and satellites have made it possible to provide electricity and telecommunication services in the most remote places on earth. Places that may not even have road access.

Planners however do take into consideration the economics of scale. Instead of (often) expensive stand-alone solutions they prefer to expand their services through connectivity to the electricity grid and other networks.

### **2.1 PRICE DISCRIMINATION**

Many consumers of basic public service in low and middle-income countries are unable or not willing to pay for the services. It is therefore difficult for public service providers to break even or to make the necessary profit. To enable the poor to pay for their consumption of public services, the service providers can link the prices of the public goods or services with the ability to pay. Usually the prices increase with the ability to pay.

The service providers will be able to increase their income through segmenting the service markets on basis of the willingness to pay. The demand for public services is in general more elastic when income is low and becomes almost inelastic as income rises. There are exceptions, like consumption of medicines. Service providers are only able to segment their markets when they sufficient and valid information about the demands.

### **2.2 BULK PURCHASES**

Although bulk purchases do not generate any income, they often result in large discounts. This is definitely the case for service delivery depending on infrastructure networks (roads, water supply, electricity etc.) but is often also the case for other purchases like medicines. Government interference in public service delivery is therefore also required from an financial point of view.

### **3 PUBLIC-PRIVATE PARTNERSHIPS**

#### **Traditional roles of the private sector**

Traditionally the private sector's involvement in infrastructure delivery was limited to inputs in the design and construction process. More recently the private sector is hired to manage the assets and to collect the user charges. In all occasions the public sector operates as a client and pays the private sector for its services.

#### **Leasing of infrastructure**

In certain countries the private sector can lease assets from the government and take the responsibility for operating and maintaining it. The private sector pays the lease to the government and generates its own revenues directly from the costumers. Leasing out of assets is attractive to the public sector because it reduces the uncertainty of income generation, the hazards of controlling expenditures for operation and maintenance and often it receives advances on the revenues. The advances can be used to finance other pressing activities. The lessee indirectly helps the government to reduce the backlog. A lease is often more effective to improve the efficiency of the utility than obtaining management services from the private sector. Under lease arrangements the private sector bears the commercial risks and is therefore more motivated to increase revenues and reduce expenditures.

#### **Private sector participation in financing infrastructure**

However the private sector is also directly involved in financing infrastructure works. Concessions, BOT, BOO and Divestitures all depend on capital investments from the private sector. In all these situations the private sector operates and maintains the assets.

#### **Concessions**

The government remains the owner of the assets when it gives out concessions to the private sector. Concessions are usually rewarded to the bidder, which proposes to operate, maintain and expand the utility against the lowest tariff (read retail price for the costumer). Because concessions may take up to 30 years, it is necessary that the contract not only specifies the arrangements for the current situation but also for adjustments in the future. It is likely that the utility will have to expand. Who will pay for these expansions and what are the arrangements for future price adjustments? Other typical elements in the contract relate to the performance of the private sector in terms of delivery of the goods/services and maintaining the assets. The contract ideally would include arrangements for arbitrating disputes and defaulting clients.

#### **BOT**

Under Build-Operate-Transfer (BOT) arrangements, the private sector builds the utility, operates and maintains it for a number of years, before it transfers the ownership to the government. During the years that the private sector operates the utility, it sells the goods/services to the government or its agencies (public utility company). The government and the private sector usually agree upon the minimum quantity that the government will purchase from the private investor. The financial value of this quantity would cover the construction and operation and maintenance costs during this

period. If the government in the end purchased less than this minimum amount, it is still obliged to pay the full charge.

**BOO**

Build-Own-Operate BOO arrangements are similar to BOT arrangements with exception that under BOO arrangements the private sector keeps the ownership of the utility.

**Divestiture**

A divestiture transfers the ownership of the assets to the private sector. The government is thus no longer concerned about the quality of the assets but only concerned with the delivery of the goods and services to its population.

**Franchising**

Under franchising arrangements, the private sector receives a monopoly to produce and distribute certain goods or services. It generates its income directly from the costumers and has to pay the government for monitoring its performance.

**Attracting private investors**

The private sector is profit orientated and will only participate in infrastructure works when it expects that revenues will exceed the costs. This implies that it wants to reduce uncertainties about costs and incomes of operations. Because of the higher uncertainties in low and middle-income countries, private investors tend to demand shorter payback periods than they would require in high-income countries.

Like any investor it seeks guarantees about future expenditures and incomes. Governments have to feed the private investors with information like audited financial statements about the utilities operations and commercial viability.

**PPP pro-poor?**

In low and middle-income countries it is often more profitable to under-supply goods and services to the poor and overcharge the rich. Slum dwellers or subsistence farmers seldom generate enough revenues to justify projects on commercial basis. The government does not want private sector participation to result in exclusion of the poor. To meet the social equity principles the government has to be cautious while regulating the arrangements between the public and private sector.

Pro-poor delivery often means cross-subsidisation between segments of society and between the infrastructure sectors and often requires finances from general taxation. Ideally all the public-private partnerships together should result in the highest coverage and performance standards possible and at the same time each partnership for offer should be attractive to the private investors. Because PPPs have long lives (up to 30 years plus) it is very difficult for both the government and the investors to make reliable predictions of future clientele, revenues and costs. These difficulties are enforced due to a lack of transparent financial reporting systems and reliable data on revenue collection. Many private enterprises are therefore hesitant to invest in this sector.

The traditional form of infrastructure provision through the

government had the advantage of economics of scale (low marginal cost of production). In addition the monopolistic character allowed the government to cross subsidise infrastructure sectors.

**Planning implications**

The impact of private financing is often that the government rents the assets instead of financing its investments. In a way the investment costs are spread over the life of the assets. The investment expenditures therefore take place during the life of the assets and not during the construction period. It is important that the government forecasts and programs these expenditures carefully to avoid cash flow deficits in the future.

Despite the earlier mentioned concerns many governments prefer private sector involvement. Not only to generate additional investment funds but also to improve the efficiency of the utilities. Many governments have evolved in expensive and far from flexible bureaucracies. It has set higher and more rigid standards for itself than for the private sector. Because of its organisation characteristics it has become unsuitable to deliver the goods and services in a cost-effective and sustainable manner.

However the assumption that the private sector is always more efficient than the public sector is more and more challenged. Furthermore most analyses do not take into account the internal costs for the public sector for regulating and monitoring the private sector's participation.

## **4 FINANCIAL MARKETS**

Financing of infrastructure from (domestic and foreign) private financial markets has been very low in low and middle-income countries. However financial institutions do have sufficient funds available for investments but are not provided the opportunities in the infrastructure sector. Governments can borrow funds directly from investors through bonds or borrow money from the bank. Banks perform delegated monitoring.

During the twentieth century many western European municipalities worked closely with municipal banks. These municipal banks developed long term relationships with the municipalities. They not only provided long-term loans (20 to 30 years), assessed loan requests and helped municipalities to develop cost recovery mechanisms for their investments but they also kept the books or at least helped to structure the accounts of the municipalities. In exchange the municipalities paid usually a little higher interest than elsewhere on the competitive market.

When the borrowing and repayment capacity of municipalities is low, the municipal banks are a very attractive option to obtain credit. Stronger and more experienced municipalities may want to explore competition to reduce the costs of unfavourable repayment conditions.

Unfortunately many local governments in low and middle-income countries have no access to banks with whom they can build up a long term banking relationship. On the one hand these borrowers are considered extremely risky and on the other hand deregulation of the financial sector and public procurement laws have opened the market to other investors. Although alternative investors may work with lower interest rates but they also work with very low repayment periods of 3 to 5 years. It is impossible to generate enough revenues from infrastructure investments within these time frames. The commercial banks often treat these loans similar to real estate loans and demand a collateral, often land or commercial successful infrastructure.

### **Bonds**

Because of matching characteristics with infrastructure, the bond market may be an opportunity for governments and other investors to pursue. Bonds are fixed term debts with fixed rate of interest. Investors that seek long term, stable and reliable revenues are likely to invest in bond debts. Pension and insurance funds are typical investors in this branch. However local governments should be careful, as not all bonds have long repayment periods.

### **Credit rating agencies**

Lenders or investors of bonds usually require a credit rating agency to determine the repayment and borrowing capacity of the potential borrower. The repayment capacity depends on the capacity to mobilise revenues and the borrowing capacity requires a sound financial history.

This means that the borrower opens its financial books and records to the public. A side advantage of this measure that it allows for public scrutiny and may lower the risk of corruption when the press discusses these open books during election periods.

#### **Repayment capacity**

The borrower needs to prove that it will generate the resources to pay back the loan. It requires prove of a regular and secure flow of revenues. The revenue forecasts have to rely on user- charge collection efficiencies. This includes the development of long-term budgeting and accounting structures. Many local governments in low and middle-income countries still operate with annual budgets and accounts. An important financial source for local governments is grants from the national government. There are block grants and project or program specific grants. Most national governments are concerned that local governments use these grants to finance their debt repayments. They therefore issue laws and approval procedures that ensure that the loans are only used for profit earning projects. Loans to finance recurrent deficits are therefore considered unacceptable. Deficits that should be solved through adjustment of revenues and expenditures.

#### **Borrowing capacity**

Lenders assess the borrowing capacity to determine the degree of (financial) risk. To assess the borrowing capacity they require financial statements from the borrower. The financial statements should include the borrowers assets and liabilities (account payable) and have to be audited by an independent and accepted auditor. The auditing process requires a transparent system of financial reporting. In addition the borrower has to provide collateral. The treasury is often concerned that local governments and national line agencies over borrow due to short-term behaviour and feel that they should coordinate and control the aggregate of the loans. Politicians realise that their term in office is only of limited duration and often wish to invest the maximum possible. Without control it is likely that the investments exceed the borrowing and repayment capacity.

#### **Repayment difficulties**

Investors and their delegates (banks and sometimes the treasury) are also concerned about the reputation and performance of the legal system. There are still quite a few borrowers that despite their commercial success are unwilling to appreciate the repayment conditions. Investors and their delegates need to be able to obtain court orders, which enable it to foreclose the borrower's assets, preferably within days whenever the borrower defaults. With the court order in hand the investor or delegate is able to control the delinquent. In particular national governments find it difficult to take sanctions against defaulting departments or local governments.

In some countries local governments are only allowed to borrow from the treasury. The treasury intends to safeguard the debt situation of the country and prevent local financial bankruptcy. At the same time they act like a guarantor for the local governments and national line agencies to resolve private financial sector concerns about local governments' fiscal performance. To do so they have to set up a redemption or sinking fund, which can also be used

to pay the credit rating agencies.

Unfortunately this situation may evolve in an organisation culture among the borrowers that they can default the loan or are not responsible for the commercial failures of their operations. If the borrowers themselves would have to provide the guarantee, they would be more motivated to improve on their financial obligations. Local governments and the line agencies can use their properties like buildings and land as collateral.

**Bookkeeping**

To provide the information to the credit rating agencies, the borrowers need to have updated inventories of their assets. The accounts should clearly distinguish between current and capital expenditures

**Assets**

The total assets correspond to fixed assets, pre-production expenditures and current assets, which need to be accurately valued.

**Fixed assets**

Fixed assets include items like:

- Land
- Buildings and other infrastructure
- Machinery and equipment
- Industrial property rights

**Pre-production expenditures**

Every investment in infrastructure and other project has incurred expenditures before the infrastructure is in operation. These expenditures that will be capitalised, are the so-called pre-production expenditures.

**Current assets**

The current asset is the sum of inventories, marketable securities, prepaid items, accounts receivable and cash.

**Liabilities**

The liabilities contain items like current liabilities, long-term liabilities, equity and reserves.

**Loan assessments of the borrower**

When loans are offered, the borrower has to evaluate them. After all, the borrower (read government) has to pay the price in terms of interest and premium to cover the risk. The lender usually requires a guarantee and the borrower has to evaluate if it is willing and able to provide the collateral. Some loans include grace periods. The period in which the loan does not have to be paid back. The loan agreement will have to include the repayment conditions and arrangements for bankruptcy and defaulting. All these factors have financial consequences for the borrower and the lender. From the borrowers point of view the repayment periods should equal the economic lives of the financed assets, which would lower the cost price of the commodity.

## **5 LAND BASED RESOURCES**

When (local) governments own land they can use it as a resource to generate funds. The most common options are leasing out and selling of the land. Many parcels of government land are unproductive or their income generation is far below their potential. Departments and agencies are usually given land or rent it against heavily reduced rates. They therefore are not motivated to use this land in the most efficient manner. Furthermore governments have located themselves at prime locations, with extreme high land values. A shift to the suburbs may free up considerable amounts of funds for infrastructure provision.

<b>Land tax</b>	In addition the government can issue taxes on land of its inhabitants, like: <ul style="list-style-type: none"> <li>• Urban Land Taxation</li> <li>• Taxation on increment in land value</li> <li>• Vacant land tax</li> </ul>
<b>Urban land taxation</b>	Under urban land taxation, landowners have to pay a tax for its occupation of land. Most government apply progressive tax rates for size and use of the land.
<b>Land value increment tax</b>	Land value increment tax is a method to reduce speculation in land and properties. Speculators may purchase cheap (often agricultural) land and wait for the government to upgrade the land for residential or industrial purposes. They may even wait for the government to connect the parcel to different infrastructure networks prior selling it. This tax is collected when the land is sold.
<b>Vacant land tax</b>	Vacant land tax is used for the same purpose but collected annually. Regardless if these taxes meet their objectives, they do generate income for the government.
<b>Fees and charges</b>	Local governments can raise also various types of fees and charges, e.g.: <ul style="list-style-type: none"> <li>• Building Permission Fee</li> <li>• Stacking Fee</li> <li>• Conversion Charge</li> </ul>
<b>Building permission fee</b>	The building and housing inspection department charges the so-called Building permission fee to anyone who wants to construct, demolish or expand a building.
<b>Stacking fee</b>	The stacking fee is charged when construction materials for private constructions are placed on public land.
<b>Conversion charges</b>	Anyone who wants to upgrade the purpose of land has to seek an alteration of the zoning plan. Usually the government will demand a conversion charge to evaluate this request.

Governments should consider inflation while determining penalties on delayed payments.

#### **Land banking**

The government can also actively involve itself as a real estate agent or in land speculation. It acquires cheap land well in advance. To add value to the land, it changes the zoning plan allowing residential and industrial activities. It even may add more value to the land by constructing the necessary infrastructure before selling it. These government projects usually aim for the upmarket segments of society. The profit can be reinvested in projects with a more pro-poor character.

#### **Private developers**

The government may also collaborate with private developers. The private developers provide the investment capital to provide the infrastructure in the development area and perhaps the houses prior disposing the plots to the market. The government connects the infrastructure to the main infrastructure networks. The developers pay a levy to the government for adjusting the zoning plan and connection to the main infrastructure networks.

#### **Neighbourhood upgrading**

Besides developing new urbanised areas, local governments face the challenge to provide infrastructure to existing neighbourhoods. Upgrading often requires land from parcel owners to provide road or footpath access to the plots and land during construction of the infrastructure. Governments can use land incremental charges to finance a part of the upgrading activities, but then it has to compensate the parcel owners for their contributions.

#### **Land Pooling and Readjustment**

The government may also opt for barter techniques, in particular when it is likely that the benefiting household are unable to pay for the land incremental charges. The landowners are not compensated for their loss in value. All the adjoining parcels are consolidated, developed and partitioned in serviced plots. While partitioning the designer has to minimise the cost for compensating damages to permanent buildings. The idea is that every parcel owner contributes land for the provision of infrastructure. Ideally each parcel owner contributes in a regulated way (see also chapter 5) but often the actual contribution depends on the pattern of existing buildings and the alignments of the infrastructure.

The project may be self-financing when it is possible to generate enough land that can be sold. However this is seldom easy in build up areas. The buildings have to be relocated to increase the building density and free up land. This means that the project has to compensate the building owners who loose their properties. Furthermore many slums have already very high building densities.

#### **Need for cadastre**

Because of the land readjustments, it is necessary to assess the property values and ownerships at pre and post implementation stages of the project. This requires a cadastre with accurate and reliable land titling systems. If such institution does not exist it should be created and maintained.

## **6 COMMUNITY PARTICIPATION**

Profit oriented organisations reject infrastructure and urban development project proposals targeting the poor, even before they are formulated. It is assumed that the poor in slum areas and in rural areas simply cannot pay for the services and goods. After all the private sector evaluates each project individually. However the government has to serve all, not only the rich and wealthy. It also has to take into consideration the negative health and environmental impacts of areas with inadequate infrastructure provisions, not only on that area but also on the rest of the society.

### **Affordable?**

The pro-poor projects will become more commercial viable when they are considered to be part of a larger entity. The larger entity, utility or government may accept loss-making projects on condition that the total expenditures are lower than the incomes of the entity.

In particular in urban areas but also in rural areas, various projects have provided evidence that the poor are able to contribute to the investments. First all the poor are able to provide (unskilled) labour for the construction works against low wages and are often willing to work for subsidised rates. Secondly the poor may own land and are able to provide a piece of the land. And finally the poor may contribute in cash.

### **Moral issues**

There are different views if it is acceptable to request the poor communities to contribute to upgrade the infrastructure provision. Some may argue against it, because not every community member has selected the project or will benefit from its fruits. School-buildings only serve the families with children. Furthermore some communities may have a high turn over of people moving in and out the neighbourhood. Those who argue in favour, state that it can be seen as form of tax payment and when properly organised and not too demanding it could be accepted. Others will argue that such a tax is only acceptable if the community concerned benefits directly from the project and the project meet the specific needs of the community. However the fact that a community has an interest in the created assets does not automatically imply that any individual from the community has to contribute, given that all people have their own personal interests. Care should be taken not to take an unacceptable high share of their income for the projects. Would it be justifiable to request a higher percentage of their incomes than that of the upper and middle class to provide the same services and goods?

Unfortunately many poor communities will remain deprived from infrastructure if they do not generate a part of the resources. A contribution from the community makes the project cheaper and thus more likely to be viable. It also gives the community rights to participate in the design of the plan and its implementation. It is therefore that many low-income communities are willing to

contribute in the investments.

**Land contribution**

Slum dwellers may not be the owner of the land on which they build their houses. They may rent the land or simply occupy the land illegally. In these cases the community is not able to contribute land to the project.

**Land entitlements**

Land ownership is a major concern for slum dwellers. When they rent or illegally occupy the land, they fear problems of rent increases and removal from premises and therefore are hesitant to invest in the project or in upgrading their houses. It is therefore important to provide land entitlements to the slum dwellers.

**Labour contribution**

The community can only contribute labour to projects when they actually can carry out the tasks. Labour-based technology of civil works generates many workdays of unskilled labour. Tasks that easily can be carried out by the community. It is however unfair to ask the community to work for free. Most poor people have little or no savings. Every day that they do not generate income is an assault on their savings or worse increases their debts. The community members should at least receive a pay that will cover their food expenditures. Although reduced, the wages are still an incentive to attract workers. Productivity based payment systems help to motivate the semi-volunteers to progress the works. Another advantage of labour contribution is that it does generate income in the projects area.

**Financial contribution**

Quite a few slum upgrading projects in low and middle-income countries were partly financed with financial resources from the community. It has become one of the key characteristics of the Slum Networking approach. A sociological study of a slum-upgrading project in Ho-Chi-Minh City (Vietnam) indicated that one of the major problems for the population was the heavy debt many had contracted at extremely high interests<sup>2</sup>. It is likely that this situation is not an incident and that more slum dwellers in the world have to deal with this problem. It is therefore also likely that slum dwellers may increase their debts with usurious moneylenders to finance their contribution to the project.

Governments can facilitate mitigating interventions. For example government banks or private owned banks can set up small credit schemes that provide mortgages to the households. The households use the serviced plots as collateral. The height of the mortgage should not exceed the financial capacity of the individual borrower and the value of the serviced plot. The financial capacity of the borrower is linked to its income generation capacity. The bank may also provide mortgages for the construction or improvement of the houses.

Alternatively the banks can develop traditional micro-credit schemes. Where for example a couple of borrowers are grouped together and are jointly responsible for each other's repayments

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<sup>2</sup> Vincent Ogu & Katherine Coit; Financing Infrastructure in Low Income Urban Communities. Published in Financing and Pricing of Urban Infrastructure

(social collateral). However before the banks can and will provide the loans or mortgages, the individual households have to prove that they are able to repay the loan. Because most slum dwellers do not have permanent employment contracts, most banks will require that the slum dwellers first save with the bank to assess the capacity to repay the loan. The saving period varies from country to country and from bank to bank.

The bank develops a relationship with a client and should not be given the responsibility, task or authority to generate the financial contribution for the community. The generation of the community contribution is the responsibility of the community-based organisation (CBO), the government itself, the developer or project.

**Assessing households contribution**

There are different ways to establish the households' financial contribution to the project. The contribution can be generated on a voluntary basis. However there is a possibility that many households will not contribute and that not enough funds will be generated. The main advantage of voluntary contributions is that those who cannot afford to pay will not.

It is also possible to regulate the contribution system, similarly to tax payments. There are different principles and indicators to determine the height of the contribution.

**Equal-sacrifice**

The first principle is that every household contributes equally, irrespective of income, wealth, land and property. Thus every household sacrifices equally.

**Ability to pay**

This method is simple but usually perceived unacceptable because most households have different ability to pay. The ability to pay concept determines the contribution height on basis of the income levels and/or possessions (land and building) of the households. Households with more or less the same income levels and/or possessions pay the same. Those with higher incomes and/or more possessions pay more than those who earn and/or have less.

In theory the ability to pay approach can use two concepts to set the height of the contribution in this type of projects:

1. Equal proportional sacrifice
2. Equal marginal sacrifice

**Equal proportional sacrifice**

Under equal proportional sacrifice arrangements everyone pays the same percentage of their income and/or possession. In slum upgrading projects, the increase in land and/or property values is main financial benefit for the households. This increase is therefore seen as the gross income. Under these arrangements every household contributes the same percentage of their expected gross income.

**Equal marginal sacrifice**

The equal marginal sacrifice is a concept that is applied on income tax. If it is followed everyone has the same net income. The height

of the contribution is set in such a way that net increase in land and/or property value for every household is equal.

The contribution of each individual household can be calculated with the following formula:

$$\text{Contr HH}_x = (\text{Income HH}_x - \text{Income HH}_{\min}) + \text{Contr HH}_{\min}$$

Where:

$\text{HH}_{\min}$ : the household with the lowest increase in land and/or property value

$\text{Income HH}_{\min}$ : Lowest increase in land and/or property value

$\text{Contr HH}_{\min}$ : The financial contribution of the households with the lowest increase in land and/or property value

$\text{Contr HH}_x$ : the contribution the household has to pay

$\text{Income HH}_x$ : the increase in land and/or property value of household x

### **Assessing land and property values**

These methods depend on assessments of the increase in land and property values. Banks, developers and previous projects may give indications about potential increases. The land value depends on criteria like size, provision of infrastructure on the plot, provision of infrastructure in the neighbourhood, location of the neighbourhood, safety in the neighbourhood. The property value often depends on the area, volume of the building, number of levels, building materials and infrastructure provisions.

## **APPENDIX 1: FURTHER READING**

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