
CHAPTER 23

Adaptation and Mitigation: What Financing is Available for Local Government Investments in Developing Countries?

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Summary

This article reviews specific funding available for adaptation and mitigation investments of cities, and discusses the mismatch between needs and financing tools. These funding sources are insufficient, highly fragmented and not really tailored to local governments. They are narrowly sector-based and risk being counter-productive in the urban context. Furthermore, they are complex and costly to access, or else targeted to sovereign borrowers. The article makes proposals to adapt these finance tools, re-introduce local authorities in mechanisms from which they are presently excluded, and create incentives in their favor. Finally, it proposes an initiative for cities in fragile states, based on greater involvement of wealthy Northern cities and the recourse to a specific financing mechanism.

Key Words: Adaptation, Mitigation, Financing, Investments, local governments

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1. INTRODUCTION AND BACKGROUND

The cities eligible for development assistance will be relatively harder hit than others by the direct and indirect impacts of global warming. Across the African continent, the reduction in arable land per capita due to the combined effects of desertification and demographic growth risks triggering unprecedented migratory flows to the cities (Collier et al. 2008). In other parts of the world, such as the Pacific and Indian Ocean regions, rising sea levels and more frequent hurricanes will force people to relocate homes and businesses (Dasgupta et al. 2007). The economic and environmental repercussions of these migrations and displacements, coupled with the inevitable social tensions they bring, will put a strain on local government (African Development Bank 2009).

Unfortunately, these events will affect urban areas already suffering from serious dysfunctions and deficiencies in housing, water and electricity supply, sanitation and drainage, and management and governance. Furthermore, urban economies, particularly large metropolitan areas, with massive levels of energy use (especially for electricity and urban traffic) will ultimately bear the ineluctably increasing cost of fossil fuels as well as the additional cost of alternative energy solutions (IPCC 2007).

Generally speaking, urban governments, which run local public services that emit large quantities of greenhouse gases (waste, transport, etc...) and who are responsible for implementing policies to effectively reduce emissions (standards and incentives for public and residential buildings, urban traffic, urban planning, etc...) will be under greater pressure to carry out mitigation investments (Reid and Satterthwaite 2007).

These countries' local authorities will ultimately have to shoulder a growing share of the responsibilities and of the investment outlays for at least two reasons. First, this is a structural trend, which appears as a corollary of development: local governments carry out a large proportion of public investment in industrialized countries (over 65 percent on average for Europe), but a low proportion in the least developed countries (less than five percent for Africa). Secondly, central government budgets will be required for core government functions (social, justice and security sectors), whose relative costs are rising, in areas where there is a particularly acute need (world food shock, among others) and for national and regional climate change policies and actions.

This observation should have prompted special initiatives to enable local governments to finance mitigation and adaptation investments and actions. Yet the fact of the matter is that this has not happened. On the contrary, current investment financing facilities, which work at national level and/or are difficult to access and unreliable (Anderson and Chandani 2008), have not been designed for local governments at all.

Moreover, instruments strictly intended for climate change investments could rapidly show their limitations in urban areas where there are many, complex sector interdependences (Satterthwaite et al. 2007). More seriously, addressing

climate change separately from environmental issues in general, and urban management in particular, could even prove counterproductive.

Perhaps most importantly, the financing currently available via these specialized instruments appears to cover only a minute proportion of the estimated investment needs. Ordinary local investment financing tools need to be mobilized, and they themselves have limited intervention capacities, just as the local authorities' borrowing capacities are limited. In these circumstances, it is vital to seek leverage by mixing different types of resources from diverse sources and to set up incentive policies to encourage local governments to make this type of investment a top priority.

It is in the least developed countries that the situation of cities could turn out to be particularly dramatic. A large number of these countries are in regions where the effects of global warming will be the most severe (Collier and al. 2008; Toulmin 2009); and the local government sector in these countries is often a sparse affair, with few human and financial resources, little borrowing capacity, and limited or no access to the capital markets. If these cities are to effectively — or at least partially — address mitigation and adaptation, specific assistance and financing arrangements will probably have to be found.

This paper develops this argument in five sections. The first section looks at mitigation and adaptation in a general urban context. The second section presents the different financing tools in place and their investment capacities, and discusses whether cities have the possibility of gaining access to them, directly or indirectly via financial intermediaries. The third section looks at different solutions available for channeling financing through local governments, especially for mitigation/adaptation investments. The fourth section looks into solutions that could create leverage for existing financing, and develop incentives for local authorities to invest in adaptation/mitigation even though they have other legitimate priorities. The fifth and last section explores possible ways of providing specific resources and assistance to the cities most in need, such as those in post-conflict countries and fragile states.

2. A VERTICAL, SECTOR-BASED APPROACH IS NOT SUITED TO URBAN CONCERNS

In practice, mitigation and adaptation/ actions can rarely be taken independently of their surrounding environment. Any investment in urban areas interacts with sectors other than that in which the investment is made, and therefore needs to be part of an integrated approach (this is even the case of the seemingly most straightforward actions, for example, replacing high-energy emitting light bulbs with low-energy light bulbs in street lamps, since it is necessary to develop specific collection systems for the used bulbs.). In most cases, climate change investments

overlap with environmental and urban policy issues, and with the city's economic and social life. This can be seen from the following examples.

2.1 Adaptation

Protecting coastal cities from rising sea levels cannot be addressed without considering drainage and sanitation, as well as soil use. In Algiers, the Bab el Oued flood disaster in 2001 (800 dead) was caused by a downstream malfunctioning drainage channel that due to the rise in the sea level (because of the combined high tide and high winds) no longer drained. Yet upstream, there was an unprecedented volume of water to be drained due to the torrential rainfall, as well as poor maintenance of the drainage system and, most importantly, soil erosion in the city heights caused by uncontrolled deforestation and urbanization. In Lomé, where part of the city centre is at sea level and rainwater has to be drained by lift stations, it is vital to protect the offshore seawall and keep the drainage channels in working order. Yet the lagoon, which serves as a flood control reservoir, and the lift stations cannot keep pace with the increase in water volumes prompted by soil erosion because of the expansion of informal urbanization in the city's heights.

2.2 Mitigation

In the transport sector, exclusive lanes and ways for buses and trams are seen as one of the best means of reducing greenhouse gas emissions. This is surely the case, to the extent that potential negative externalities of such investments – induced alternate traffic patterns, increased urban spacing – are identified and addressed at the same time. And, in a city where the informal sector provides transport services, setting up a formal public transport system means that the entire transportation supply has to be re-considered. At the same time, this system could have negative effects on local finances due to escalating operating costs, and a negative impact on employment if the changes in the informal sector are not carefully managed and assisted.

In the waste disposal sector, methane capture in solid waste landfills is a relatively easy mitigation action (Dessus and Laponche 2008). Yet from the urban manager's point of view, the fact that the landfill can be partially financed by carbon funds is not enough to make it a good investment. The local authority's investment is justified for environmental reasons in the broad sense; and a landfill is only worth the sum total of the parts of the waste disposal sector (collection, intermediate storage and transport). Given that this sector is generally the largest item of operating expenditures, any investment decision could weigh on the local government budget balances for years to come.

In these examples, a strictly technical “climate change” approach to the situation is not sufficient to solve the problem and can even lead to negative indirect effects for a city. For instance, applications for carbon fund financing have been made by solid waste landfill operators who are ostensibly the sole beneficiaries, without any mention of the existence and costs of running the upstream branch that supplies the site. The sector-based approach — and even a sub-sector approach in the present case if one considers that climate change is part of the environmental agenda — and vertical funding are not well suited to projects in urban areas, which, by their very nature, call for a transversal and territorial approach.

3. FINANCING FALLS FAR SHORT OF NEEDS AND IS NOT SUITED TO LOCAL GOVERNMENT

There are two main types of funding: the mechanisms based on market financing (carbon finance, in particular) and the funds that provide subsidies and concessional finance. Table 1: Funding Sources for Mitigation, and Table 2: Funding Sources for Adaptation present a summary and description of these subsidy and concessional funding mechanisms and their respective goals. What is immediately striking is the complexity of the institutional landscape: such fragmentation must surely undermine the effectiveness of the whole. It adds to the opaqueness of a set-up that no one can easily see as coherent, so much so that, in some countries, the donors themselves have decided to set up bodies to group and coordinate the financial flows and actions of these different instruments (Ayers 2009).

The majority of these funds concern intangible actions (studies, training, planning, action plans, research and development, pilot initiatives, etc.). Among these are the National Adaptation Plans of Action (NAPA), which define investment programs for urgent adaptation needs. Yet the financing capacities of these funds are only capable of covering a small fraction of investments needs. And needs estimates are highly approximate. In mitigation, the hypotheses considered for emissions reduction levels and the largest emitters’ efforts set annual investment needs for the developing countries at anywhere between US\$80 billion and US\$500 billion (World Bank, 2008). In adaptation, the different sources and methods estimate needs somewhere between US\$10 billion and US\$90 billion per year (Oxfam 2007).

Carbon finance, notably through the Clean Development Mechanism, is to-date the most important source of mitigation financing for developing countries. The total amount of funding which can be expected is based on various estimates, due to the fact that they are based on hypotheses for future carbon prices. It should be noted that a number of experts consider these

TABLE 1
Funding Sources for Mitigation

Financing Instrument	Managed by	Amount	Nature of Support	Purpose	Beneficiaries – Status – Urban Finance friendly?
UNFCC and Kyoto Protocol Instruments					
Global Environment Facility	GEF	Target: USD \$1 bn. Committed: \$352 mn.	Project	GEF Trust Funds allocated to pilot adaptation activities in developing countries (project support)	Eligible project must generate “global environmental benefits”
Clean Development Mechanism	GEF	USD \$15 - \$25 bn	Project	Carbon emissions reduction (CER) credits market	High transaction costs and high level of knowledge required to justify projects, as well as up-front investment costs
Multilateral Development Bank Instruments					
Clean Technology Fund (CTF)	World Bank	USD \$ 4.3 bn	Project	Promote scaled-up demonstration, deployment & transfer of low-carbon technologies for power sector, transportation, and energy efficiency in buildings, industry & agriculture.	Potential opportunity for urban municipalities to participate in joint exercise to discuss with government, industry, and other stakeholders to develop a country-led investment plan. Mostly targeted at sovereign and private sectors
Strategic Climate Fund (SCF) – Scaling-up renewable energy		USD \$70 mn			
Bilateral Instruments					
Cool Earth Partnership	Japan	USD 8,000 mn		Assistance for improved access to clean energy	
German International Climate Initiative (GICI)	Germany	USD \$40-\$80 mn/year		Sustainable energy projects / Funded by auctioning up to 10% of Germany's allowances from EU ETS (2008-2012)	
Environmental Transformation Fund - International	United Kingdom	USD \$1.6 bn over 3 years from 2008		Support to programs and projects to address climate change	

TABLE 2
Funding Sources for Adaptation

Financing Instrument	Managed by	Amount	Nature of Support	Purpose	Beneficiaries - Status - Urban Finance Aware?
UNFCCC AND KYOTO PROTOCOL INSTRUMENTS					
Strategic Priority on Adaptation – SPA (2003)	GEF	USD \$50 million Allocated for 22 projects	Project	GEF Trust Funds allocated to pilot adaptation activities in developing countries (Project support)	Not clear how/if urban municipalities can access. Eligible project must generate “global environmental benefits” / incremental costs linked with increasing resilience funded by SPA
Special Climate Change Fund (SCCF)	GEF	USD \$90.3 million Total / USD \$67.5 million allocated to 15 projects	Project	Finance adaptation activities related to climate change complementary to those funded by GEF Trust Fund	Not clear how/if urban municipalities can access. Climate change affects core development sector: agriculture-water-health-infrastructure / Finances additional costs of adaptation
Least Developed Countries Fund (LDCF)	GEF	USD \$172 million	Project	Finance preparation & implementation of NAPAs to address urgent/immediate adaptation needs of LDC Parties; 38 NAPAs completed; 24 submitted projects to GEF for approval; 19 approved (as of 21-Oct-08)	Depends on how country involves urban municipalities in preparation of NAPAs. Climate change affecting core development sector: agriculture-water-health-infrastructure / Finances additional costs of adaptation
Adaptation Fund	Adaptation Fund Board / GEF is Secretariat / WB is Trustee	USD \$400-1500 million / of which about USD 91 million available	Programmatic	Funded from 2% levy on transactions under the CDM; to finance adaptation programs/projects in developing countries party to Kyoto Protocol	Countries are beneficiaries / can designate implementation agents, eventually urban munis? Principles: Funding on full adaptation cost basis; short projects development-approval cycles; country-driven projects

TABLE 2, *continued*

MULTILATERAL DEVELOPMENT BANK (MDB) INSTRUMENTS					
Strategic Climate Fund (SCF) : Pilot Program for Climate Resilience (PPCR)	World Bank	Target USD \$1 billion / Available USD \$240 million	Budget / SWAPs / Coordinated investment programs	Grant & concessional finance to 5-10 countries to integrate climate resilience with development planning & poverty reduction strategies and fund investments identified in the plans. Mobilizes new/additional funding	Urban issues not directly addressed but potential of link to urban issues in the planning. Access via MDBs, so via sovereign
Global Facility for Disaster Reduction and Recovery (GFDRR)	World Bank			Technical/financial assistance to mainstream disaster reduction in national development strategies/plans	Urban areas are at high risk, depend on involvement of urban sector in strategy preparation. High risk low & middle income countries
BILATERAL INSTRUMENTS					
Cool Earth Partnership	Japan	USD \$2,000 million		Assistance in adaptation to climate change / improved access to clean energy	
Global Climate Change Alliance (GCCA)	European Commission	USD \$84 million		Draws on EU ETS proceeds to help most climate change vulnerable developing countries (LDCs / SIDS)	
German International Climate Initiative (GICI)	Germany	up to USD \$40 million/year		Support adaptation / Funded by auctioning about 10% of Germany's allowances from EU ETS (2008-2012)	
UNDP-Spain Millennium Development Goals Achievement Fund	UNDP-Spain	USD \$22 million		Interventions to improve environmental management / service delivery at local / national levels; efforts to enhance adaptive capacity	

forecasts to be overestimates, as they take into consideration the volume of carbon market transactions—markets in which the same credit is sold twice, on average, and thus double-counted. For example, the CDM is expected to have provided US\$15 billion to US\$25 billion in direct resources by 2012 and the end of the Kyoto Protocol; these are hypothetical amounts, which will ultimately be compared to the effective payments (United Nations — UNFCCC 2008). The other important imminent source of funding comes in the form of the Climate Investment Funds (CIFs), made up of the Strategic Climate Fund (SCF) and the Clean Technology Fund (CTF). The SCF also targets mainly mitigation, via a forest program and a renewable energy program. A small share of the SCF (US\$ 240 million) is earmarked for pilot adaptation operations. The CTF has an allocation of over US\$4.3 billion and will provide concessional financing for low-carbon investment in the energy and transport sectors, and energy efficiency in building, industry and agriculture (World Bank 2008).

Carbon finance provides, in principle, financing which is additional to traditional Official Development Assistance (ODA) (Oxfam 2008). However, in practice, it appears that the subsidy provided by CDM is, in part, pushing aside traditional ODA and leads, therefore, to a substitution effect rather than an additional effect. Furthermore, a review of approved CDM operations indicates a strong geographical concentration on a small group of countries (China, India, Brazil), as well as sectoral concentration (almost half of financial volumes are related to hydrofluorocarbon gas from the chemical industry) (Pfeifer and Stiles, 2008, World Bank, 2006). This reveals methodological problems (only effectively measurable emissions reductions are financed), which are at the present time difficult to avoid, and can be considered a result of the vertical nature of this financing mechanism.

Adaptation funding is set to benefit from the gradual operationalization of the *Adaptation Fund*, created in late 2007 and due to be financed by a two percent tax on CDM transactions. This fund could free up between US\$400 million and US\$1.5 billion by 2012, depending on carbon prices.

It is hard to estimate what share of these investments the private sector might pick up. Yet no matter what, investment needs are expressed in billions whereas the unit of account for each of these funds is in the tens of millions, or at best hundreds of millions. That gives an idea of the extent of the funding shortfall.

In addition to this lack of financing, local authorities also face a problem with the characteristics and even accessibility of the available financing.

On the one hand, a market mechanism like the CDM theoretically lends itself well to local urban financing under the management of a local authority or one of its divisions — such as a local utility — or a private partner in the case of a service concession. Urban projects which receive the most benefit from this type of financing include essentially the waste sector, public street lighting and transport.

At present, however, public transport projects are difficult to fund with carbon finance mechanisms due to the methodological issues for the measurement of emissions reductions, as mentioned above. Carbon finance provides additional funding that could prove decisive to include an investment in a city's program that might otherwise have been excluded.

From the perspective of local governments, effective recourse to CDM is stymied by a certain number of constraints and limitations. Firstly, the uncertainties currently surrounding the market's continuity after 2012 are hardly likely to set investors' minds at rest, even if some funds are committed to purchase contracts beyond this date (Figueres and Newcombe 2007). Then there is the fact that this instrument is complicated to use, demands know-how beyond that of most people, and calls for sophisticated appraisals that can prove extremely expensive when compared with the resources obtained. These resources moreover have the disadvantage of being quite uncertain, given the volatility of the market and the time it takes to register the project and then establish the volumes the project will earn in reality; it is essential to not draw up a financing plan on the basis of over-optimistic assumptions. Last but not least, even if carbon finance provides revenues *ex post*, it has difficulty addressing the question of initial financing. Some funds can make advances of up to 20 or 25 percent of the amount of a purchase contract, but this requires a guarantee. The future revenues of an *Emission Reduction Purchase Agreement* (ERPA) can theoretically be backed by up-front financing, but such a structure obviously adds cost and increases the complexity of the operation.

The indirect effect of these constraints and uncertainties is to make carbon finance a tool better suited to large-scale projects, for which appraisal costs can be recouped, in a sector for which a simple and reasonably precise measurement approach exists and, for which financing is available.

For example, we can cite the project for the controlled landfill for Greater Amman, which simultaneously obtained a World Bank loan and an ERPA. The World Bank loan is for USD \$18 million to the municipality, but with State guarantee. The ERPA of the Carbon Fund for Europe amounts to 900,000 tons of CO₂-equivalent from now through the end of 2014. Captured methane will be used for electricity generation. We know that the profitability of these projects will be improved a posteriori by the revenues, but in varying proportions that are problematic to determine precisely in advance: many parameters come into play such as the volume of waste, its composition and the climate. There is a floor below which projects do not provide a sufficient return to be eligible for carbon finance. For large projects, the additional revenues can account for 15 to 50 percent of the investment (and up to 75-80 percent in the case where revenues can be earned from sales of generated electricity and if it can be sold at high prices). A city seeking to finance several projects has to wade

through the same appraisal and registration procedure for each project, with the same uncertainties every time.

The day the uncertainties about the future of carbon finance are lifted, the mechanisms that currently govern its implementation will have to be revised. It would be wise for carbon finance to move towards holistic urban approaches: i.e. to finance programs of operations based on overall performance. To meet this objective, methodologies to consolidate/improve emissions reductions measurements in the sectors of waste, energy and transport are currently being developed. Furthermore, it is likely that if the donors set up simple and inexpensive up-front financing arrangements on the strength of pledges based on future revenues from purchase contracts (eventually incorporating a guarantee to cover possible revenue fluctuations, within agreed upper and lower limits), this could have a significant mobilizing effect.

On the other hand, a tool such as the CTF has a precise global instrumental purpose: to reduce greenhouse gas emissions. It has huge sums of financing to allocate, and consequently disbursement challenges to meet. Yet the CTF takes a wholesale approach: the targeted investments are large (electricity generation, for example) and the recipients are explicitly central government, that is, “sovereign” borrowers. These borrowers could admittedly onlend these loans to local governments, but the existence of a threshold for fund eligibility (given as an investment amount) makes this prospect unlikely. For example, if the CTF looks into the possibility of financing investments in public transport for a local authority, it would only be with central government’s approval, under its guarantee and within a national program concerning a number of sites (World Bank 2008).

Local urban authorities are clearly absent from the CTF’s operational strategies. This could be due to the nature and volume of the investments targeted, but it is also most likely due to the more prosaic reason that most of the multilateral donors can only lend to central governments or with the central government’s guarantee (termed “sovereign” loans). Although initiatives have recently been taken to enable these donors to work with what is known as the sub-sovereign market, these commitment volumes are still relatively low (for example in the World Bank-IFC Subnational Program portfolio). There is still a reluctance from most of the multilaterals to deal directly with these borrowers. It is significant that local government is absent from the CTF’s stakeholders, given that these stakeholders cover a good dozen types of players: private sector bodies, scientific and technical experts, civil society representatives, indigenous peoples’ representatives, etc.

4. CHANNELING FINANCING TO LOCAL URBAN AUTHORITIES

There are two main cases: countries with financial intermediation tools for local government, and those without.

4.1 *Where a National Intermediation Tool Exists*

A financial intermediation agent (municipal development fund type) can act as a wholesaler to obtain foreign financing for a group of municipalities from the CTF or other sources (with a central government guarantee, if necessary). This technique of grouping together borrowers is also used to give small and medium-sized local authorities access to good financing conditions on the capital markets. In countries where financing can be found on the markets, this gives them the opportunity to secure financing in local currency. Once the financing is secured, the intermediary redistributes it on a retail basis in keeping with the disbursement needs for the cities' respective projects (and consequently also plays a cash flow role).

The intermediation agent can also play a simple supporting role in implementation. Such is the role, for example, of Morocco's municipal fund, the *Fonds d'Equipement Communal* (FEC) in the loan that the World Bank granted to the central government for a national solid waste program. Under this program, the government has tasked the FEC with helping the municipalities and operators to put together program dossiers and negotiate them with the CDM. The additional resources obtained from carbon finance would be shared between the local authorities and the operators. Under the agreed arrangements, the operators finance the investments and pass these costs on in the form of fees. The local authorities should be able to use carbon finance to reduce the impact of these fees on their operating budgets, although the bulk of these budgets remain covered by central government allocations.

4.2 *Where No National Intermediation Tool Exists*

Some large cities in emerging countries have set up local investment funds to access loans or the capital markets. In the People's Republic of China, for example, where the local authorities are not authorized to borrow, the government arranged for special bodies to be created in the late 1990s. The local authorities own *Urban Development and Investment Corporations* (UDIC), in which they hold assets and liabilities. UDICs are used to finance infrastructure projects, mainly by means of bank loans, public-private partnerships (such as concessions and build, operate, transfer [BOT] arrangements), as well as property development (e.g. building

leases, etc...). They delegate the developer for new investments and supervise the management of existing investments.

Vietnam has set up similar bodies in the form of local development investment funds (LDIF), the largest of which to date is the *Ho Chi Minh City Investment Fund* (HIFU). The main difference between these funds and the Chinese model is that they are financial institutions whose role is to collect medium- and long-term resources, take direct holdings in projects, and take shares in construction and civil engineering companies. These funds can issue bonds, provided they are authorized to do so by the local authority.

These two types of local institutions are examples of structures that can receive funds from the CTF or other sources (and possibly hybridize them, see following section) and implement the adaptation and mitigation investments at a rational territorial level (World Bank 2008).

In small countries where there is no reason to set up such local and national bodies, funds for local government investments can be transited through the retail banks. It is widespread practice for donors to grant credit lines to banks and to distribute retail subsidized financing to private-sector companies to meet environmental standards. The same principle could well be applied to local authorities. Cities in Cape Verde, for example, have access to financing for their investments from the retail banks, which are refinanced by a donor (in this case the French Development Agency). A project assistance and preparation unit has been set up by the national association of municipalities (*Associação Nacional dos Municípios Cabo-verdiano*) to manage and stabilize the system.

5. HOW TO CREATE LEVERAGE AND INCENTIVES FOR LOCAL GOVERNMENT

Finding sources of leverage is vital given the huge gap between adaptation and mitigation investment needs and currently available funding capacities. As we have seen, in the urban environment, it is difficult in practice to distinguish between climate change investment and pure development investment. One way of facilitating the implementation of dovetailed strategies would be to effectively consolidate these two sources of financing.

Yet in addition to the availability of financing, the question of incentives is also crucial to the least developed countries' cities. These cities are confronted with both a surfeit of needs, some of which are vital, and a shortage if not a complete lack of resources for investment (Reid and Satterthwaite 2007). For these cities, the cost of not taking mitigation action is zero and investment in adaptation is second or third on the list of priorities.

Incentives can come from the governments, mainly in the form of additional

allocations from the central government budget for investments to meet a given mitigation or adaptation goal. Incentives can also take the form of tax provisions, interest rate subsidies and even the transformation of loans into grants, contingent upon achieving predetermined goals, obviously provided that the funds for such mechanisms are made secure in the aid systems.

Examples of the different leverage and incentive techniques and measures are the hybrid loan, credit enhancement, the buydown loan, whose characteristics change depending on output, and obviously the various tax incentives for the private sector as either investor or operator.

The *hybrid loan* is the result of a subsidy injected into a financial product (if this product is already subsidized, the new contribution acts like an increase in the grant element) to reduce its rate or change its characteristics (length and/or grace period) to adjust it to the nature of the investment. The hybridization can be perpetuated by the creation of a *revolving fund* (a model that can combine tax incentive provisions). Such a mechanism could be used for local authorities, but also private operators. For example, the United States introduced this model in the 1980s, using subsidies granted by the federal Environmental Protection Agency. Different states set up *State Revolving Funds*, within which these subsidies are hybridized with market resources to create subsidized loans for authorities undertaking a certain type of investment. The reimbursements of these loans replenish the fund, which is also regularly topped up by federal subsidies. The system has since been extended to the drinking water sector, involving private-sector players. Revolving funds have been used for larger scale leverage operations, for example by setting up guarantee funds to improve the retail banks' financing conditions.

Some projects in the transport sector use similar set-ups, such as the Dakar "cars rapides" bus project and the Cotonou motorcycle taxis project (projects financed respectively by the World Bank and the French Development Agency). The idea is to foster the renewal of the stock of passenger vehicles by encouraging (private) owners to buy new, cleaner vehicles that emit less greenhouse gases. These projects use a fund designed to subsidize the scrapping of obsolete vehicles and a bonus paid to buy a clean car. They are underpinned by microcredit and mesocredit establishments that can lend to operators, possibly grouped into cooperatives to stand surety. These operations benefit from tax measures applied to the private sector, whether central government measures (reduced VAT or customs duties on certain types of vehicles) or measures implemented by the local authorities themselves (total or partial exemption from operating fees for a certain length of time, for example).

The *buydown* is a hybrid loan model that incorporates the principles of output-based aid, whereby the loan interest is reduced or cancelled and the loan can be totally or partially transformed into a grant on the basis of actual project or program achievement of measurable targets set in advance. If performance is below par, the

loan is not adjusted. Such a mechanism is ideal for a very soft loan with a grace period. The grace period means that output can be assessed before the loan enters the capital reimbursement phase. This type of financial product plays both an incentive and empowerment role. What comes into play is not the availability of the financing, but the price beneficiaries will ultimately pay for it, and, consequently, their capacity to launch further operations with the same budget constraints.

Credit enhancement: donors or specialized institutions provide partial guarantees destined to meet specific objectives for loans provided or bonds issued by financial operators. The guarantee improves the operator's rating and enables him to access resources at better conditions, which he in turn passes on to the borrowers. This solution is used for local authorities that undertake a certain type of operation and for microcredit institutions, which increasingly use the capital markets for their financing. Examples are the lines of credit designed to provide attractive rates for households and small businesses in the informal sector to finance the purchase of solar panels, energy-saving equipment, etc.

These types of incentives therefore call for special financing arrangements upstream of and/or alongside existing funds. In some of the least developed countries, donors have set up decentralization support instruments. These are funds (such as the Agence Nationale d'Investissement des Collectivités Territoriales in Mali, or the Commune/Sangkat Fund in Cambodia) that supplement the central government allocations to the municipalities with subsidies, and are generally the receptacle for the budgetary aid put in place by donor pooling. They finance operating expenditure in certain sectors (especially the social sector) and investment expenditure. These systems could be used to set up incentive instruments, but they focus mainly on small urban authorities and local rural authorities, and their impact on investment is limited insofar as they generally do not have the possibility to lend.

Intermediation tools such as national development funds and special local entities modeled on the UDICs or the HIFU/LDIFs lend themselves well to leverage and/or incentive arrangements of the buy-down type. Such structures are able to both provide advice to the local authorities — which remains a priority goal given the limited absorption capacities — and put together packages featuring this type of financial product.

To increase these intermediation tools' financial resources, their financing would have to be diversified and linked or even mixed using various mechanisms. The development funds are traditionally funded by central government budgets and also by the donors, in the form of concessional loans (generally in foreign currency) or subsidies, depending on the case. Yet, as we have seen, some of these funds have started to finance themselves directly on the financial markets and in local currency.

One of the objectives of these structures, depending on the size and depth of the market in which they operate, should be to position themselves as a credible alternative to national and regional institutional investors, and even sovereign

funds, and to attract local savings. Another of their objectives should be to capture the potential new generation resources whose appearance has drastically changed the international aid architecture: carbon finance, obviously, but also remittances (which represent more than international aid in volume terms for some countries) and grants from major foundations (some of which now post much greater intervention capacities than many bilateral agencies). The foundations may be more inclined than the cooperation agencies to make use of the leverage inherent in the above-reviewed incentive models, provided investments are targeted in their areas of intervention and funding traceability is guaranteed.

Upstream, at the level of international aid mechanisms, the search for new resources to fill the current shortfall in financing capacity for climate change investments has become a priority issue. A certain number of proposals have been made by different countries and institutions in order to meet this need. These proposals are not covered here, since they are beyond the scope of this article (for an overview of these proposals, see Müller 2008). The following section looks at a type of initiative that could facilitate priority investments in cities in the least developed countries, post-conflict countries and fragile states.

6. TOWARDS A SPECIAL INITIATIVE FOR CITIES IN FRAGILE STATES OR “TRAPPED CITIES”

Cities in post-conflict countries and fragile states amass handicaps. Their basic investment needs are huge, their implementation capacities are low, and solvency and access to borrowing are minimal or nonexistent. Management and governance problems aggravate their lack of appeal to private investors, and, to a certain extent, donors as well. Moreover, donors, like the states, face pressing needs in areas such as healthcare and food security. So many cities, mainly in Africa, see their economic, financial, social and environmental situation deteriorate from year to year (this, it must be said, in a climate of widespread indifference). They spiral downwards in all areas, sucked into poverty traps —hence the term “trapped cities” — from which it is virtually impossible to escape without outside help (Paulais 2006).

This help does not necessarily imply massive investment sums to begin with, since absorption capacities are relatively low. Yet setting recovery in motion does call for emergency programs in infrastructures and basic services. This means that resources have to be available, not necessarily to finance these programs directly, but to facilitate their implementation. It also means securing a long-term undertaking from committed foreign partners to give the management authorities the wherewithal to gradually develop their capabilities.

Urban sector assistance has not developed many financial engineering or

policy innovations in recent years. The healthcare sector has seen the appearance of a new tool, the GAVI Alliance, whose financing is underpinned mainly by borrowing on the markets on the basis of advance pledges from donors. This means that urgent actions way beyond current financing capacities can be taken (HM Treasury-DFID 2003). The GAVI Alliance is a public-private partnership specialized in vaccination campaigns. Its members are made up of donor states, vaccine industry firms, research institutes, UN agencies, international donors and the Gates Foundation (which donated the initial grant). One of the Alliance bodies, the International Finance Facility for Immunization (IFFIm), raises funds for the programs by issuing bonds on the capital markets. These bonds are guaranteed by binding 10-year to 20-year commitments by the donor states. Consequently, they are given a AAA rating by the rating agencies. The Alliance's funds, including funds collected on the markets, are passed on as subsidies to the recipient countries, but these countries must co-finance the programs that concern them. The GAVI Alliance is an innovation in the international aid landscape: an eclectic partnership that has created a simple mechanism, financed by leverage on the capital markets.

This set-up takes advantage of rallying power of the vaccination cause on the international scene. Although mitigation/adaptation for poor cities is probably less gratifying in terms of image, the possibility of creating a similar initiative for trapped cities is worth discussing.

This initiative would be a public-private partnership setup with market service firms (groups working in water, electricity, solid waste and the environment, transport, etc.), donors, regional development banks, major foundations (some of which are already involved in the urban sector, such as the Gates Foundation), sovereign states and rich Northern cities (individually or through their associations). The African continent's sovereign funds might be interested in joining this initiative, which, after all, concerns primarily the African economies and their productivity. Given that these funds - Nigeria, Botswana, Libya, Algeria, Sao-Tomé and Principe, Sudan- represent a cumulative capital of some US\$120 billion (African Development Bank 2009), the allocation of just a fraction of their annual earnings would already be significant.

The role of the Northern cities in this partnership would concern institution building, where they have a legitimate part to play, in keeping with multiannual commitments. Yet there is the question of their involvement beyond this type of action: given that the wealth of large cities in the North is comparable with, if not greater than, many sovereign states (the metropolitan areas of Paris and London each account for a GDP amount much greater than those of Belgium or of Sweden, for example), there is good reason to ask whether their solidarity is not financially undersized. These cities have the economic clout and credit quality to mobilize funds, namely by making commitments against guarantees

and with ad-hoc revenues from paid services (for example, a recent law in France authorizes local authorities to add surcharges to water rates to finance international solidarity projects in the same water sector; another law authorizes them to sign multi-year cooperation agreements with Southern cities). In addition, the weakness of the institutionalized relations between these associations of cities, donors and major foundations suggests that many opportunities remain to be explored.

The idea of this initiative would *not* be to pass on all of its funds to the recipient cities in the form of subsidies. This approach would deplete investment resources prematurely. The initiative itself should seek leverage at the local level using the above-described mechanisms, with one of its goals being precisely to promote systems in which strengthened local authorities manage to secure local resources for themselves.

The global financial crisis has affected the investment sector as a whole, and a large number of PPP projects in developing countries have been cancelled or postponed (Harris and Pratan 2009; Leigland and Russell 2009). An initiative to help trapped cities with a partnership that collects part of its resources on the markets and from private partners or local authorities in the North, when they themselves have suffered drops in revenues, might be met with a certain amount of skepticism. However, we would point out that the World Bank's first issue of Green Bonds on the Swedish market in 2009 aroused a great deal of interest and raised US\$350 million. A second issue in Japan was also a clear-cut success. With the crisis raging, investors have shown interest in AAA-rated products, which meet ethical and environmental concerns about climate change. This gives a glimpse of a potential future with new forms of partnership such as the partnership mentioned for the poorest cities. The financing of mitigation/adaptation investments of trapped cities could become a rallying point.

In the end, this proposal to launch an initiative to support cities in post-conflict and fragile states, leads us back to a general conclusion: the access of local governments to available financing is limited by both the complexity and the fragmentation of these mechanisms. Furthermore, the increasing role of cities in the implementation of urban investments is still largely underrated by the international development and scientific communities. Compounded by the lack of specific urban financing mechanisms, there is considerable risk that the effectiveness of mitigation and adaptation measures in cities will be significantly compromised.

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