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ABSTRACT.— **The provision of basic services in African cities does not rely solely on centralized, integrated, networked infrastructures, it can also involve "alternative" socio-technical systems. Examining the conditions of urbanization in Africa, this article proposes an analytical framework for understanding the spread of delivery configurations consisting of heterogeneous socio-technical subsystems, and suggests that these patterns could better inform new policies.**

AFRICAN URBANIZATION, MODEL, NETWORK, SERVICE

RÉSUMÉ.— **Services en réseaux et villes africaines : l'universalité par d'autres voies ?.— La fourniture de services essentiels se heurte, dans les villes africaines, aux difficultés de l'universalisation du réseau centralisé et intégré et prend souvent la forme de dispositifs socio-techniques « alternatifs ». En revenant sur les conditions de l'urbanisation en Afrique, l'article propose un cadre analytique général pour comprendre le déploiement de configurations de fourniture constituées de sous-systèmes socio-techniques hétérogènes, et des pistes de réflexion pour une action publique renouvelée.**

MODÈLE, RÉSEAU, SERVICE, VILLE AFRICAINE

Providing basic technical services (drinking water, access to energy, management of solid and liquid waste, storm water drainage, telecommunications...) in African cities is often hampered by the lack of universalized networks. Available data is clear: at the current rate of population growth and investment, sub-Saharan Africa will achieve the Millennium Development Goals for drinking water only in 2040 and for sanitation in 2076. Coverage of these services are shrinking in certain countries (Watkins, 2006). The quality of other services, notably electricity, is deteriorating, as proven by widespread outages. The majority of proposed solutions have simply transposed supply systems designed for cities in industrialized countries. These systems rely on a conventional network model, a set of interconnected infrastructures, centrally planned and managed by a single operator, providing seamless service in a given area, which is thus consolidated (Maria, 2007; Coutard, 2010). Transferred to sub-Saharan Africa in a colonial context, this model has since been exposed to major doctrinal changes from the North. Since the 1990s, the dominant forms of centralized management have been progressively challenged by neoliberal reforms, which have been applied everywhere, more or less consistently (corporatization of public agencies, private management of networks, new legislation, and commodification of services). In terms of universal service networks, these reforms have failed. However, by transforming the framework and facilitating the recognition of alternative offers, they have diversified the conditions of access to essential services, especially for the urban poor (Jaglin, 2005). It is therefore striking that all African cities, large and small, are home to a

multiplicity of socio-technical systems of service, concerned actors, and institutional structures, all of whom lead to a diversification of service offerings. Among them, many belong to the informal sector.

Until recently, planning and efforts have focused on expanding conventional service and reducing alternative bids; but are networks intended for ubiquitous universality? African cities are the illustration of a different, composite model; one in which the network has coexisted over the long term and in a sustainable manner with non-conventional extensions of its own socio-technical system and non-network service features (Jaglin, 2010). This article will explain why urbanization processes and those of networked services, far from incorporating alternative decentralized systems, have produced structurally differentiated delivery systems. By looking back on urbanization conditions in Africa and those of the deployment of basic services through "delivery configurations" (Olivier de Sardan *et al.*, 2010) consisting of heterogeneous socio-technical sub-systems, we will attempt to provide a general analytical framework for this disjuncture.

This analysis uses an existing assessment of the limited capacity of endogenous factors to fully explain the changes and transformations of networks over the long term, and therefore the need to link them with their "spatial context" in an analysis focused on "interdependencies between a network and its environment, in particular the territorial system it serves"[1] (Offner, 1993). In doing so, it also examines the hypothesis of techno-institutional convergence in favor of a conventional system, which has until now dominated supply policies in developing cities (Maria, 2007).

Multiple supply configurations

To provide essential services to the entire population, representations, knowledge, and techniques forged in industrialized cities, remain dominated by the image of the network as the most efficient manner to provide urban services to agglomerated groups of populations and activities (Coutard, 2010). Despite the strength of this model, it is necessary to contextualize its practical significance because there are many exceptions in the contemporary urban world, especially in developing countries. We can roughly define four configurations or states for this model: consolidated, deteriorated, unfinished, unadapted (fig. 1).

In this article, we are interested in African contexts, generally situated at the graph's bottom right quadrant. This is where the network share is weakest and equipment policies struggle most to keep pace with urbanization. It is also in this quadrant that access rate improvement, to water for example, depends the most on non-residential supply sources. In the bottom left quadrant, more desirable in terms of network coverage, certain pockets of resistance to universalization still persist in cities but these emerging countries with strong economic growth, as opposed to the least developed countries, have solid states and a certain financial flexibility that allow them ambitious infrastructure and social policies.[2]

1. "[...] interdépendances entre un réseau et son environnement, en particulier le système territorial qu'il dessert."

2. This has been proven to be effective in Chile and more recently in China. Public will has also transformed cities in Tunisia, Morocco, South Africa, and Brazil.

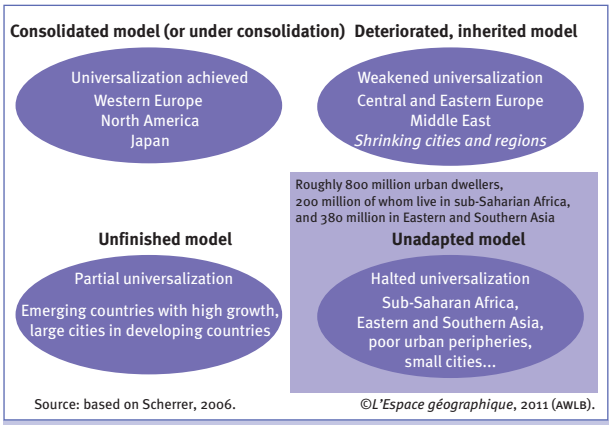

Fig. 1/ Differentiated trajectories for the model of networked urban services

In African cities, service supply is often a combination of deficient infrastructure network – the root of limited offers – and profit-driven offers created by private, individual, or collective entities. These entities can be formal or informal; but are generally illegal in terms of the exclusivity contract of operators officially in charge of the service. These offers make up for the deficiency of conventional service and, depending on the type of urban area, they target either affluent or poor client bases, excluded due to low purchasing power, geographical remoteness, or illegal status. Inspired by one of Jean-Pierre Olivier de Sardan's definition, we define these provider configurations as "combinations of actors, institutions and resources that allow a good to be delivered [...] regardless of the forms of this co-delivrance: collaboration (directly or indirectly, temporarily or permanently), substitution, competition, complementarity, etc."[3] (Olivier de Sardan *et al.*, 2010, p. 5-6). A few examples will illustrate these supply configurations.

Casablanca, electrifying shantytowns

LYDEC, a private company, has been providing water, sanitation and electricity services to the Grand Casablanca region since 1997. Out of a population of 4.5 million people, about 400,000 live in nearly 400 shantytowns. To electrify these shantytowns, where energy poaching is rampant, LYDEC had to innovate. The principle adopted is community-based with LYDEC providing services to blocks of homes. A community representative oversees this «secondary network", downstream from the communal meter, which includes 20 homes within each block. He coordinates the construction and maintenance of works; as well as the metering and payment for the entire block, based on individual meters.

Municipal authorities and the population are free to choose the community representative. Many of these representatives are in fact former electricity poachers, who had acquired experience and control over the illegally connected population. They now receive training and their pay is established in accordance with inhabitants and the amount of work required, limited to 20% of the bill owed to LYDEC (Zaki, 2010).

Mini water systems and small private operators

In Maputo (Mozambique), conventional water utility is managed by AdeM, a private operator, and excludes approximately a quarter of the population, who turn to small-scale private water providers (SSPWPs) for their supply. Operator-owners of water-pumping devices (boreholes with submersible pumps and storage tanks) provide water to neighborhoods using mini-grids that supply standpipes and "spaghetti" household connections, with individual meters and above-ground polyethylene pipes connected to a faucet. Maputo's sectoral water policy[4] aims to offer small-scale private providers the means to play a greater role in urban water service in partnership with the public Water Supply Investments and Assets Fund (FIPAG). It plans to formalize licenses, create legal frameworks for financial partnerships, offer training and professionalization programs, organize a water market through the concentration and integration of the sector (Blanc *et al.*, 2009).

3. "combinaisons d'acteurs, d'institutions et de moyens qui permettent à un bien d'être livré [...] quelles que soient les formes de cette codélivrance : collaboration (directe ou indirecte, ponctuelle ou permanente), substitution, concurrence, complémentarité; etc."

4. Specifically the component no. 3 of the Maputo Water Supply Project, financed by European, French, and Dutch funds.

Access to off-grid power in Tanzania

Access to energy in the outlying villages of the Dar es Salaam region is provided by EGG-Energy[5], a private company offering three services: subscription rentals of rechargeable batteries; the sale of compatible equipment (low energy light bulbs, mobile phone chargers, radio adapters, etc.); the installation and maintenance of household electrical systems.

In 2010, their Change & Swap stations provided 300 subscribers, not connected to the national grid (90% of the population), the possibility of using the electrical energy produced by the Tanzania Electric Supply Company Limited (TANESCO).[6] Demand is high. Customers are subscribing in ever greater numbers, certain are requesting more powerful batteries for televisions, and for those that are far from the EGG stations, a "delivery" system is being tested.[7]

These configurations all have a common feature: the conventional network fails to reach the end user. It needs social and technical intercession in the form of a suitable extension of the network or a non-network system to expand certain features of its service. For example, energy service providers can take on configurations that combine, as shown in figure 2, a network with individual connections and meters, connections downstream from meters (informal system of semi-wholesale subscribers), connections within the network (poaching), off-grid systems (mini-grids powered by solar panels or wind turbines; individual solar thermal plants and solar PV systems) and features accessible to non-connected households: battery rental, mobile phone recharge, group TV sessions…

5. EGG-Energy is a start-up specialized in access to energy, based in Tanzania since 2009. Founded by a group of engineers from Harvard and MIT, it has developed an innovative energy access model for poor households and small businesses.

6. TANESCO is a national, para-public company, whose only shareholder is the Tanzanian government. It produces, transmits, distributes, and sells electricity throughout the country (except on the islands).

7. http://egg-energy.com/what-we-do/

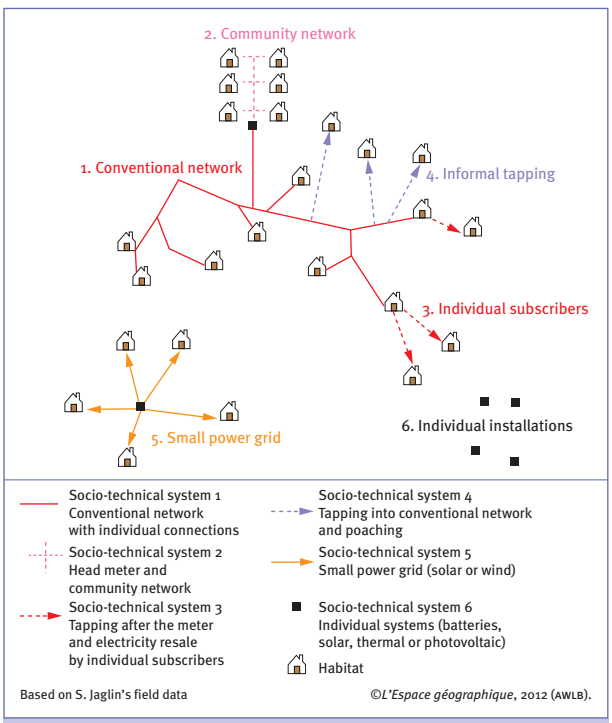

Fig. 2/ Household access to energy: an example of a supply configuration

As for communications, the use of mobile telephony has spread throughout Africa into all categories of the population, opening up to all population groups, including those on low incomes. For them, retail and second-hand economies have developed, often as collective services (Chéneau-Loquay, 2010 and her article in this issue of *L'Espace géographique*).

These systems are not infinite in number and variety. They do not all exist everywhere, nor with the same intensity. However, in every city, there exists a combination of several systems that contribute to providing services, depending on the state of the network and its operations, the nature of urbanization, household purchasing power, and the main provider's will and capacity for innovation. Embedded in specific urban settings and under certain conditions, these socio-technical mediations allow the spread of services beyond the club of conventional network subscribers. This mode of industrial organization for urban services does therefore exist in all these cities and its techniques are known; but it is not a universal method to generalize services. Its share in the total supply of services is instead a powerful criterion for differentiation between cities, as shown in figure 1.

Networked urban services: an assessment of disenchantment

For thirty years, the resistance to the spread of networks has generally been analyzed in terms of the institutional failure of conventional services and the policies that were implemented have focused on two main goals: institutional reform (privatization, liberalization, decentralization) and managing poverty so that users become solvable. In fact, the dominant idea is that these failures are primarily the result of insufficient investments and poor management of public services. Until the 1980s, the dominant model was a public enterprise, at the national or local level, with varying success. Subsequently, management inefficiency and poor service coverage has led to questioning the legitimacy of public monopolies. Proposals for change, inspired by the presumed superiority of the organization and management models of private enterprise, led to an international "consensus" embodied in the notion of "public-private partnership" (PPP) and various types of delegated management contracts (Kerf, Smith, 1996; Kessides, 2005; Foster, Briceño-Garmendia, 2010).

However, no empirical analysis, mainly in the sectors of water and electricity, has unambiguously demonstrated the ability of the private sector to improve service management while providing universal service. This holds particularly true concerning water supply to urban shantytowns (Trémolet, 2006; Kirkpatrick *et al.*, 2006; Prasad, 2006; Banerjee *et al.*, 2008). As a recent summary has shown, nowhere have public-private partnerships fulfilled their promises. Performance assessments of over 65 major contracts in the developing world on the basis of four indicators (extending coverage, service quality, operational efficiency, rate changes) concluded that few contracts are effective in more than one or two of these criteria (Marin, 2009).

The reasons for the success or failure of these reforms in Africa, as elsewhere in the developing world, (Prasad, 2006; Gómez-Ibáñez, 2008; Gassner *et al.*, 2009; Marin, 2009; Mugabi, Castro, 2009; Jaglin, Zérah, 2010) have been interpreted in terms of governance and regulation. First, the weaknesses of the delegation system, properly analyzed in the North, are often magnified in the South. Incomplete contracts were insufficient to ensure efficient risk allocation[8], to guarantee secure investments over time, and to provide an adequate response to macroeconomic risks. In addition, regularizing these contracts, usually implemented by centralized and specialized committees, has proved difficult due to information asymmetry, regulatory capture, and a lack of skills. Second, the economic balance of contracts has been difficult to achieve. Pricing policies have sparked social and political protests, while investment and expansion programs have been confronted with the difficulty of mobilizing sufficient capital. Third, contrary to the postulate that private operators have a greater capacity for innovation in servicing poor neighborhoods, generalized, affordable coverage for all has basically failed (Hall, Lobina, 2006 and 2007).

At the same time, social policies (which subsidize the initial costs of connection and consumption) have failed to render solvable the many very poor users (Boccanfuso *et al.*, 2005; Dagdeviren, 2008; Kayaga, Franceys, 2007), including in an emerging country like South Africa, where financial flexibility exists and a redistributive policy has been implemented for over fifteen years (Jaglin, 2008).[9]

These approaches do not call into question conventional networks. For many scholars and practitioners, the development model remains an "S-curve", modeling the long-standing trend of spaces with universalized network coverage (Dupuy, 2011). In this model, the lack of equipment or access is considered a lag that can be made up

8. Particularly commercial risks, considering that client files are rarely reliable, that operating revenues are low, that public administrations are among the worst payers, and that in a number of African countries, public authorities do not respect their commitments in terms of rate policies (Trémolet, 2006).

9. This policy first consisted of guaranteeing free, minimum service to all municipal account holders, including most notably 6m^3 of water and 50 kWh per month, as well as various fiscal deductions. Faced with protests and jurisprudence, these municipal policies have today evolved towards targeted aid (instead of universal free usage) that better accounts for the "invisible" poor and towards a differentiation of guaranteed services (for example in the water sector in Johannesburg, see Aubriot, 2012).

over time, while alternative arrangements are temporary and destined ultimately to be incorporated within the conventional system. Economic theory has emphasized the essential role of clubs and economies of scale in the expansion phase of networks and the effects of resistance (income constraints, more expensive connections with increasing technical difficulties) on the subsequent phase of more moderate network growth (Dupuy, 2011). Historical approaches emphasize the role of public policy in the deployment and generalization of networks, especially to overcome environmental resistance (Coutard, Pflieger, 2002; Scherrer, 2006). It is in relation to these models and their theories that dominant scholarship has conceived of public policy in African networks. In so doing however, it has also marginalized other studies that are critical of modernist transfer models, of conventional networks, and their reform (Darbon, 2008). The latter insist on the lures of strategies to generalize services in the absence of institutions and organizational principles of large modern bureaucracies, which have triggered their development in industrialized countries. For Augustin Maria, scientific, technical, and practical "questioning" of the conventional system, expressed through alternative socio-technical devices, are "the potential seeds of a profound change in the [conventional] system" (Maria, 2007, p. 251)[10]. In these approaches, the proliferation of alternative services is not a "resistance" but an adaptation to the specific, dominated conditions of urbanization in the South: it is the structural expression of the dysfunctioning of the conventional network model.

African "resistance" to deploying networks: delay or structural inadequacy?

It is therefore the very model of networked services that must be questioned, as suggested by Jean-Marc Offner (1993), not only from the point of view of its internal logic, nor even of the policies that support its development, but rather in light of the historical, political-institutional, socio-technical, and urban conditions of its deployment.

The genesis of networks and path dependency

The management and reform of networked systems remain highly path-dependent.[11] Conventional networks are indeed socio-technical systems embedded in their spatio-temporal environment and their first phase of expansion is inseparable from the welfare state and the modern industrial societies of the twentieth century, in which their dissemination and democratization have been fundamental to the emergence of a sense of national cohesion (Graham, Marvin, 2001, p. 74) and, as was the case in France with the achievement of the principle of republican equality (Coutard, Pflieger, 2002). This twentieth century European model was imported into the former African colonies, with modern spatial planning tools and a certain conception of subsidized public housing. However, scholarship highlights the shortcomings of colonial urban planning, its inability to adapt the values and representations for which it stood, the mismatch between the resources needed for its implementation and those available to local authorities (Massiah, Tribillon 1988; Devas, Rakodi, 1993). Public utility networks are no exception. Originally designed and built by engineers sent from European countries, they incorporated technical standards and legal and socio-economic measures that mimicked those that framed metropolitan infrastructures. However, they were not replicas of European "public services" but

10. "...germes potentiels d'une modification profonde du système [conventionnel]."

11. The notion of "path dependency" states that the choices made at a given moment (for example, the adoption of a technical norm) condition a unit's learning processes and organizational routines, thereby largely influencing its strategy and ulterior trajectory.

deteriorated forms whose development was immediately skewed by local conditions of appropriation.

Thus, as pointed out by many historical case studies, urban development was initially limited by an "economic Malthusianism" combined in French colonies with cumbersome procedures and bureaucratic conflicts, which from the outset, resulted in significant delays in the physical infrastructures of urban sprawl. With the exception of a slight improvement in 1950s, the lack of financial means, which lasted throughout the colonial period and into the post-independence decades, hampered not only formal urban planning but also prevented the emergence of the concept of public benefits and even more so, its materialization (Chanson-Jabeur *et al.*, 2004).

However, budgetary constraints and the reluctance of private investors does not explain everything. Inequalities in infrastructures are also a legacy of the colonial policy of segregation. Networks were designed and built to meet the demands of the metropolitan and local elite. The fact that they were unfinished and incomplete participated in the political project of asserting the colonizers' "moral superiority". Thus, "the Western ideal of a unitary, orderly city, laced by networked infrastructure" (Graham, Marvin, 2001, p. 82) was redesigned from the start to give way to a discriminatory infrastructure project, as shown in various political and urban contexts: the connection rates of the EEAO (Water and electricity company in West Africa) and the SAFELEC in West Africa (Hibou, Vallée, 2007, p. 7-8); the history of the domestication of water in the Zambian Copperbelt cities (Kazimbaya-Senkwe, Guy, 2007); the origins of the supply of running water in Kampala (Nilsson, 2006) or in Tamatave (Madagascar)(Rajaonah, 2004).

Though the differentiated quality of physical infrastructure was from the start the result of the discriminatory practices of colonial administrations, it was then amplified by chronic delays in the execution of works even as urban growth was accelerating (Chanson-Jabeur *et al.*, 2004). Indeed, after 1950, the public authorities lost control of the expansion mechanisms of vast, unplanned, poor urban spaces; whereas planning and production logic of conventional infrastructures generated a growing and unsatisfied demand for services. It soon became clear that the networks, adapted to serving formal urban neighborhoods, were not capable of coping with rapid urban expansion. As summarized by David Nilsson (2006), concerning water in Kampala, even though the system was both financially and socially "sustainable" within its colonial environment, the available services were not adapted to the African population. Expanding them later to the urban poor based on the principle of "water for all" required inaccessible funding mechanisms even as the maintenance of the network for the middle and upper classes proved to be increasingly problematic.

Political and institutional determinants of the "performance" of utility companies

The actual performance of networked services cannot be assessed outside of their macro-economic and political environment. In Africa, as elsewhere, the specific characteristics of networks (natural monopoly, externalities[12]) justified forms of state intervention in response to market failures, but the post-colonial proliferation of public and semi-public companies, in African situations of extreme economic dependence, were also responses to the economic and social concerns of States, considered to be agents of development (Sandbrook, 1988). A catastrophic evaluation of this governance was produced in the 1980s. The causes of this failure can, at least partially, be attributed to the context:

12. For a summary of the way in which economy has theorized these notions (along the same lines as footnote 7), see Lévêque, 2004.

economic difficulties resulting from the oil crises, deterioration of Africa's position in international trade, the restriction of national fiscal resources. Other causes are to be found in the monopoly of these companies and the recurring problems of public governance (government failure). None of these reasons are specific to Africa, but their expression was exacerbated by the nature of the post-colonial state in Africa. Political intrusion was reinforced by the logic of a neo-patrimonial and rhizome state (Bayart, 1989), linked to a power structure built on personal loyalty and relations of clientelism, in contradiction with the requirements of bureaucratic efficiency and legal rationality (Sandbrook, 1988). The concept of a neo-patrimonial state thus seeks to account for two converging features: the failure of institutionalizing state power and a "model" of neo-patrimonial governance based on the overlap of the generative functions of resources and the utilisation of ties with the state apparatus to extract and redistribute these resources (Médard, 1991).

In this context, it is hardly surprising that public utilities have been intensely sought as means to redistribute resources (jobs and services); if they participated in the legitimation strategies of African leaders, it was not on an objective basis of social and spatial equity. In a neo-patrimonial context, the control of public goods was a source of political favoritism and was used to cement the loyalty of the urban middle classes, according to a logic that is clearly different from the Western ideal of integrative equality. Thus, only the superficial dimensions of the European model of public utility networks were transferred and replicated in Africa. The technical tools (the physical infrastructure) were not accompanied, in these countries, by the adoption of the underlying political and economic model of regulation (Darbon, 2008). Governance and institutional principles of management of conventional service are thus not integrated into the local socio-political processes and are not incorporated as common rules into the social contract. Therefore, alongside the official model of conventional service, many other supply systems continue to exist on the basis of norms and rules but also on the values that urban practices take on as "legitimate" references to daily life.

Decisive urban contexts

Networks and reform in African cities also depend on all the circumstances surrounding the definition of a social norm for basic "public" service. Thus, the pervasiveness of poverty, unemployment, a largely informal labor market (often close to 60% of the workforce), the marginal role of social security systems, and practices of socio-demographic solidarity strongly influence service consumption practices. Chronic vulnerability leads to unstable and variable demand, combining paid and free access (for water, energy, and even waste disposal). The heterogeneity of urban conditions, in terms of monetary income, cultures and perceptions, also shape the urban demand for services. While the African urban elites enthusiastically embrace cosmopolitan consumerism, the urban poor are living in makeshift conditions, with little political voice, other than in the street, as demonstrated during the "electricity riots."[13]

Finally, service delivery configurations are shaped by the dominant models of urbanization: rapid population growth accompanied by "floating" populations; nonexistent or very inefficient spatial planning and competing land tenure systems that result in an urban fabric made up of vast, informally administered areas; weak institutional capacity and conflicting modalities of service governance in heterogeneous societies. As emphasized by Abdou Maliq Simone (2010, p. 2), infrastructure

13. South Africa is an exception to this rule, with the development of a militant use of this right linked to the inscription of social rights in the 1996 Constitution, including the right to water. (Aubriot, 2012).

upgrades involve cities where "the increasing volatility of urban life, both productive and deleterious, itself generates wide-ranging political, social and cultural impacts which are difficult to predict and assess."

The conventional network model has therefore never fully functioned in African cities. Even though a centralized supply network is generally the most economical means of providing basic services, as well as being the type preferred by consumers (Kjellén, McGranahan, 2006), policies based exclusively on conventional services are faced with a mismatch between the expectations from the model and urban realities. This contradiction leads to rationing the supply, financial stress, institutional crises, and the exclusion of an "incompressible" proportion of households for whom the lowest rates remain too high.

The analysis of a large number of situations in different urban settings and across several types of services, suggests two paths of study. The failure of the conventional network is certainly due to institutional and governance issues; but the impediments to universalization are basically the result of an offer that is not adapted to certain characteristics of African urbanization. In contrast, while socio-technical mediations and their ancillary innovations are expedient solutions; they are more importantly a pragmatic response to the dislocation between supply and demand. Far from being an archaic legacy, they also respond to the recent spread of low-cost technologies and the democratization of technical innovations, whose costs are dwindling: mobile telephony, lightweight, efficient batteries, smart meters… If these supply configurations are not the simple expression of either the breakdown in public management or the failure of privatization reforms, what questions are they answering?

An interpretative framework for the mismatch between networks and African cities

"Even if the network is there, all the necessary elements for it to play its role have not come together." (Dupuy, 2011, p. 12).[14] While this is the case in African cities, we would suggest that it is precisely because all the elements cannot be found. Of course, here as elsewhere, urban societies must solve problems of water supply, energy distribution, sanitation, but the universal (or nearly universal) network is a contingent solution that African dynamics have not yet encouraged, and nor will they in the near future.

To understand this disconnect between the conventional network and many African urban configurations, we suggest an interpretive framework for relationships between economy, urbanization, and networks inspired by the research of the French school of regulation (Boyer, Saillard, 1995; Aglietta, 1997) and that of Dominique Lorrain (2002) on European urban capitalisms. From the first, we have taken the idea that networked services participate in socio-economic compromises that were at the core of Fordist modes of regulation and that were one of the various means used to pursue economic and social progress. From the second, we selected the idea that the management methods of urban services stem from the various models of urban capitalism developed in Europe in the mid nineteenth century, "to face the challenge of industrialization"[15] (Lorrain, 2002, p. 203) and that, starting with founding decisions and several bifurcations, they then followed "authentic […] paths of dependence" (*ibid.*, p. 234). In other words, the historical circumstances of the emergence and development of networked urban services in industrial cities, especially European, have produced models we have dubbed Fordist and which share three common traits.

14. "Même si le réseau est là, tous les éléments nécessaires pour qu'il joue son rôle ne se trouvent pas réunis."

15. "Pour faire face au défi de l'industrialisation".

First, a service provider system aiming to satisfy the growing domestic and industrial demand for individual services provided *via* a centralized network infrastructure. Second, an institutional and technical system – a network monopoly – that ensures, through standardization and interconnection, economies of scale that allow an offer of universal services to be generalized. Finally, a "virtuous circle" of network development in a context where productivity gains and wage increases promote a "convergence" of living standards and mass consumption of standardized goods; as well as within which the collective belief in the ability of new technologies to bring social change is favorable to universal deployment of networks in that space (due to social equity, economic competitiveness, and development)(Scherrer, 2006). Conventional services stemming from these models are based on a "Fordist compromise" and thus closely linked to the development conditions of industrial cities.

Table 1/ Fordist model of networked urban services (*i.e.* a conventional network) and service supply configurations in African cities

	"Fordist" model of networked urban services	Service supply configurations in developing cities
Urban environment	• Planned and controlled. • Equipment › settlement.	• Uncontrolled and informal. • Settlement › Equipment.
Household financial situation	• High rate of employment, salaried employment dominant. • Stable purchasing power.	• Self-employment dominant in informal sector. • High vulnerability. • Massive poverty (60-80% in SSA cities).
Delivery system	• A public or private provider with a regulated monopoly.	• A non-universal, public provider and competing profit-oriented providers, with poor to non-existent connections.
Offer	• Reliable and continuous. • Exclusive, steady and standardized (economies of scale, standardization, club effects). • Fixed rates (cross-subsidization, equalization). • A connection, a contract, a regular invoice (monthly, bimonthly).	• Irregular and intermittent. • Competitive, heterogeneous, à la carte services. • Rates at cost price. • Pay-per-use, available credit, subscription on demand, etc.
Demand	• Convergents.	• Permanently heterogeneous.
Ability to pay	• Stable or increasing over the long term. • Regular over the short term (salaried workers dominant).	• Variable and reversible over short and long term (poverty, insecurity, vulnerability).
Household consumption	• Constant and predictable (consistent with a pattern of a "standardized" evolution based on residential and family life). • A single supplier. • Commercial losses manged.	• Variable (depending on income and labile family and residential configurations). • Multiple suppliers that work together according to criteria such as usage, price, accessibility. • Significant business losses (illegal connections).
Industrial consumption	• Massive and growing.	• Very uneven or non-existent (significant amount of small and medium companies and micro-enterprises, illegal connections).

Different variants of these network models have been transplanted in Africa. However, in urban contexts where socio-economic compromises do not stem from Fordist modes of regulation, where salaried workers play only marginal roles[16] and where urban challenges are largely disconnected from those of industrialization, these models have failed to develop universal service. In addition, the leverage of public policy, which had in the past been effective, has disappeared. Thus, cholera, a powerful incentive for collective sanitation in nineteenth century, European cities (Swaan, 1995), is endemic in many cities in the Gulf of Guinea and East Africa, yet it has lost its mobilizing force in urban contexts where the middle class can protect itself individually and collectively from the disease without taking on the burden of equipping poor neighborhoods (Chaplin, 2011). In addition, improved service is often market driven and dependent on the ability of wealthy citizens to adopt individual solutions.[17] This is more indicative of its success than its capacity to encourage urban authorities to pool service costs and externalities (Maria, 2006). African urban realities therefore lend themselves poorly to the universal deployment of the network; despite the possibility of reductive simplification. The major discrepancies are summarized in table 1.

Poverty and informality; a large base of small, unprofitable consumers; little power to drive industrial and commercial demand; the creation of urban space outside the framework of administered urban planning: the urban realities of African countries do not currently possess the necessary conditions for universalized networks.

The footprint of urban informality in supply configurations

It is within such a context that thrives both individual and collective alternative service economies, according to two combined approaches: first, the adaptation of end-user infrastructure and its management to democratize an accessible offer; second, the creation of features that allow certain service benefits to be offered beyond the scope of said infrastructure. Each of these offers is based on a specific set of resources, a mode of governance, and each is associated with a territorial configuration. Neither has the capacity to concomitantly meet all the urban demands and to be deployed throughout all urbanized areas. While conventional services stem from a supply logic calculated according to standardized norms and principles, alternative services stem from market logics and the segmentation of clients (table 2).

Thus, in the field of services, African success stories are demand-driven. Some of these requests come from well-off clients, both individual or business, dissatisfied with the poor quality of public service and who have access, often through local markets, to technical solutions for a reliable supply at an acceptable cost. Other requests come from lower urban classes (including both very poor urban populations and households in the process of achieving "slight prosperity") with generally illegal housing.

The spread of alternative offers aimed at poor clients stems, in certain cases, from highly regulated innovations based on the network (this is the case of the electrification of Casablanca's shantytowns: figure 3), most of the time, however, it proceeds from individual and collective urban initiatives. The latter are financially independent, receive no subsidies, and exhibit characteristics typical of the informal economy: unrecorded, not subject to taxes, very slightly capitalistic, legally vulnerable (Lautier, 2004). These offers are flexible and responsive; when compared to large networks, they adapt better to urban growth, poverty, changes in land use, and the nomadism of small economic activities. The

16. Even though it structured social formation in Europe (Castel, 1995).

17. Drilling and individual storage for water, solar PV and thermal systems for energy, septic tanks for sanitation, private waste collection.

Table 2/ Simplified typology of unconventional offerts		
	Poor urban dwellers, informal settlements	**Companies and middle class; planned urban spaces**
Economic systems	• Informal cottage industry services. • Informal and very slightly capitalistics production units. • Offer (quantity and quality) calibrated by demand, high respondiveness to changing demands and evolving economic situations (rapid turn-over). • Regulated by competition but also by forms of mafia control.	• Service companies, regulated by competition and contracts. • Small and mid-sized local companies or consortia with foreign subsidiaries. • "Modern" methods of production (equipment, skills, management). • Investment capacity, "legal" employment contracts.
Customer relationship	• Business transactions framed by dominant social rules. • Services are non standard, tailored, on-demand, adapted to micro-payments. • Price = cost price.	• Business transactions. • Standardized service provided according to norms and specifications known in advance and often defined by a commercial contract. • Price = cost price.
Production techniques	• Cottage industry, use and appropriation of existing, local or imported techniques. • Little or no technical innovations.	• Industrial techniques, capacity for innovation.
Public service missions and principles	• Nones. • Cost price high (no economies of scale) with no subsidies or redistribution (no social equity). • Demand-driven geographical distribution (no spatial equity). • Predatory relationship to the environment (resources used without compensation, pollution). • Continuity not assured.	• None. • Market price without subsidies or redistribution (non social equity). • Demand-driven geographical distribution (no spatial equity). • Variable relationship with environment (ecological modernization market). • Partially ensured continuity.

large networks are dependent on technological trajectories developed over the long term, on weighty institutional processes, and on slow and rigid planning systems. Only slightly capitalistic, these alternative offers are easily "re-deployable" elsewhere. Even though initial barriers, both financial and non-financial, are far from negligible (*i.e.* when activity is controlled by mafia cartels[18]), they do not prevent new offerings from developing when there is a solvent demand. The low, flexible remuneration and the strength of personal and social ties in professional relationships explain the capacity of informal service providers to withstand the fluctuating circumstances of urban markets and the high vulnerability of households, with irregular and uncertain incomes. The governance of such offers combines trade and community minded coordination, particularly adapted to the rules of exchange prevailing in the working class neighborhoods of African cities. Thus, informality and illegality do not exclude forms of social integration through the creation of an access standard consistent with the absence of networks. Users are embedded in social and trade networks that ensure a diversity in the quality of services (door to door hawking, public or private access points, with or without the guarantee of quality and regularity, with or without a subscription, etc.).

18. This is the case for drinking water in certain Nairobi shantytowns.

This informal service economy is therefore not an archaic residue. By contributing to the reproduction of cheap labor, it is one of the expressions of flexibility at work in production and one of the modalities specific to African cities entering globalization. By satisfying the basic needs of the urban poor and redistributing income, albeit meager, to unskilled workers it makes the city "livable", all the while contributing to the dominant economic processes that create urban poverty.

Conclusion

The historically constructed mismatch between networks and African cities is the result of the inappropriateness of the socio-technical system needed for conventional services: its technical infrastructure, its organization, its management and financing, the actors and skills it mobilizes, and also the political objectives that it transmits or of which it is an instrument, and the values it embodies. The universalizing process of basic urban services thus currently requires provider configurations that also include alternative services, which appear as pragmatic responses to needs unmet by conventional service. Each offer takes advantage of niches, at the bottom or top of the market, and together, in the context of variable yet often competitive relationships (Katsongo, 2010), they exploit the heterogeneity of demands and payment capacities such as those found in the urban situations of highly unequal societies. This technical and managerial pluralism responds to the particular circumstances of urbanization in Africa: rapid demographic and spatial growth, great poverty, weak institutions, tenacity of colonial legacies, and of the processes of institutional and iconic cognitive transfers of "projected societies" (Darbon, 2008).

Though they greatly contribute to the accession of city dwellers to many urban amenities, these provider configurations also raise a number of problems: costly for consumers, they are often unregulated in terms of quantity and quality, and are also highly resistant to reform.[19] Their regulation is also difficult to design because the issues raised are as diverse as the variety of alternative arrangements (Jaglin, 2010).[20]

A first step would be to analyze the failure of the Fordist model of service delivery in cities that are largely or wholly beyond the model of Fordist industrial economy. However, it is not easy to go from a description of provider configurations to the formulation of public policies on access; because the central issue, as noted by Henry Coing (2010) on water, is that of the geographic situation of the social construction of services and their collective management, of the definition and legitimacy of the rules governing their operation. It is therefore a fundamentally political issue.

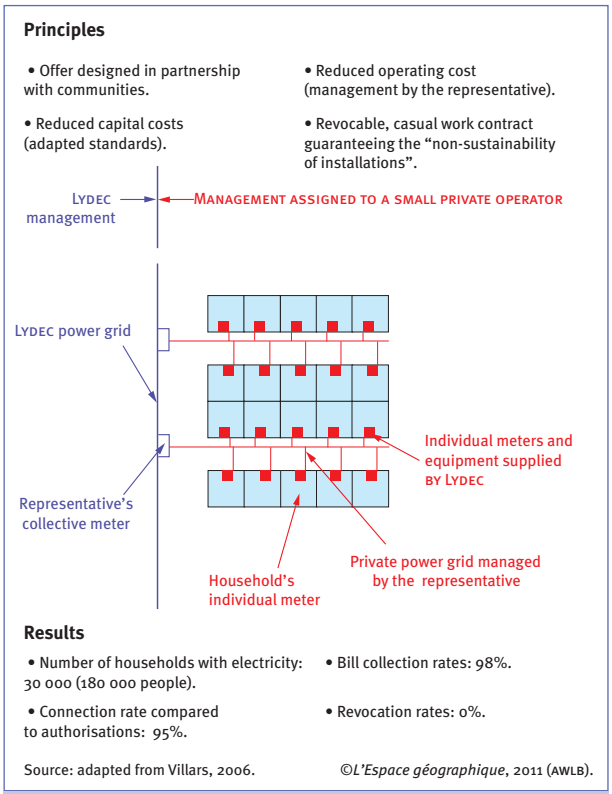

Fig. 3/ Principles of electrification program in the slums of Casablanca

19. The standardization of informal offers has a tendency to recreate informality.

20. In middle class neighborhoods, they elicit fears in terms of urban splintering (Graham, Marvin, 2001), of technical and accounting desolidarization, of the over-use of collective resources leading to the deterioration of overall ecological balances. These offers, aimed at the "bottom of the pyramid", ask crucial questions on the solvability of households and their investment potential, on the brutal forms of social and economic exploitation in informal service markets, on defined access priorities at the expense of health and environmental concerns.

References

Aglietta M. (1997). *Régulation et crises du capitalisme*. Paris: Odile Jacob, coll. "Opus", no 65, 486 p.

Aubriot J. (2012). *Accès à l'eau et usages militants du droit. Étude de cas à Soweto*. Paris: Agence française de Développement, coll. "Focales" , no. 10, 153 p.

Banerjee S., Skilling H., Foster V., Briceño-Garmendia C., Morella E., Chfadi T. (2008). *Ebbing Water, Surging Deficits: Urban Water Supply in Sub-Saharan Africa*. Washington D.C.: La Banque mondiale, The International Bank for Reconstruction and Development, Background Paper 12, 83 p.

Bayart J.-F. (1989). *L'État en Afrique : la politique du ventre*. Paris: Fayard, coll. "L'Espace du politique", 439 p.

Blanc A., Cavé J., Chaponnière E. (2009). *Les Petits Opérateurs privés de la distribution d'eau à Maputo*. Paris, Johannesburg: Agence française de Développement, Institut français d'Afrique du Sud, 44 p.

Boccanfuso D., Estache A., Savard L. (2005). *A Poverty and Inequality Assessment of Liberalization of Water Utility in Senegal: A Macro-Micro Analysis*. Québec: Université de Sherbrooke, Groupe de recherche en économie et développement international (GRÉDI), working paper no. 05-13, p. 5-13. http://pages.usherbrooke.ca/gredi/wpapers/GREDI-0513.pdf

Boyer R., Saillard Y. (eds)(1996). *Théorie de la régulation. L'état des savoirs*. Paris: La Découverte, coll. "Recherches", 568 p.

Castel R. (1995). *Les Métamorphoses de la question sociale : une chronique du salariat*. Paris: Fayard, coll. "L'Espace du politique", 490 p.

Chanson-Jabeur C., Coquery-Vidrovitch C., Goerg O. (ed.)(2004). *Politiques d'équipement et services urbains dans les villes du Sud : étude comparée*. Paris: Éditions de l'Harmattan, 428 p.

Chaplin S.E. (2011). "Indian cities, sanitation and the state: The politics of the failure to provide". *Environment and Urbanization*, vol. 23, no. 1, p. 57-70.

Chéneau-Loquay A. (2010). *Modes d'appropriation innovants du téléphone mobile en Afrique*. Paris: Ministère des Affaires étrangères et européennes, Union internationale des télécommunications, 40 p.

Coing H. (2010). "Préface". In Schneier-Madanes G. (ed.), *L'Eau mondialisée. La gouvernance en question*. Paris: La Découverte, coll. "Recherches", p. 12-24.

Coutard O. (2010). "Services urbains : la fin des grands réseaux ?". In Coutard O., Lévy J.-P. (eds), *Écologies urbaines. État des savoirs et perspectives*. Paris: Économica-Anthropos, coll. "Villes", 372 p.

Coutard O., Pflieger G. (2002). "Une analyse du rôle des usagers dans le développement des services de réseaux en France". *Entreprises et Histoire*, no. 30, p. 136-152.

Dagdeviren H. (2008). "Waiting for miracles: The commercialization of urban water services in Zambia". *Development and Change*, vol. 39, no. 1, p. 101-121.

Darbon D. (2008). "Réformer un inexistant désiré ou supprimer un inopportun incontournable? Le service public confronté à l'État et aux sociétés projetées en Afrique". *Téléscope*, p. 98-112. http://www.enap.ca/OBSERVATOIRE/docs/Telescope/Volumes12-15/Telv14n1Darbon.pdf

Devas N., Rakodi C. (eds)(1993). *Managing Fast Growing Cities. New Approaches to Urban Planning and Management in the Developing World*. Harlow: Longman Scientific and Technical, 338 p.

Dupuy G. (2011). "Fracture et dépendance : l'enfer des réseaux ?". *Flux*, no. 83, January-March, p. 6-23.

Foster V., Briceño-Garmendia C. (eds)(2010). *Africa's Infrastructure: A Time for Transformation*. Paris, Washington: Agence française de Développement, The World Bank, coll. "Africa development forum", 356 p.

Gassner K., Popov A., Pushak N. (2009). *Does Private Sector Participation Improve Performance in Electricity and Water Distribution?* Washington: The World Bank, Public-Private Infrastructure Advisory Facility, coll. "Trends and Policy Options", no. 6, 101 p.

Gómez-Ibáñez J.A. (2008). *Private Infrastructure in Developing Countries: Lessons from Recent Experience*. Washington: The World Bank, Department for International Development, background paper, no. 43, 46 p.

Graham S., Marvin S. (2001). *Splintering Urbanism. Networked Infrastructures, Technological Mobilities and the Urban Condition*. London, New York: Routledge, 512 p.

Hall D., Lobina E. (2006). *Pipe Dreams. The Failure of the Private Sector to Invest in Water Services in Developing Countries*. London: Public Services International, PSIRU, World Development Movement, 60 p. http://www.psiru.org/reports/2006-03-W-investment.pdf

Hall D., Lobina E. (2007). "Profitability and the poor: Corporate strategies, innovation and sustainability". *Geoforum*, vol. 38, no. 5, p. 772-785.

Hibou B., Vallée O. (2007). *Énergie du Mali, ou les paradoxes d'un « échec retentissant »*. Paris: Agence française de Développement, working paper, no. 37, 40 p. http://www.afd.fr/webdav/site/afd/shared/PUBLICATIONS/RECHERCHE/Scientifiques/Documents-de-travail/037-document-travail.pdf

Jaglin S. (2005). *Services d'eau en Afrique subsaharienne. La fragmentation urbaine en question*. Paris: CNRS Éditions, coll. "Espaces et Milieux", 244 p.

Jaglin S. (2008). "Differentiating networked services in Cape Town: Echoes of splintering urbanism?". *Geoforum*, vol. 39, no. 6, p. 1897-1906.

Jaglin S. (2010). "Accès à l'eau, accès à la ville". In Jacquet P., Pachauri R.K., Tubiana L. (dir.), *Villes : changer de trajectoires*. Paris: Presses de Sciences Po, p. 183-191.

Jaglin S., Zérah M.-H. (2010). "Eau des villes : repenser des services en mutation". *Revue Tiers-Monde*, no. 203, p. 7-22.

Katsongo K. (2010). *Alternatives de partenariats pour la gestion de l'eau potable dans les quartiers pauvres des zones urbaines : cas de Kinshasa*. Montréal: Université de Montréal, Faculté de l'aménagement, PhD thesis, department of Urban Planning, 214 p. + appendix.

Kayaga S., Franceys R. (2007). "Costs of urban utility water connections: Excessive burden to the poor". *Utilities Policy*, vol. 15, no. 4, p. 270-277.

Kazimbaya-Senkwe B.M., Guy S.C. (2007). "Back to the future? Privatisation and the domestication of water in the Copperbelt Province of Zambia, 1900-2000". *Geoforum*, vol. 38, no. 5, p. 869-885.

Kerf M., Smith W. (1996). *Privatizing Africa's Infrastructure: Promise and Challenge*. Washington: The World Bank, technical paper, no. 337, 120 p.

Kjellén M., McGranahan G. (2006). *Informal Water Vendors and the urban Poor*. Londres: International Institute for Environment and Development, Human Settlements Discussion Paper Series, 26 p. http://www.sei-international.org/mediamanager/documents/Publications/Water-sanitation/informal_water_vendors.pdf

Kessides I.N. (2005). « Infrastructure, privatization and regulation: Promises and perils ». *World Bank Research Observer*, vol. 20, no. 1 p. 81-108.

Kirkpatrick C., Parker D., Zhang Y.-F. (2006). "An empirical analysis of state and private-sector provision of water services in Africa". *The World Bank Economic Review*, vol. 20, no. 1, p. 143-163.

Lautier B. (2004). *L'Économie informelle dans le tiers monde*. Paris: La Découverte, coll. "Repères", 122 p.

Lévêque F. (2004). *Économie de la réglementation*. Paris: La Découverte, coll. "Repères", 122 p.

Lorrain D. (2002). "Capitalismes urbains. Des modèles européens en compétition". *L'Année de la régulation*, no. 6, p. 195-239.

Maria A. (2007). *Quels modèles techniques et institutionnels assureront l'accès du plus grand nombre aux services d'eau et d'assainissement dans les villes indiennes ?* Paris: Université Paris Dauphine, PhD thesis, department of Economic Sciences, 272 p.

Marin P. (2009). *Public-Private Partnerships for Urban Water Utilities. A Review of Experiences in Developing Countries*. Washington: The World Bank, Public-Private Infrastructure Advisory Facility, 192 p.

Massiah G., Tribillon J.-F. (1988). *Villes en développement. Essai sur les politiques urbaines dans le tiers monde*. Paris: Éditions de La Découverte, coll. "Cahiers libres", 320 p.

Médard J.-F. (1991). "L'État néo-patrimonial en Afrique noire". In Médard J.-F. (ed.), *États d'Afrique noire. Formations, mécanismes et crise*. Paris: Éditions Karthala, p. 323-353.

Mugabi J., Castro V. (2009). *Water Operators Partnerships. Africa Utility Performance Assessment*. Nairobi (Kenya): The World Bank, Water and Sanitation Program-Africa, Final Report, 160 p. http://www.unhabitat.org/downloads/docs/WOP_Report.pdf

Nilsson D. (2006). "A Heritage of unsustainability? Reviewing the origin of the large-scale water and sanitation system in Kampala, Uganda". *Environment and Urbanization*, vol. 18, no. 2, p. 369-385.

Offner J.-M. (1993). "Le développement des réseaux techniques : un modèle générique". *Flux*, no. 13-14, p. 11-18.

Olivier de Sardan J.-P., Abdoulkader A., Diarra A., Issa Y., Moussa H., Oumarou A., Tidjani Alou M. (2010). *Gouvernance locale et biens publics au Niger*. Londres: Overseas Development Institute, background paper, no. 10, 35 p.

Prasad N. (2006). "Privatisation results: Private sector participation in water services after 15 years". *Development Policy Review*, vol. 24, no. 6, p. 669-692.

Rajaonah F. (2004). "Usages et usagers de l'eau à Tamatave pendant la période coloniale (1896-1960)". In Chanson-Jabeur C. Coquery-Vidrovitch C., Goerg O. (eds), *Politiques d'équipement et services urbains dans les villes du Sud : étude comparée*. Paris: Éditions de l'Harmattan, p. 171-195.

Sandbrook R. (1988). "Patrimonialism and the failing of parastatals: Africa in comparative perspective". In Cook P., Kirkpatrick C. (eds), *Privatisation in Less Developed Countries*. New York, London: Harvester Wheatsheaf, p. 162-179.

Scherrer F. (2006). "L'accès différencié aux services en réseau : proposition d'un cadre analytique", seminar "L'accès aux services urbains en réseau dans les villes libanaises", April 28, rectorate of University of Lebanon, Beirut. http://halshs.archives-ouvertes.fr/SUVL

Simone A. (2010). "Infrastructure, real economies and social transformation: assembling the components for regional urban development in Africa". In Parnell S., Pieterse E., Simon D., Simone A., *Urbanization imperatives for Africa: Transcending Policy Inertia*. Cape Town: Edgar Pieterse, African Centre for Cities, p. 28-45. http://africancentreforcities.net/papers/22/

Swaan A. de (1995). *Sous l'aile protectrice de l'État*. Paris: Presses universitaires de France, coll. "Sociologies", 378 p.

Trémolet S. (2006). "Un point sur les privatisations de l'eau en Afrique". *Annales des mines*, série "Responsabilité & Environnement", no. 42, April, p. 59-68. http://www.annales.org/re/2006/re42/Tremolet.pdf

Watkins K. (2006). *Beyond Scarcity: Power, Poverty and Global Water Crisis*. New York: United Nations Development Programme (UNDP), Human Development Report 2006, 422 p.

Zaki L. (2010). "L'électrification temporaire des bidonvilles casablancais". *Politique africaine*, no. 120, p. 45-66.