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Kingdom of Morocco
Recent Economic Developments in Infrastructure (REDI)
Water Supply and Sanitation Sector

June 2004

Middle East and North Africa Region
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World Bank Document

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CURRENCY EQUIVALENT

(Exchange rate effective as of June 2004)

Currency Unit	=	Moroccan Dirham (MAD)
MAD 1.00	=	US$ 0.1064
US$ 1	=	MAD 9.40

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACCRONYMS

AGR	= Administration du Génie Rural (Rural Development Administration)
AMENDIS	= Concessionnaire consortium for Tangiers and Tetouan
CSEC	= Conseil Supérieur de l'Eau et du Climat (High Council on Water and Climate)
DEA	= Direction de l'Eau et de l'Assainissement (Water and Sanitation Directorate / Ministry of Interior)
DEPP	= Direction des Entreprises Publiques et de la Privatisation (Directorate of Public Corporations and Privatization/Ministry of Finance)
DGCL	= Direction Générale des Collectivités Locales (General Directorate of Local Governements/Ministry of Interior)
DGH	= Direction Générale de l'Hydraulique (Directorate of Water Resources / MATEE)
DRSC	= Direction des Régies et des Services Concédés (Directorate of Public Utilities and Concessions/Ministry of Interior)
ENNVM	= Enquête Nationale des Niveaux de Vie des Ménages (National Household Living Standards Survey)
ESW	= Economic and Sector Work
GDP	= Gross Domestic Product
GOM	= Government of Morocco
LYDEC	= Concessionaire consortium for Greater Casablanca
MAD	= Moroccan Dirham
MATEE	= Ministère de l'Aménagement du Territoire, de l'Eau et de l'Environnement (Ministry of Land Planning, Water and Environment)
MENA	= Middle East and North Africa Region
NRW	= Non-revenue water
O&M	= Operation and Maintenance
OBA	= Output-Based Aid
ONE	= Office National de l'Electricité (National Electricity Board)
ONEP	= Office National de l'Eau Potable (National Potable Water Board)
ORMVA	= Office Régional de Mise en Valeur Agricole (Regional Board of Agricultural Development)
PAGER	= Programme d'Approvisionnement Groupé en Eau Potable des Populations Rurales (Rural Water Supply Program)
PPE	Participation de Premier Etablissement – Infrastructure Participation Fee: i.e. new customers contribution to infrastructure development costs
PPP GNI	= Purchasing Power Parity Gross National Income

PSP = Private Sector Participation
RADEEC = Régie Autonome de Distribution de Settat
RADEEF = Régie Autonome de Distribution d'Eau et d'Electicité de Fès
RADEEJ = Régie Autonome de Distribution d'El Jadida
RADEEL = Régie Autonome de Distribution de Larache
RADEEM = Régie Autonome de Distribution de Meknès
RADEEMA = Régie Autonome de Distribution de Marrakech
RADEEN = Régie Autonome de Distribution de Nador
RADEEO = Régie Autonome de Distribution d'Oujda
RADEES = Régie Autonome de Distribution de Safi
RADEET = Régie Autonome de Distribution de Beni Mellal
RADEETA = Régie Autonome de Distribution de Taza
RAK = Régie Autonome de Distribution de Kenitra
RAMSA = Régie Autonome de Distribution d'Agadir
REDAL = Concessionaire consortium for Greater Rabat
UNDP = United Nations Development Program
VAT = Value Added Tax
WHO = World Health Organization

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EXECUTIVE SUMMARY

1. ***Purpose.*** This report is a diagnostic of infrastructure needs and services in Morocco's water supply and sanitation sector ("the water sector") in both urban and rural areas. It provides an overview of the economic context, and of the sector's organization, institutional and regulatory frameworks, performance, services to the poor, and investment needs. While this diagnostic hints at a range of reform options in specific areas (e.g., tariff structures, contractual and economic regulatory tools), a full discussion of a coherent and consolidated reform path exceeds the scope of this analysis. Options and recommendations for reform are the subject of ongoing policy dialogue with the Government of Morocco, and will be presented in detail in separate documents due for later publication.

2. ***Ambitious sector objectives***. The Government of Morocco (GOM) has been highly successful in mobilizing scarce water resources and developing reliable irrigation and urban water supply services. In 1995, the focus of water sector policies shifted to demand management, resource protection, and expansion of service in rural areas. As part of its agenda to promote economic growth, improve access to services, and control environmental degradation, GOM has set the following objectives:

- *Urban water supply:* increase access to potable water from 98 percent of the population today to 100 percent by 2008, and reduce non-revenue water from an average of 34 percent to less than 20 percent;
- *Rural water supply:* increase access to potable water from 50 percent in 2002 to 92 percent by 2007;
- *Pollution control:* increase treatment of wastewater loads from 7 percent in 2004 to 60 percent by 2010, and to 80 percent by 2015;
- In addition to these goals, GOM aims to improve water and sanitation access for the poor.

3. ***Financing bottlenecks and sector inefficiencies.*** To achieve the above objectives, sector agencies estimate that about MAD 30.7 billion (US$3.3 billion) will need to be invested between 2004 and 2007 alone. This would double the level of investment over the previous four years, and raises serious questions as to the feasibility and sustainability of the programs required to meet these objectives. The diagnostic that follows reveals that Morocco's water sector will be unable to finance these programs, and that addressing significant policy, regulatory, operational, institutional, and allocation inefficiencies is a prerequisite for achieving the level of self-financing and performance implied in the Government's sector objectives.

4. ***Generally adequate utility service.*** Moroccan cities have continuous water supply of satisfactory quality. Sanitation operations, however, are substandard, with an estimated 30 to 50 percent of capacity lost to clogging and frequent localized sewer overflows. There are three main categories of operators: Providers include 4 private concessionaires along the coast (38 percent of urban customers), 13 municipally owned autonomous *Régies* in large to medium cities (31 percent), and the National Potable Water Board (*Office national de l'eau potable* – ONEP) (28 percent). ONEP is the central actor in the water supply sector, responsible for 80 percent of all

bulk potable water production, and for distribution in secondary towns and in rural areas. ONEP is also mandated to ensure sanitation and develop wastewater treatment in the towns it serves. The accelerated introduction of sewage treatment in Morocco is expected to represent a significant operational challenge for local utilities.

5. ***Financial sustainability of providers at risk.*** Financial performance is difficult to assess due to internal cost allocations within the water, sanitation, and power activities of multi-sector utilities, and to general limitations in financial reporting and transparency. Our assessment, however, reveals important demand trends over the past decade, which will affect the future revenues and self-financing capacity of all operators. These include (a) a slowing growth of urban demand (1.7 percent annual average), and subsequent stagnation of ONEP's bulk water sales; and (b) a steep increase in customer numbers (+7.6 percent annual growth), due in part to the conversion of collective connections into individual connections, resulting in 40 to 50 percent in consumers in the lowest (generally loss-making) tariff block level. Water distribution operations are generally in deficit, with water sales seldom covering bulk water purchase and labor costs, let alone other costs and depreciation. A natural consequence is usually inadequate maintenance and asset management. As for ONEP, it no longer receives any direct subsidy from the central Government budget, except from funds allocated to the rural water supply program (PAGER - *Programme d'approvisionnement groupé en eau potable des populations rurales*). The higher cost of ONEP's small-scale and dispersed operations, as well as the cost of developing rural water supply are nowadays mostly compensated by "solidarity" and "PAGER" surcharges (intra-sector transfers). With the expansion of service to smaller centers and rural areas, and the stagnation of sales and surcharge revenue, ONEP's cost recovery may become increasingly difficult. Future wastewater treatment costs will furthermore challenge the sustainability of sanitation activities for all operators.

6. ***Policy inefficiencies.*** The highly fragmented institutional framework has hindered the formulation of a comprehensive sector-wide vision and the establishment of coherent policy objectives. This has led to some inefficiencies in the allocation of funding for capital investments, and misalignment between new sector priorities and infrastructure investment. In an effort to enhance coordination among the several policy stakeholders in the water sector, a new ministry responsible for water management was created in the fall of 2002 – the *Ministère de l'aménagement du territoire, de l'eau et de l'environnement* (MATEE). Other key policy and regulatory roles in the water sector pertain to the Ministry of Interior, the Ministry of Agriculture, the Ministry of General and Economic Affairs, and the Ministry of Finance. Coordination of their multiple roles in policy definition and application could be improved in order to achieve optimal allocation of water resources and funds.

7. ***Regulatory weaknesses.*** Morocco's regulatory framework is incomplete and inconsistent, with different rules for each of the three operator categories. At present, no single agency fulfills a comprehensive regulatory role. More structured and uniform legal and contractual rules, strengthened capacity of staff, and subsector regulators are needed for increased transparency, accountability, and competition among operators, which would ultimately lead to increased sector efficiency. Current incentives to improve performance (tariff setting, *péréquations,* contracts,..) , are inadequate and require improvement to better reward operational efficiencies and optimal investment strategies.

8. ***Ineffective tariff structures and subsidy policies.*** A unified block tariff structure applies to all retail water sales, with tariff levels varying locally. Not only are tariffs generally insufficient to cover operating and depreciation costs, but their subsidized components are not effectively benefiting the poor. Furthermore, the equity and effectiveness of surcharges applied to urban

tariffs, to subsidize ONEP's distribution, rural water supply, and sanitation activities, are questionable. There is, nevertheless, room to increase tariff levels, since household surveys indicate that the present cost of water and sanitation services is well within the affordable range, even for low-income households.

9. ***Barriers to access by the poor.*** Morocco's poor are concentrated in rural areas (67 percent), as well as in precarious urban slums, medinas (oldest sections of the city), and peri-urban neighborhoods (33 percent). Non-connected populations in poor neighborhoods rely on standpipes, wells, or informal vendors, who often charge 10 times the price of utility water. The *Régies* and concessions have developed successful "social connections" – installment payment facilities to connect low-income households in served areas – and have found that the urban poor, once connected, will diligently pay for utility service. Other innovative approaches are needed to address the urgent needs of unserved neighborhoods.

10. ***Sustainability of the rural water supply program (PAGER).*** Developing sustainable service options for the rural population is a more difficult challenge. ONEP's preferred approach for serving villages – lateral pipelines connected to its regional transmission or distribution mains – is technically sound and efficient, but may not always be the most cost-effective way to meet local demand. As coverage rapidly expands to more disperse rural areas, the sustainability of ONEP's corresponding operation and maintenance (O&M) and renewal responsibilities is doubtful, as is that of ONEP's local counterparts (users' associations, communes, small private operators). Ultimately, the accelerated pace of PAGER program may also be inconsistent with proven methodologies for introducing sustainable infrastructure in rural areas.

11. ***Insufficient, ineffective financing mechanisms.*** The main financing mechanisms for public providers (for ONEP, surcharges; for *Régies*, access fees for new customers) are inefficient and introduce distortions such as:

- Insufficient incentives to improve operating efficiency, and particularly to reduce non-revenue water;
- Lack of adequate programs to provide individual connections to the urban poor;
- Lack of financing to meet the country's vast sanitation/pollution control infrastructure needs;
- Unequal contributions from small towns and rural customers, on the one hand, and from medium/large city customers and the urban poor on the other.

Even combined with steep tariff increases, the sector should not be able to internally generate enough resources to fill the financing gap, assessed at MAD 7.2 billion for ONEP and MAD 2.1 billion for the *Régies* in the 2004-2007 period alone.

12. ***Need for sector reforms and better phased objectives.*** The efficiency gains required to meet the Government's goals depend on implementation of a comprehensive sector reform program, including enhanced regulatory mechanisms and capacities; improved tariff policies; better-targeted subsidies; and institutional reforms and capacity building to strengthen public operators, promote competition, and attract private sector financing. Because of broad positive externalities, pollution control investments could also justify an increase of recently established but very modest direct central government subsidies to the sector. Yet such measures are likely to be insufficient to realize the Government's short-term objectives. Even with considerable commitment and political support, implementing a sector reform program and reaping its benefits will take time, given the large number of ministries and stakeholders involved, and the sensitive nature of the actions involved. Thus the Government may need to revise its objectives and clarify its priorities.

13. ***Opportunities for World Bank Group assistance to the sector.*** To assist the Government in addressing these challenges and achieving its goals for the sector, the World Bank Group could provide support, upon the Government's request, in the areas listed below, using its full range of products (lending, with or without Government guarantees; technical assistance; capacity building; and guarantees to private investors).

- ***Assistance in implementing sector reforms*** through a combination of analytical work, technical assistance, and possibly sector adjustment lending. Options and recommendations for reform are still the subject of ongoing policy dialogue with the Government.
- ***Technical assistance to strengthen existing institutions or support the establishment of new ones***, in the areas of: (a) economic regulation and reporting requirements; (b) demand management and non-revenue water reduction; (c) utility management, with emphasis on financial planning, customer service, and collections.
- ***Support for rural water supply and sanitation programs,*** consistent with the Government's poverty reduction priorities, to improve the sustainability and financial viability of current technical and management approaches.
- ***Integrated water quality management and pollution control.*** In the context of Morocco's towering pollution control challenge, bank lending may address the need to: (a) jump-start river basin agency operations, to remedy urgent point-source contamination by large urban dischargers (e.g., in Sebou basin); (ii) develop sustainable sanitation and pollution control models for ONEP and the *Régies*, including models for the overdue development of water reuse for agricultural, industrial, and groundwater recharge applications; and (c) rapidly develop skills for wastewater treatment works management and operation.
- ***Increasing access to water and sanitation in slums and peri-urban neighborhoods.*** In collaboration with urban habitat upgrade programs, lending could help develop classic and innovative approaches to service delivery for the urban poor in slums, traditional neighborhoods, and peripheral illegal developments. Service offerings, including "social connections," should be based on actual demand and appropriate technology.
- ***Piloting innovative contractual and subsidy mechanisms*** to involve the local and international private sector in lower-return market segments, such as the sewerage sector, through Output-based Aid (OBA) contracts.

PART A : WATER AND SANITATION SECTOR IN MOROCCO: A SNAPSHOT

1. WATER AND THE SOCIAL AGENDA

14. Morocco is on track to achieve the Millennium Development Goals for water and sanitation. As part of its ambitious social agenda, the Government has set challenging national objectives for urban water supply (maintain 100 percent access to potable water, reduce non-revenue water from 34 percent to 20 percent by 2008); rural water supply (increase rural access to potable water from an estimated 50 percent in 2002 to 92 percent by 2007); and pollution control (increase the volume of wastewater treated from 7 percent of the total generated to 80 percent by 2015).

15. As of 2000, about 82 percent of Moroccans have access to safe water supply; however, this average masks considerable differences in service coverage between urban and rural areas. Urban areas have almost universal access to an improved water source, as opposed to only 58 percent of households in rural areas. Also, as of 2000, nearly 95 percent of the urban population and 42 percent of the rural population have access to improved sanitation. However, sewerage networks remain underdeveloped, and widespread disposal of untreated wastewater continues to pollute water bodies and endanger public health.

2. SECTOR FRAMEWORK

16. Municipalities are responsible for local water and sanitation service. In cities and larger towns however, water supply has long been entrusted mostly to specialized public operators (Régies, ONEP). By contrast, with the exception of the biggest cities, municipalities have tended to remain directly in charge of sewerage through non-professional and underfunded municipal departments. Specialized public operators include 13 municipally-owned autonomous *Régies* , most of which provide water, sanitation and electricity distribution service. A national public operator, ONEP *(Office National de l'Eau Potable)*, is an autonomous entity, which produces 80 percent of the potable water in the country, and ensures retail distribution in about 300 medium to small towns. After the recent amendment of its Law, and at the request of local governments—ONEP is also gradually taking over sewerage services in the urban centers where it already provides water service. Since the return of private sector partnerships to Morocco in 1997, four private multi-utility concessionaires also serve the big coastal cities of Casablanca, Rabat, Tangiers, and Tetouan.

17. Beyond issues affecting providers, the sector is characterized by a complex and fragmented institutional framework, which has hindered the formulation of a comprehensive sector-wide vision and the establishment of coherent policy objectives. To enhance coordination in the sector, the *Ministère de l'aménagement du territoire, de l'eau et de l'environnement* (MATEE) was created in 2002 to oversee the management and development of water resources for all uses, including through dam construction and operation.

18. The creation of MATEE was part of a reform effort that began in the mid-1990s, when—after decades of traditional supply management and water resources development—the Government began to focus on making more effective use of available water resources, through more efficient demand management and resource protection. Institutional reforms since that time have included:

- Promulgation of a new Water Law (in 1995), creating river basin agencies responsible for integrated water resource management;
- Setting of ambitious national goals for demand management, sanitation, pollution control, and rural water supply;
- Opening of Morocco's urban water sector to private sector participation, in the form of long-term, multi-sector concession contracts;
- Creation of MATEE (in 2002);
- Gradual transfer of sewerage services from local governments to specialized operators—the *Régies* (which serve 31 percent of urban customers), private concessionaires (38 percent), and ONEP (28 percent);
- Amendment of the ONEP Law (in 2003) to include sewerage services and pollution control in ONEP's mandate (which raised concerns about the long-term efficiency and accountability of this quasi-monopoly across multiple subsectors;
- Introduction of sewerage tariffs (*redevance d'assainissement*) based on volumetric consumption of potable water.

19. These reforms improved the institutional environment in the sector, but did not particularly strengthen the sector's regulatory framework, which remains incomplete and inconsistent, with different rules for each of the three operator categories—ONEP, the *Régies*, and the concessions. No single agency has a comprehensive regulatory role; rather, the responsibility is shared by the following main bodies:

- The Directorate of Public Utilities and Concessions (DRSC) of the Ministry of the Interior, which monitors the performance of *Régies* and concessions;
- The Directorate of Public Corporations and Privatization of the Ministry of Finance, which oversees the fiscal aspects of public utility operations, and the contracting of concessions; and
- The Interdepartmental Commission on Prices, which approve proposals for tariff increases.
- Finally, river basin agencies are also expected to become important regulatory agents for the better management and restoration of ambient water resources.

20. The regulation of public providers lacks contractual and economic tools, and, arguably, independence. For private providers, regulation by contract is reportedly largely consensual and effective because of the service-at-all-cost focus of contract administrators, which encourages responsive service improvements and effective infrastructure decisions. However, more empowered and financially mature contract administration structures may be needed to ensure transparency, accountability, and competition in the sector, which would in turn attract more private investment.

3. SUPPLY AND DEMAND TRENDS

21. Over the past ten years, individual connection rates in urban areas have grown to 88 percent for potable water, and up to 80 percent for sewerage. In rural areas, access to potable water supply has also improved, from 14 percent in 1994 to 58 percent in 2002. During this period, the sector has also experienced:

- Slow growth in urban demand volumes (1.7 percent annual average, versus 7 percent in the preceding decade), and as a result, stagnation in ONEP's bulk water sales;
- A steep increase in customer numbers (7.6 percent annual growth), resulting from urban growth and large-scale conversion from collective to individual connections (to mitigate undesirable impacts of the increasing-block tariff structure);
- A growth in low-volume consumers, billed at the most subsidized and unsustainable tariff block level;
- The successful launch of four concessions in Morocco's largest cities, which are all producing substantial improvements in service quality, efficiency, and infrastructure.
- Regular tariffs increases for private but not for public providers;
- Substitution of Government subsidies to ONEP by transfers (through surcharges) from *Régie* and concession customers;

4. TARIFF STRUCTURES AND THE SUSTAINABILITY OF PROVIDERS

22. A unified increasing-block tariff structure applies to all retail urban water sales, with tariff levels varying locally. Tariff adjustment mechanisms, which vary by type of operator, leave the operations of the *Régies* largely unsustainable, as the tariffs are inadequate to cover operating and depreciation costs—and induce deferred maintenance, upgrading and renewal of assets. By comparison, ONEP has for the moment healthy cash flows, due to diversified and periodically adjusted revenues, even though its operations are more dispersed. However, the equity and efficiency of surcharges to subsidize ONEP's distribution, rural water supply, and possibly, sanitation activities are questionable. Private concessions are assumed to be sustainable, perhaps due in part to their priority investments in non-revenue water reduction. However, accurate information is scarce as concessionaires breach contract reporting requirements.

5. BARRIERS TO ACCESS BY THE POOR

23. The Government is concerned about affordability of basic water and sanitation services, although its equity and poverty targeting objectives are not clearly spelled out. The highly subsidized social tariff for the first block of consumption, and the marginally subsidized social connections, aim at ensuring affordability for the poor, but have not been highly effective in helping the poor. Because of high hook-up fees, many households in urban areas still cannot afford an individual connection. In turn, usage of collective connections causes poor households to pay water in the higher, unsubsidized tariff brackets.

24. The poor are concentrated in rural areas (67 percent); and in precarious urban slums, traditional medinas, and peri-urban neighborhoods (33 percent). Non-connected populations rely on standpipes, wells, or informal vendors, who often charge 10 times the price of utility water. The *Régies*, ONEP, and the private concessionaires have developed social connection programs (installment payment facilities) for households located in served areas. Experience across the board is that once connected, 98 percent of the urban poor will diligently pay for utility service. Social connection programs are in high demand but are nevertheless insufficient. Innovative approaches are needed to offer more competitive services tailored to urban poor habitats,

demands, and constraints, especially so in unserved peri-urban areas, such as currently proposed in Casablanca.

25. For the rural poor, ONEP has been serving villages from lateral pipelines connected to its regional transmission and distribution mains. This approach has been economically sound for villages located within a few kilometers of ONEP's pipelines, but may prove prohibitive if longer distances or large flows were involved, or if additional water treatment plants were required. ONEP is therefore rethinking its approach to rural service provision, and will proceed in stages to first implement least-cost schemes wherever possible, and then assess alternatives based on local water sources in the remaining unserved areas. ONEP has requested Bank assistance to reassess its service models, facilitate the development of house connections, and generate further involvement of the private sector and rural communities in the operation and maintenance of water supply facilities.

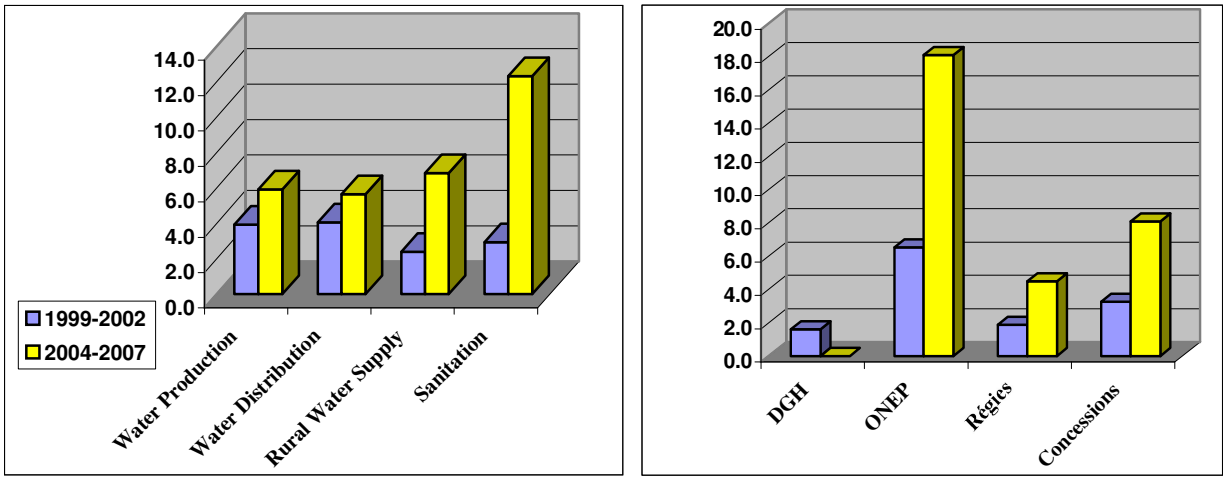
6. INVESTMENT REQUIREMENTS AND FINANCING MECHANISMS

26. In the absence of substantial central Government subsidies for rural water supply and wastewater treatment, sector investment requirements could threaten the sustainability of current institutional and financing models. The Government's goal of reducing the fiscal deficit from 6 percent to 3 percent by 2007 will further constrain overall public expenditures in the sector. Increasing the efficiency of public financing in the water sector, from both the central budget and the cash flow of public operators, is therefore an explicit Government objective.

27. An estimated MAD 30.7 billion—double the investment of the previous four years—must be invested between 2004 and 2007 to remain on track for achieving the Government's goals for service coverage. This raises serious questions as to the feasibility and sustainability of the planned programs, which depend largely on the self-financing mechanisms of ONEP and the *Régies* (which for ONEP's are dependent on surcharges, while the *Régies*' heavily rely on network access fees). The acceleration of investment is risky in many regards: It relies heavily on ONEP's implementation capacity, including in areas where ONEP's experience is limited, such as rural water supply and sanitation, and pollution control. Such a concentrated infrastructure program may also strain the capacity of local industry, leading to non-competitive program costs and poor responsiveness to real demand.

28. Even under the most optimistic assumptions about efficiency gains and revenue growth, the self-financing mechanisms available to ONEP and the *Régies* are inadequate, and the financing gaps with regard to investment plans to meet the MDGs by 2014 are estimated at MAD 7.2 billion and MAD 13.4 billion, respectively. Closing these gaps will require both an increase in central government subsidies and an improvement in the sector's self-financing capacity, through tariff increases, cost reductions and greater access to local capital markets. Current financing mechanisms in the case of public providers could be improved to address shortcomings such as insufficient incentives for operating efficiencies, and unequal contributions by ONEP customers on one hand and Régies and concession customers on the other hand.

Figure 1: Investment needs for 2004-2007, by subsector and type of operator (MAD billion)



Source: World Bank estimates.

PART B : DIAGNOSTIC OF WATER SUPPLY AND SANITATION SECTOR PERFORMANCE

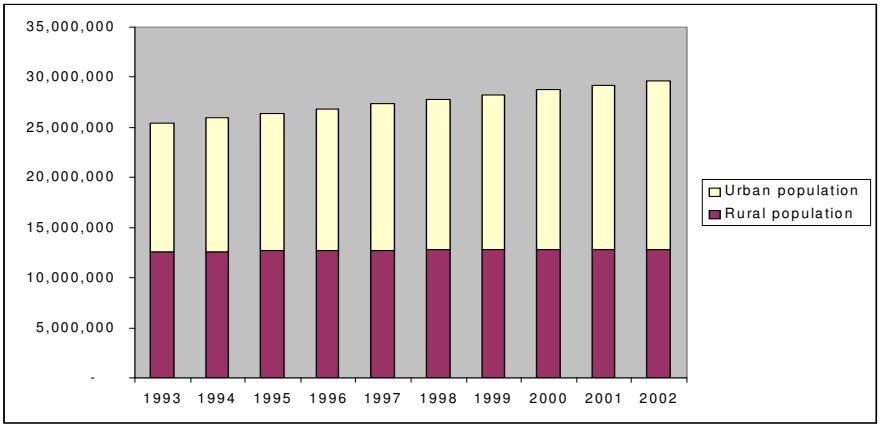
I GENERAL ECONOMIC CONTEXT RELEVANT TO THE SECTOR

I.1 Sociopolitical and Macroeconomic Context

29. **Morocco is a middle-income country undergoing a socioeconomic transformation…** It is a constitutional monarchy situated in the upper northwest of Africa, with a total population of 30.1 million and a GDP per capita of about US$1,483 in 2003 (in current US dollars). Past centralist and interventionist policies have resulted in significant political and economic concentration of power and property. However, the country has been departing from that system since the 1980s, first through economic liberalization, and later through ongoing democratization, decentralization, and modernization, which have gained momentum since Mohammed VI's accession to the throne in July 1999.

30. **… in the context of a growing population and rapidly increasing urbanization.** Morocco's population grew at an average annual rate of 1.7 percent between 1995 and 2001, down from 2.7 percent in the 1980s. Rural areas were home to 42.5 percent of the population in 2003, a relative high proportion, but urbanization is progressing quickly. The urban population has more than tripled in the last 30 years, reaching an estimated 57.5 percent of the total in 2003. A majority of the poor, 64 percent, are still concentrated in rural areas. Growth has been limited to 3 percent over the past five years.

Figure 2: Demographic and urbanization trends of the 1993-2002 decade



31. **Morocco maintained economic stability but achieved sluggish growth in the 1990s...** Morocco's performance has been satisfactory with regard to inflation (less than 3 percent since 1996), balance of payments, and foreign debt, which has been consistently reduced since the mid-1980s, when debt pressures resulted in a turn toward economic liberalization. The 1983-91 period was characterized by economic stabilization and structural adjustment reforms. Favored by propitious weather, agricultural output increased substantially; which enabled Morocco to achieve remarkable stabilization results with growth, income expansion, and poverty reduction. The situation was reversed in the 1990s, largely because of repeated severe droughts, which resulted in a fall in real per capita GDP growth from an annual average of 2.1 percent over 1986-91 to 0.1 percent between 1991 and 1998.[1] Although agriculture accounts for only about 14 percent of GDP,[2] its large share of total employment (43 percent[3] of the labor force) makes it a central factor in influencing domestic demand and thus overall GDP performance. In addition, the growth rate in services, industry, and manufacturing dropped from an annual average of 4.2 percent in the 1980s to 2.8 percent in 2002. Appendix 2 provides additional economic indicators.

32. **…which led to a failure to reduce unemployment and poverty.** The low growth rate was insufficient to meet the rising demand for jobs by a youthful population (31 percent under 15 years of age in 2002, and an unemployment rate of 18.3). The growth rate was also insufficient to reduce poverty. Real per capita GDP, in fact, stagnated in the 1990s, and the incidence of poverty grew from 13 percent of the total population (3.4 million people) in 1990-91 to 19 percent (5.3 million) in 1998-99. Rural areas were most affected, with 27 percent of rural households ranking among the poor, versus 12 percent in urban areas.

33. **The Government has invested significantly in human development since the mid-1990s…** Morocco has made considerable investments toward improving access to basic social

[1] *Source:* World Bank (2000), *Sources of Growth* (May).
[2] *Source:* World Bank (2004a), *Morocco Economic Monitoring* (Spring).
[3] *Source:* Economist Intelligence Unit (2004), *Country Profile.*

services. As a result, most social indicators improved in the 1990s, including adult illiteracy, primary enrollment, infant mortality, life expectancy, and access to electricity and potable water.

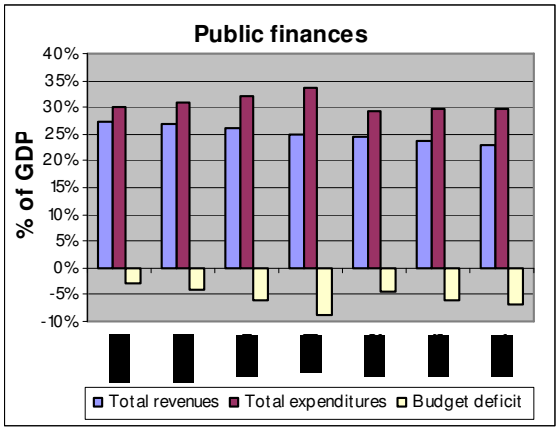
34. **…but the urban/rural divide persists.** Social indicators remain considerably lower in rural areas – literacy rates, for example, are 25 percent in rural areas, compared to 63 percent in urban areas – and years of under-investment, high poverty rates, and remoteness make it difficult to close the gap. Continued efforts to re-balance the urban/rural divide, including in water and sanitation services (see section 2), are part of the Government's social agenda.

35. **Real GDP growth has accelerated in recent years.** As the droughts of the 90s receded, real GDP growth accelerated to 6.3 percent in 2001, dipped to 3.2 percent in 2002, and rose again to 5.5 percent in 2003. Prospects for 2004 are promising, but GDP will probably grow at a slower rate than in 2003, below the 6 percent annual average required to reduce unemployment and meet the Millennium Development Goal for poverty reduction.

36. **Improving access to basic infrastructure services and addressing housing shortages are high priorities for the Government…** In the current delicate geopolitical situation in the Middle East and North Africa, and following a strong showing of the Islamist parties in the September 2002 parliamentary elections (considered the first truly free elections of the Kingdom's history), the Government's priorities are to reduce unemployment and raise living standards through accelerated economic growth. The shock of the Casablanca suicide bombings in May 2003 further strengthened the determination of Moroccan policymakers to improve essential services to rural areas and the urban poor – not only water supply and sanitation, but also health care, education, housing, and other basic infrastructure—in order to eliminate the conditions in which Islamist radicalism thrives.

37. **…but Central Government financing of water supply and sanitation capital investments will be limited by the deficit reduction imperative.** Despite considerable privatization receipts, Morocco's total public debt remained at around 74 percent of GDP[4] in 1998-2002, due mainly to large fiscal deficits. Budget deficits[5] have grown to about 6 percent of GDP since 2000, as a result of increased current expenditure, particularly a rising wage bill. This deficit level, coupled with a decrease in public savings, is unsustainable. The Government has set a goal of reducing the deficit to 3 percent by 2007, but this will constrain overall public expenditures in the water sector. Containment of the sector's current expenditures, and maximization of self-financing of capital investments, are thus guiding principles for the Government's water sector policies. Increasing the efficiency of public financing in the water sector, whether from the central budget or the cash flow of public operators, is also an explicit Government objective.

Figure 3: Government budget deficit

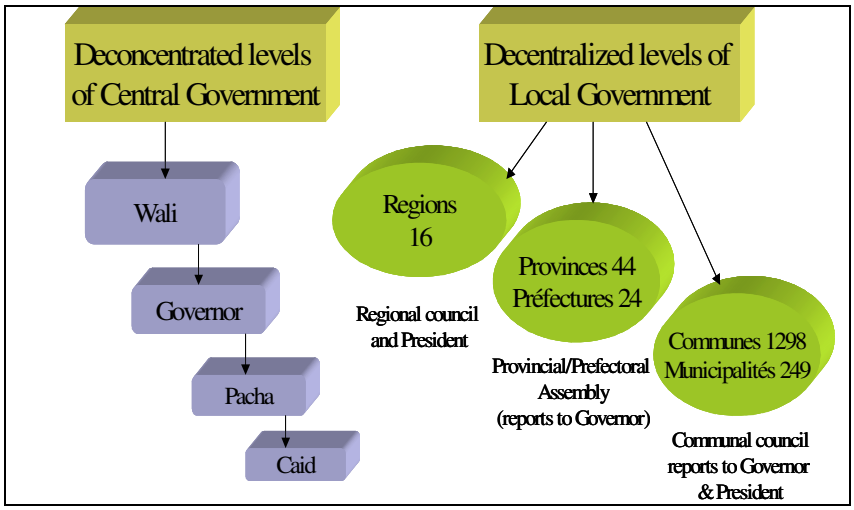


[4] The World Bank's *Morocco Economic Monitoring Report* (World Bank 2004a) estimated domestic debt at 49.7 percent of GDP and external debt at 23 percent of GDP for 2002.

[5] Including Hassan II Fund.

38. **The pace of reform has accelerated in recent years.** Important structural reforms are underway. These include privatization; more flexible labor regulations; a new Banking Law; modernization of the capital market legal framework; and public administration and decentralization reforms to raise accountability and shift responsibilities for sector operations from appointed Central Government officials to local governments (see Figure 4). Moreover, further liberalization and integration into the world economy[6] will provide opportunities for greater economic diversification and sustainable, private sector-led growth and job creation. Morocco's massive *mise à niveau*, or industrial modernization program, is helping to overcome the volatility associated with dependence on the agriculture sector. On the social front, the reform of the *moudawana*, or Family Code, will advance gender equality. Although vested interests and bureaucratic inertia may hinder the implementation of the most ambitious reforms, such as decentralization, many of the reforms will affect the organization and performance of the water sector over the next decade.

Figure 4: Territorial levels of State representation and elected Local Governments



Source: Chikhaoui, 2000, Dimension de la décentralisation au Maroc.

39. **The water and energy sectors together contribute 5 percent to Morocco's GDP, and investment in water supply and sanitation amounted to 3.3 percent of gross fixed investment in 2002**. The water and sanitation sector benefits from donor financing, particularly the large amounts of cheap financing from the EU. Private operators and ONEP have successfully leveraged their cash flow from operations by mobilizing debt from the local capital market for their capital expenditure program at very competitive terms, thus showing an untapped potential for sector development. Public water and sewerage utilities, however, lack access to local finance (bank lending, equity markets, other sources of funds) mainly because of their weak financial position.

I.2 The Status of Water Resources in Morocco

40. **Water demand is increasing, and resources are becoming more scarce.** Water resources in Morocco are rare and unevenly distributed. With renewable freshwater availability at only 700 m^3/person/year, Morocco is well below UNDP's scarcity criterion of 1,000 m^3/person/year.[7] Moreover, water is becoming scarcer due to demographic and economic growth pressures, limited

[6] Morocco's Association Agreement with the EU, its main trading partner, was signed in 1996 and implemented in 2000. The agreement leads to a Free Trade Agreement after the transition period ending in 2012. France and Spain are Morocco's main trading partners. Morocco has also recently concluded a free trade agreement with the United States.

[7] Neighboring Algeria and Tunisia have 225 and 425 m^3/person/year, respectively.

potential for increased resource mobilization, and periodic long droughts. By 2020, 35 percent of the population will be below the absolute scarcity threshold of 500 m^3/person/year. Annual precipitation patterns are irregular. Normal precipitation can range from 750 mm/year in the Mediterranean regions to less than 100 mm/year in the Saharan regions. In a drought year, it can be one-third that amount. About 20 billion m^3 of freshwater resources[8] are available for mobilization, of which 16 billion m^3 as surface water and 4 billion m^3 as groundwater (see Figure 5).[9]

41. **The potential for more resource development is limited.** Morocco has achieved remarkable success in mobilizing its scarce water resources. Close to 90 percent of economically accessible resources have already been developed through: (a) dams and inter-annual storage reservoirs; and (b) a dense grid of groundwater wells. As of 2001, developed resources amounted to a maximum theoretical capacity of 17.5 billion m^3, of which 16 billion m^3 are stored in 103 reservoirs and 1.5 billion m^3 accessed through aquifer pumping.[10] However, actual reservoir storage is about 10.8 billion m^3 (see Figure 5), with releases averaging 3.5 billion m^3/year over the past decade. Following repeated droughts over the past 20 years, the number of wells has increased significantly, and based on observed water table drops, pumped volumes often largely exceed aquifer recharge, thus inducing saline intrusion along coast lines.

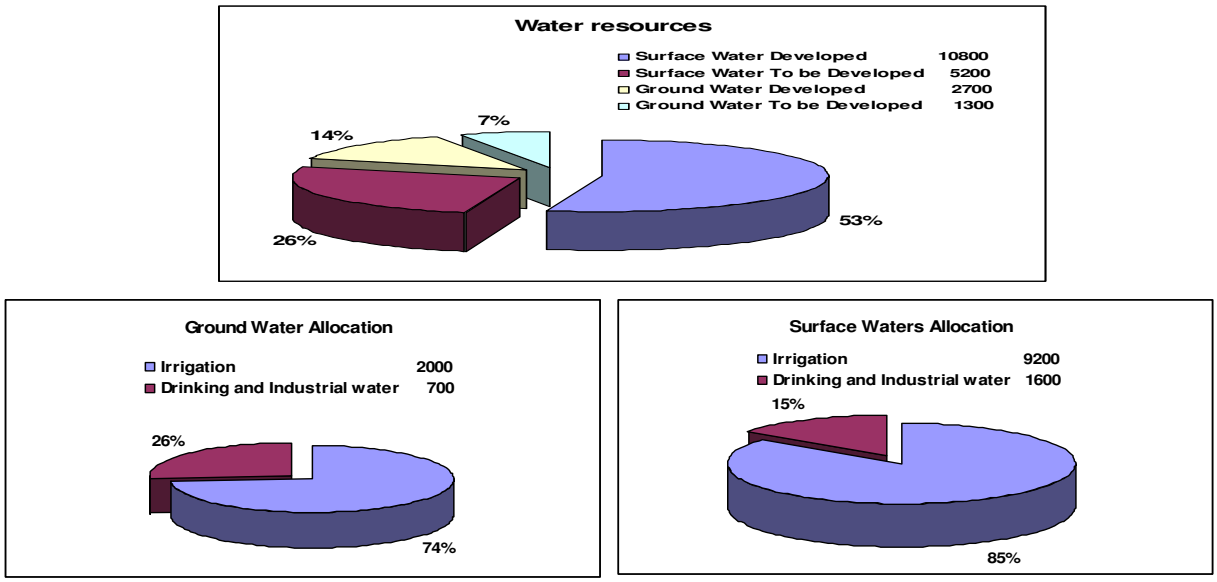
42. **Agriculture's dominant water usage.** Irrigated agriculture is an essential pillar of economic and social development in Morocco. Morocco's 1.4 million hectares of irrigated cultures consume, on average, 85 percent of available water resources (as low as 60 to 70 percent in a dry year), compared to 12 percent and 3 percent of resources used for public water supply and industry, respectively. The National Irrigation Plan aims at raising the efficiency of agricultural water use, through upgraded infrastructure, improved practices, and lower-demand crops.

[8] Groupe Thématique Eau de l'Union Européenne (2003); Observatoire National de l'Environnement (1996); El Badraoui Moulay Hassen (2001).

[9] Efforts are being made to reevaluate Morocco's hydrologic parameters, since recurrent droughts over the past 20 years seem to indicate that historical averages may now overestimate actual resources by about 20 percent.

[10] In 1997, resources were estimated at 17.2 billion m^3, with 92 reservoirs accounting for 14.5 billion m^3, and boreholes and dugwells allowing additional annual withdrawals of 2.7 billion m^3. See PNE Study (2002).

Figure 5: Allocation of mobilized water resources (million m³)



Source: Direction Générale de l'Hydraulique (2004).

43. **Excessive withdrawals and pollution threaten water supply sources.** As shown in Figure 5, water supply consumes about 15 percent of mobilized surface water resources (1.6 billion m^3), and about 26 percent of tapped groundwater resources (0.7 billion m^3). In terms of pollution, coastal and surface water resources are being polluted by untreated municipal wastewater (only 5 to 7 percent of urban sewage is treated), industrial effluents (phosphorous, organic loads from food industry, heavy metals), and diffuse agricultural sources (nitrates, pesticides). The Sebou basin is among the most contaminated. Soil erosion is causing water turbidity and accelerating reservoir sedimentation; and seepage of phyto-sanitary and industrial compounds, as well as saline intrusion, is polluting aquifers. The cost of environmental degradation was estimated at MAD 13 billion/year, or more than 3.5 percent of GDP, in 2000.[11] Of this, water pollution accounted for MAD 4.3 billion/year, or 1.2 percent of GDP.

I.3 Government Sector Goals and Relevant Water Policies

44. **The 1995 Water Law marked a paradigm shift in the Government's water policies, from supply to demand management**. With the new law, the emphasis changed from heavy investments in water resources development, which was almost complete, to better water use efficiency, resource allocation practices, and protection of water quality. This modern Law recognizes water as an economic and social good. It establishes the demand management principles of "user pays" and "polluter pays," as well as river basin agencies for integrated water resources management. Implementation of the new Law is still incomplete, with actions still pending for: (a) reallocation of resources and responsibilities between former and newly created entities; and (b) strengthening coordination among the various ministries and sector operators.

45. **The Government's ambitious objectives for the sector are straining current financing models.** As part of its ambitious social agenda, the Government has set ambitious national objectives: (a) for urban areas, sustain 100 percent access to potable water, and reduce non-

[11] World Bank (2003a), *Environmental Degradation Cost Assessment.*

revenue water from 34 percent to 20 percent by 2008; (b) for rural areas, increase access to potable water from an estimated 50 percent in 2002 to 92 percent by 2007; and (c) for pollution control, increase wastewater treatment from current 7 percent of sewage flows, to achieve an 80 percent reduction of polluting loads by 2015. The corresponding investment needs are, however, threatening the sustainability of current institutional and financing models.

46. **In response to the need for new investment in the sector, the Government has:**

- *Mobilized national and international funding* to launch the ambitious Rural Water Supply Program (PAGER) in 1995;
- *Granted long-term, multi-service concession contracts to international private operators* to improve service and finance infrastructure in the largest cities. The Casablanca concession was awarded in 1997, followed by concessions in Rabat, Tanger, and Tetouan.
- *Introduced sewerage tariffs, and established a modest subsidy program for sewerage and sewage treatment,* to help overcome financing constraints.

47. To take Morocco's water sector to a level of efficiency and self-financing compatible with its objectives, the Government is considering options for consolidating and unbundling existing operators into a few regional water and sewerage utilities.[12] A tariff reform study is also underway.[13]

[12] McKinsey.
[13] Service Public 2000.

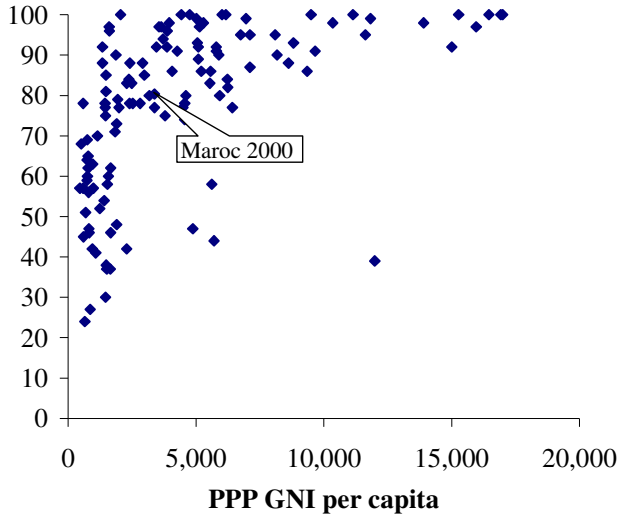
II ACCESS TO WATER SUPPLY AND SANITATION

II.1 General Diagnostic of Access

II.1.1. Good access to water, except in slums and rural areas

48. Access to potable water improved significantly in the past decade. According to estimates produced by the WHO/UNICEF Joint Monitoring Program (JPM), based on Household Survey data from 1987, 1992, and 1995, about 82 percent of the population had reasonable access to an "improved water supply source" in 2000[14] – higher than in many other countries. However, these figures mask significant differences in access between urban and rural areas. Nearly 100 percent of the urban population had access to good quality and reliable supply, as compared to only 58 percent of the rural population.

Figure 6: Percentage of the population with access to improved water in Morocco and other countries.



Source: World Development Indicators

49. The JMP report shows that the level of rural access has remained stable in percentage terms since 1990 These findings contradict official Government statistics from its rural water supply program, PAGER *(Programme d'approvisionnement groupé en eau potable des populations rurales),* which show that rural access to potable water increased from 14 percent in 1994 (a year before the program began) to some 50 percent in 2002. It is true that public water supply service has expanded considerably in rural areas since 1994; however, PAGER's highest estimates of coverage do not account for the fact that about 20 percent of rural water supply schemes may be out of service. The differences between the two sets of data can also be explained by the fact that the definition of "safe" sources of supply, considered by the Joint Monitoring Program, has been ignored or overlooked in the official Government statistics. The origin of the data also differs. Thee Government's estimates are based on data from the utilities/public sector providers, while JMP's are based on surveys, which are generally preferred because they reflect actual use by households, and not the mere availability of public facilities.

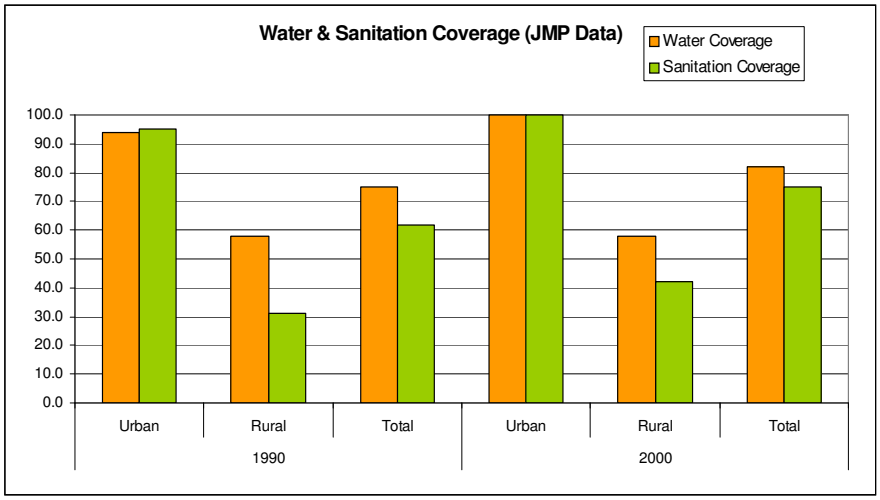
[14] The WHO/UNICEF Joint Monitoring Program report Moroccan National Household Standard of Living Surveys , in The *Global Water Supply and Assessment Report 2000* states that "improved water supply sources" include piped water, public tap, borehole or pump, protected well, protected spring or rainwater. This report also defines "reasonable access" as "the availability of 20 liters per capita per day at a distance no longer than 1,000 meters from the dwelling". These are the definitions usually retained for the Millennium Development Goals.

50. Further, the most recent Household Survey results (for 1998-99)[15] show that only 12 percent of the rural population used an individual connection or standpipe as their source for potable water at the time the survey was taken (when PAGER had been operating for only three years). That survey also showed that 78.4 percent of urban households had individual service connections, whereas those in poor or precarious habitats (urban or peri-urban slums, illegally constructed neighborhoods) typically got their water from communal standpipes.

II.1.2. Inadequate sanitation and lack of wastewater treatment

51. Most Moroccan cities, and medium to small towns, have had sewerage collection systems since the late 1970s, but coverage is more limited than for potable water service. On average, 80.4 percent of urban dwellers were connected to a sewerage system at the time the 1998-99 survey was taken (88.7 percent in large cities, 64.5 percent in small and medium towns), and 14.7 percent had adequate in situ facilities; thus only 4.9 percent lacked access to sanitation. In contrast, the JMP finds that only 42 percent of the rural population had access to improved sanitation facilities in 2000, and the Household Survey estimate is even lower, at 29.4 percent. On-site sanitation facilities are mostly self-supplied (see Table 5). All sources thus indicate that access to sanitation in rural areas is significantly lower than in urban centers. Yet urban sewerage collection networks are generally in poor condition, and sewerage service is completely lacking in the peri-urban areas of secondary urban centers. Slums scattered across the bigger metropolitan areas are also deprived of access to the sewerage collection network, reinforcing the health risks and poverty stigma in those neighborhoods. Furthermore, only about 5 to 7 percent of collected sewage is treated before being discharged into the environment.

Figure 7: Potable Water and Sanitation Access in Morocco, 1990 and 2000



Source: WHO/UNICEF Joint Monitoring Program

II.2 Difficulties in Reaching the Poor

[15] Source : Direction de la Statistique (1999). National Household Standard of Living Survey 1998/99 (i.e. *Enquête nationale sur les niveaux de vie des ménages 1998/1999*).

52. The Household Survey of 1998/99 confirms a strong correlation between poverty and lack of access to potable water. The reasons for lack of access fall into three main categories:

- *Distance from water mains*, mostly affecting the 67 percent of the poor living in rural villages and settlements; but also affecting the 33 percent of the poor living peri-urban neighborhoods and illegal developments, which are generally built at a significant distance from existing or planned distribution main routes;

- *Technical and/or legal impediments to establishing service*, including lack of access road for construction, lack of sanitation (a prerequisite for establishing water service), lack of property title, inability to establish effective meter reading and bill collection routes, and the transitory nature of residents; and

- *Unaffordable connection costs* (an average of MAD 2,000-5,000, or US$215-$530 for water in 2002; and MAD 8,000-15,000, or US$850-1,600 for sanitation), with property owners having no incentive to invest in service connection for transient, poor tenants.

53. From the perspective of the poor themselves, the two most important reasons for non-connection are cost and distance from a connection (Table 1).

Table 1: Rationale for non-connection to water distribution network (1998-99)

	Habitat				
percent of Households by reason claimed for no water supply connection	Large towns	Medium & small towns	Urban	Rural	Total
Too expensive	26,5	34,2	29,8	2,9	9,3
Not needed	1,7	2,7	2,2	0,9	1,2
No network in the vicinity of my community	33,2	47,8	39,5	94,6	82,0
Other	37,9	14,1	27,6	1,4	7,5
No answer	0,7	1,2	0,9	0,2	-
Total	100,0	100,0	100,0	100,0	100,0

Source: National Household Living Standards Survey, 1998-99.

II.2.1. Access Issues for the Urban Poor

Standpipes

54. For the urban poor, standpipe services is prevalent in all central neighborhoods, and is typically free for users, with bills going to local governments or communes. In rarer instances, standpipe management is entrusted to a *gardien/gérant*, who operates the faucet and charges users. Such free services are definitely pro-poor, but are increasingly unsustainable for operators, both in terms of wasted water (up to 40 percent[16]) and in terms of unpaid bills. Accordingly, operators are in favor of promoting individual connections as a means to eliminate standpipes.

[16] Estimate by Lydec (the Concessionaire Consortium for Greater Casablanca)

Social Connection Programs

55. Social connection programs subsidize individual water connections by providing a free or below-market loan to cover the cost of connection. Such programs rely on the operator's own resources, in the case of public utilities, and on the municipalities, in the case of private concessions, to advance the cost of connection into the *Fonds des Travaux* (Works Fund).[17] Customers repay the loan in installments over three to five years. Operators offering social connections typically accept on-site or self-provided sanitation and drainage solutions as sufficient to meet the sanitation and drainage pre-requisites for installation of the connection. As noted above, there also needs to be a main nearby, and the property must be suitable for a water line, which is not always the case in slums (see below).

56. Even with such programs, however, the poor pay more than their fair share for a connection, since connection fees are artificially high in order to compensate for inadequate water tariffs and tariff adjustment mechanisms. (see section 4 for a detailed discussion of tariffs).

Alternative Service Models

57. Alternative service models are needed for slums, traditional and peri-urban unzoned neighborhoods, where it is difficult to lay service mains, sewers, and drainage systems (Table 2). To address these challenges, Lydec, the Ministry of Habitat, and Casablanca community partners are attempting to develop low-cost, sustainable water service models that respond to customer demand for very basic service, based on the belief that poor customers will pay for better service. The Lydec model aims to reduce the installation cost for individual connections by reducing water losses and water theft. Other models focus on community involvement, lower-cost systems and materials (low-depth HPDE piping, low-cost condominial drainage and sanitation), and the use of local informal entrepreneurs for installation. Subdivision metering, with or without individual sub-metering, and reliance on a subdivision or "alley" representatives for bill payment have proved successful for electricity service, and will be relied on for water service.

Table 2: Habitat and service impediments for the urban poor

Habitat	Key features	Current service & issues
Slums	Central or peripheral shanty-towns, of potentially huge proportions (e.g. 60,000 families). Considered impermanent by zoning authorities.	Typically served by bordering standpipes, and water vendors. Occasionally feature makeshift drainage and sanitation piping. Access is too narrow and complex for penetration by classic network infrastructure.
Illegal developments (unzoned buildings)	Peripheral location, usually at significant distance form nearest water and sanitation infrastructure	Typically served by private wells and water vendors
Peri-urban villages and hamlets (douars),	Semi-rural habitat	Served by traditional wells, and water vendors.

[17] It appears that some municipalities no longer have the resources to advance to the Works Fund.

Traditional neighborhoods (medinas, casbahs)	Centrally located traditional neighborhoods, in general state of decay, with difficult access.	Usually served by public standpipes. Individual connections are technically feasible, but impaired by owners disinterest, and impermanence and limited resources of tenants.

II.2.2. Access Issues for the Rural Poor

Water and sanitation service issues for the rural poor are less well documented. While it is accepted that rural water supply infrastructure requires substantial subsidy, current rural water supply programs aim at ensuring that consumption revenues and tariffs (see section 4) are assessed locally to allow recovery of operation and maintenance costs.

58. Water supply access and service must be competitive to displace use of free proximity water sources, such as traditional wells or surface water streams. Demand surveys suggest that what rural households really want is the definitive service enhancement of an individual connection, rather than paying for a shared standpipe some distance from their home. The estimated cost impact and cost-sharing assumptions of the two options, are summarized in the table below (Table 3).

Table 3: Capital cost sharing assumptions

Type of Access	Household	ONEP	Commune	Total Cost
Standpipe	250	4,000	750	5,000
Individual Connection	2,500	5,000	2,500	10,000

Source: PAGER estimates for projects under preparation.

No information is yet available as to where such access costs and corresponding service costs are affordable for the rural poor. The results of the 1998/99 Household Survey with regard to such expense levels are summarized in appendix 6.

III INDUSTRY STRUCTURE

III.1 Supply Side

III.1.1. Modes of supply

59. **There are three main types of supply used by Moroccan water users: utilities, self-provision, and informal providers:**[18]

- *Utility provision (about 57 percent of households).* Public or private utilities providing potable water and sewage collection at the local, regional, or national level through modern infrastructure systems. Utility provision is the norm across urban areas. In rural areas, small autonomous water supply distribution systems are managed by water user associations; and standposts supplied by ONEP are managed by private individuals (*gardien/gérant*).
- *Self-provision (38 percent).* Households, businesses, and villages securing their own water supply from surface or ground water sources. Self-provision is prevalent in many rural areas, and also occurs in peri-urban neighborhoods and at industrial facilities.
- *Alternative or informal provision (5 percent).* Independent, intermediate providers delivering water to households and communities. This informal sector service is poorly documented, but appears to be concentrated in slum and peri-urban areas, where utility provision is unavailable or insufficient. It often takes the form of delivery of containers of utility-supplied water.

Table 4: Sources of water supply in Moroccan households (1998)

	Percentage of households (weighted by population)			
Water Supply	**Utility provision**		**Self-provision**	**Alternate provision**
	Individual connection	**Standpipes**		
Urban	78.4	12.5	4.5	4.6
Rural	5.3	6.6	81.9	6.3
Total	**47.1**	**10.0**	**37.6**	**5.3**

Note: As indicated in paragraph 48, the official Government access rates used to monitor PAGER are not fully consistent with these data.

Source: National Household Standard of Living Survey 1998/1999.

[18] *Source: Direction de la Statistique* (1999). National Household Standard of Living Survey 1998/1999.

60. **Survey results confirm the existence of a sizeable informal sector of independent water vendors in both urban and rural areas**. While most urban households are supplied by utilities, the largest proportion of rural households meet their needs through self-provision (Table 4). The survey also found that 5 percent of urban and 71 percent of rural households lack any form of improved sanitation (Table 5).

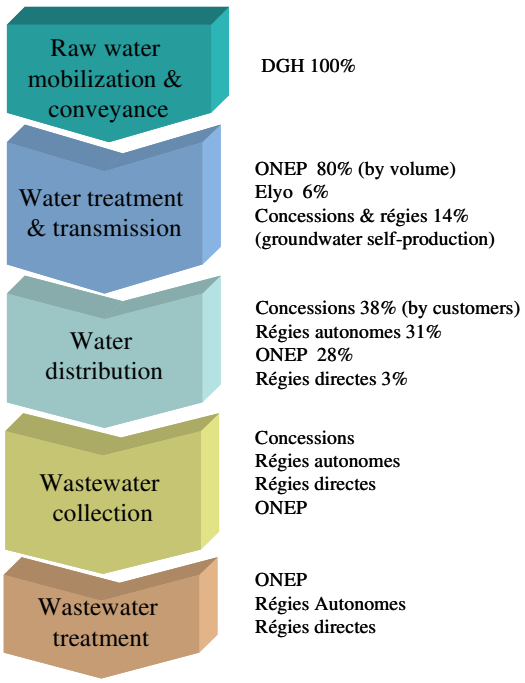
Table 5: Sources of sanitation in Moroccan households (1998)

	Percentage of households (weighted by population)		
Sanitation	**Utility provision** (sewerage connection)	**Self-provided** (latrine or septic tank)	**No improved sanitation**
Urban	80.4	14.7	4.9
Rural	0.8	28.6	70.6
Total*	**46.4**	**19.6**	**33**

Source: National Household Standard of Living Survey 1998/99.

III.1.2. Industry structure and its chain of value in the water sector

.Figure 8: Water sector service segments and main suppliers



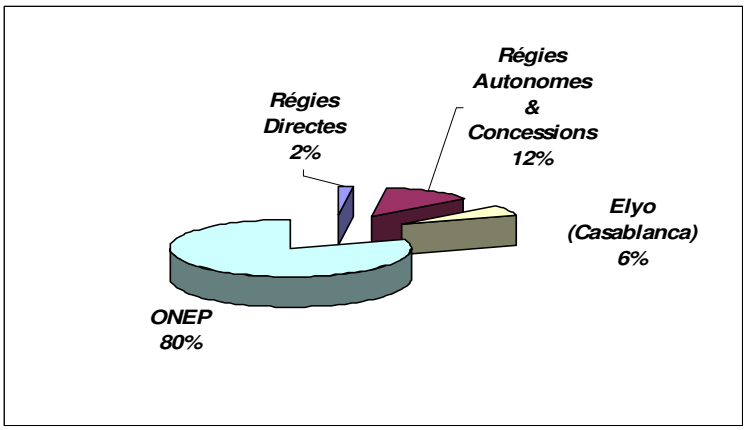
Note: Diagram does not include industrial self-provision

61. **Morocco has both vertically integrated and unbundled utilities.** ONEP, as a vertically integrated utility, provides services all along the value added chain, from water treatment and transmission to sewage collection and wastewater treatment (Figure 8). It is the only utility with an extensive presence in both urban and rural areas. All other water utilities are largely, if not entirely, dependent on ONEP, which produces about 80 percent of urban water supply (Figure 9), for the bulk of the potable water they distribute.[19] The concessions and most *Régies autonomes* also have limited self-production capacity, typically through groundwater wells, which allows them to augment their bulk water purchases. The *Régies directes* also rely heavily on ONEP for bulk supply, but can pump their own groundwater wells, which account for 2 percent of urban water production.

[19] ONEP also produces 5 percent of rural water supply. *Source:* Khalifa and Essaoubi (2002), p.125.

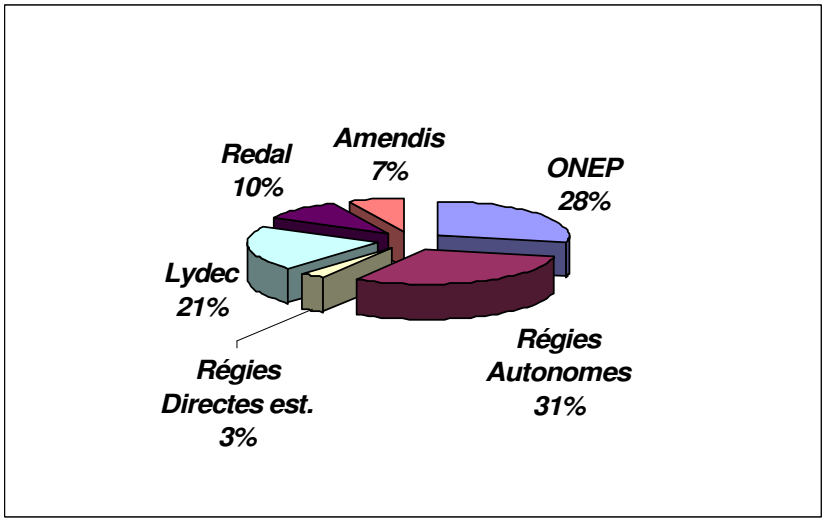
62. **Multi-service utilities for water distribution are common.** In larger urban areas, most water supply utilities also provide sanitation,[20] and distribute electricity acquired in bulk from the National Electricity Board (Office National d'Electricité – ONE),[21] as detailed in Table 6. Such horizontal multi-service utility bundling is not seen in smaller urban centers, where water is distributed by either ONEP or a local régie directe, sanitation is predominantly the prerogative of Régies directes,[22] and electricity distribution is the exclusive domain of the National Electricity Board (Office national de l'electricité, ONE.

Figure 9: Sources de production d'eau potable urbaine (par volume)



63. **In urban areas – three coexisting worlds**. The water distribution market is roughly equally split among private concessions, *Régies autonomes*, and ONEP, as summarized in Figure 10 and detailed in Table 6. Private concessions for water, sewerage and electricity service account for 38 percent of urban water customers, and are concentrated in the four largest cities – Casablanca, Rabat, Tangiers, and Tétouan. The thirteen *Régies autonomes* provide water in other large to medium-size cities, and account for 31 percent of the urban market. They also provide electricity or sewerage, or both, as detailed in Table 6.[23]

Figure 10: Urban potable water customers by provider



Source: DRSC (2003), except Régies Directes estimated. Alternative and self-provision not accounted for.

[20] With the exception of Taza and Safi, where sanitation remains the prerogative of the local governments through their *régies directes*.
[21] All four concessions, and 7 out of 13 *régies autonomes*, distribute electricity.
[22] ONEP is responsible for water distribution and sewerage in respectively ~270 and 30 small centers.
[23] In any given city, utility services not covered by the *régie autonome* are provided by ONE in the case of electricity, or by the city's *régie directe*, in the case of sanitation.

64. ONEP serves about 28 percent of the urban population. It dominates in the scattered medium and small town market, with water supply operations in about 300 towns, and sewerage service in 30 towns. The weight of *Régies directes* in water distribution is estimated at 3 percent, limited to about 40 small centers for which no customer count is available. *Régies directes* also supply more than 280 towns with sanitation. Medium-size cities such as Larache, Safi, Taza, and El Jadida still directly manage their sewers but are nevertheless expected to soon transfer sanitation to their *Régies autonomes*.

65. **Water distribution in rural areas.** Due to the rapid progress of the PAGER program, an estimated 50 percent of the rural population has access an improved water supply system.[24] Two thirds of the systems consist of improved water points, with standposts or house connections, and are managed by a water users association. The remaining third are standposts connected to ONEP regional pipelines. It is estimated that about 20 percent of these improved systems are out of service, due in part to low demand for standposts where free alternative water sources are available next to houses; and in part to lack of training or support for the water user associations. The half of the population that remains unserved gets water from traditional private or public wells, springs, rivers, irrigation canals, and water vendors.

[24] This estimate from 2003 differ from estimates by National Household Standard of Living Survey 1998/99, shown in appendix 6.

Table 6: Water supply providers by urban area

Urban Area	Operator	Other services E =electricity S =sanitation	Water Sales (Mm^3)	Number of Customers
Concessions				
Casablanca	LYDEC	E S	114.3	594,508
Rabat	REDAL	E S	58.4	269,875
Tanger	AMENDIS	E S	24.2	111,370
Tetouan	AMENDIS	E S	17.8	85,439
Total Concessions			**214.7**	**1, 061, 192**
Régies Autonomes				
Agadir	RAMSA	- S	21.4	96,768
Beni Mellal	RADEET	- S	9.0	54,930
El Jadida	RADEEJ	E S	11.5	52,703
Fes	RADEEF	E S	37.2	184,521
Kenitra	RAK	E S	16.3	60,144
Larache	RADEEL	E S	8.8	33,505
Marrakech	RADEEMA	E S	31.0	135,016
Meknès	RADEEM	E S	22.6	89,886
Nador	RADEEN	- S	3.4	18,782
Oujda	RADEEO	- S	12.1	75,637
Safi	RADEES	E -	7.6	44,509
Settat	RADEEC	- S	6.5	31,874
Taza	RADEETA	- -	4.9	21,103
Total Régies			**192.3**	**899,378**
ONEP Centers (270)	ONEP	S (30)	**138**	**797,000**
Urban Centers (~40)	*Régies Directes*	S (~280)	N/A	N/A
Total			**545**	**2,757,570**

Sources: Ministère de l'Intérieur (2002); ONEP (2002).

III.2 Demand Side

III.2.1. Connected urban demand

66. **Slower growth rate of aggregated urban demand.** The urban population has grown at an average rate of 3 percent per year over the past five years. Between 1993 and 2002, the growth of urban water demand slowed to 1.7 percent, on average, compared to 7 percent during the previous decade. This trend, combined with decreased water losses in distribution, has resulted in stagnating bulk water sales by ONEP.[25]

67. **Considerable growth of customer base.** During the same decade, the customer base grew by 7.6 percent annually, or more than 120 percent for the period. This extremely rapid growth, which affected all customer categories, can be explained by the following factors:

- Urban population growth;
- Network expansion into new service areas;
- Individual connection of customers previously served by standpipes or shared accounts.

[25] Over the last 5 years of the period (1997-2002), urban demand growth stabilized at about 2.2 percent.

68. **Unit consumption dropped**. A 7.6 percent growth in the customer base, coupled with annual demand growth of only 1.7 percent, can only be explained by a drop of unit consumption per urban account. Too many parameters have changed during the period, including service perimeters, for such a drop in unit consumption to be interpretable. In 2000, the average unit consumption of water, across all urban providers and customer categories, was an estimated 212 m^3/year/account. For residential customers only, the ratio was 156m^3/year/account,[26] which, assuming 5 persons per household, was equivalent to 8.5 liters/person/day. Average consumption, however, varied significantly by town size and operator (Table 7).

Table 7: Average residential consumptions by operator category (2000)

Operator	Average residential usage (m^3/account/year)	Observations
Concessions (4)	225	
Régies (13)	178	range: 99 in Nador, 210 in Marrakech
ONEP (270)	141	

Note: Tanger and Tétouan are included under concessions.

Source: Service Public 2000, National Study of Water and Sanitation Tariffs (2002).

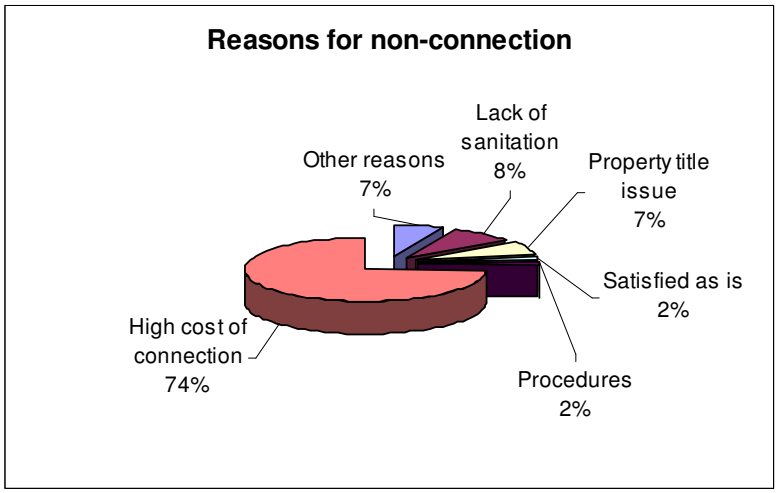
III.2.2. Unconnected urban demand

69. A survey conducted by ONEP in April 2003 in two urban areas indicates that, on average, 83 percent of households are individually connected to the water supply system. The remaining 17 percent get their water from the following sources:

- Standpipe 27.8 percent
- Collective meter 24.9 percent
- Neighbors 19.4 percent
- Private well 31 percent
- Other source 1.1 percent

[26] Service Public (2000); National Study of Water and Sanitation Tariffs (2002).

Figure 11: Reasons for non-connection to water distribution network



ONEP secondary centers survey, 2003

70. **The high cost of connection is the largest barrier to individual service connections**. The results of the ONEP survey may not be representative of the situation in larger cities, but they do illustrate the diversity of viable alternatives to an individual connection. The stated reasons for not having an individual connection, as summarized in Figure 11, help to explain the lack of access. The survey makes it clear that the high connection cost is the biggest obstacle to individual service when a distribution line is nearby. It is notable 63.4 percent of the households without an individual water connection are nevertheless connected to the sewerage network, and 58.6 percent are connected to the electricity grid.

III.2.3. Rural demand

71. **Morocco's rural water demand is characterized by strong habitat fragmentation.** The rural population has been stable since 2000 at around 12.9 million (42.5 percent of the total population), except for a slight decline in 2003. Since 1994, water service in rural areas has dramatically increased, from an estimated 14 percent access to more than 50 percent.[27] Rural water demand is highly dispersed. Settlements consist of some 39,300 localities in 32,000 *douars* (villages), administratively grouped under 1,292 rural communes. Only 56 percent of these localities are relatively dense, while 95 percent have a population of fewer than 1,000, and 45 percent have fewer than 200 inhabitants.

72. **Demand for individual private connections.** Standpipes and other shared communal water delivery facilities are not sufficient to satisfy rural demand, and surveys show stronger demand and willingness to pay for individual, private yard connections (Table 8). In fact, rural dwellers will often continue to use traditional sources such as wells and streams, which often takes less than 15 minutes, rather than walking, waiting, and paying for potable water service at a standpipe situated further away. Per capita standpipe consumption is, on average, 8 liters/person/day in rural areas, at a price of about MAD 8.4/m^3 – more expensive than in urban areas.[28] The mismatch between the mode of supply and expressed demand is all the more worrying because

[27] However, 20 percent of the connections may be either out of order or not used due to low demand.
[28] ONEP (2003c), *Standpost Operating Indicators in Rural Areas, Fiscal Year 2002* (*Indicateurs d'exploitation des bornes fontaines en milieu rural, exercice 2002).*

the average capital cost per person of communal water supply systems implemented under PAGER is MAD 1,000 (US$940) per person served.

Table 8: Rural Water Demand

Water supply type	Average consumption (1996) l/day/unit	Average annual increase
Individual connection	45	1.1
Standpipe	24	2.0
Well or borehole	15	0
Livestock	20	0.75

Source: Khalifa and Essaoubi (2002), p. 225

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III.3 Willingness and ability to pay

73. **Spending levels are, on average, well below WHO's guidelines of not more than 3.5 percent of total household income for water supply, and 1.5 percent for sanitation.** Limited data is available to assess the willingness and capacity to pay for improved water and sanitation service in both urban and rural areas; and the public utilities do not routinely carry out willingness-to-pay surveys. Data from the National Household Living Standards Survey 1998/99 assessed total expenditures for water supply at MAD 184.8/person/year in urban areas and 147.4 MAD/person/year in rural areas, or 1.8 and 2.9 percent of average total per capita expenditure (Table 9). Demand elasticity was estimated, from a similar survey conducted in 1990, at -0.92 in urban areas and -0.09 in rural areas. The latter figure suggests that rural water supply was so scarce at the time the survey was taken that consumption covered strictly incompressible needs.

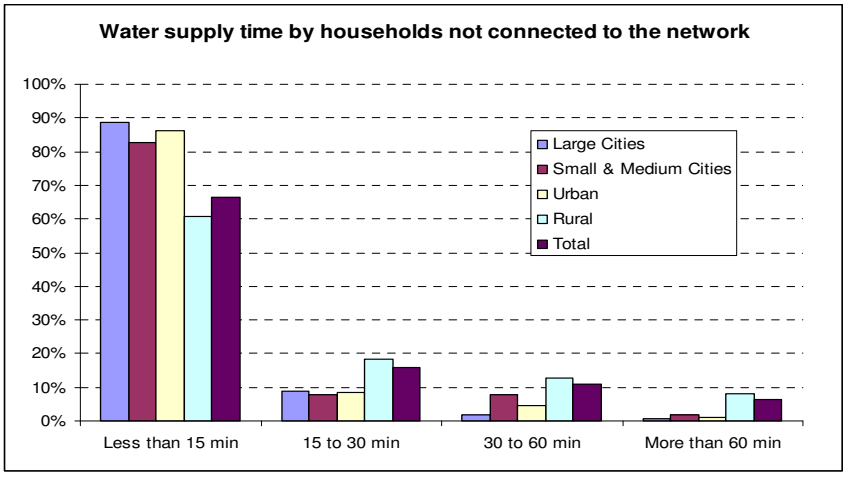
74. More recent measurements for the National Sewerage Master Plan, and by consultants Service Public 2000, suggest that as of 2002, water supply represented 1 to 1.4 percent of total individual spending in households with their own connections (average expense of MAD 66 to 98/person/year). Concurrently, it is believed that some households may support significantly higher water budgets. In particular, unconnected households that rely on informal alternate providers to deliver water in tankers and containers pay more for their water. While typically in the range of MAD 30-40/m^3, water deliveries can reach MAD 80/m^3, which, assuming a usage of 20m^3/day, would add up to MAD 550/person/year.

Table 9: Annual per capita water supply expenses, per expenditure category (MAD/person)

Annual water expenses, and percentage of total expenditures by area		Class of Annual Per Capita Expenditure					
		C 1 less than 3,404 MAD	**C 2** 3,404 to 4,912 MAD	**C 3** 4,912 to 6,805 MAD	**C 4** 6,805 to 10,329 MAD	**C5** 10,329 MAD and over	**Average**
Urban	Annual water expense	70.7	121.0	132.6	163.1	269.1	184.8
	% total expenditures	*2.0*	*2.2*	*1.7*	*1.5*	*1.2*	*1.8*
Rural	Annual water expense	68.8	186.7	136	169.5	201	147.4
	% total expenditures	*3.3*	*5.9*	*3.2*	*2.9*	*2.0*	*2.9*
Total	Annual water expense	69.9	135.3	133.2	163.9	265.9	179.4
	% total expenditures	*2.7%*	*3.3%*	*2.3%*	*2.0%*	*1.5%*	*2.3%*

Source: National Household Standard of Living Survey, 1998/99, and World Bank

Figure 12: Water supply time for unconnected households



Source: National Household Standard of Living Survey, 1998/99.

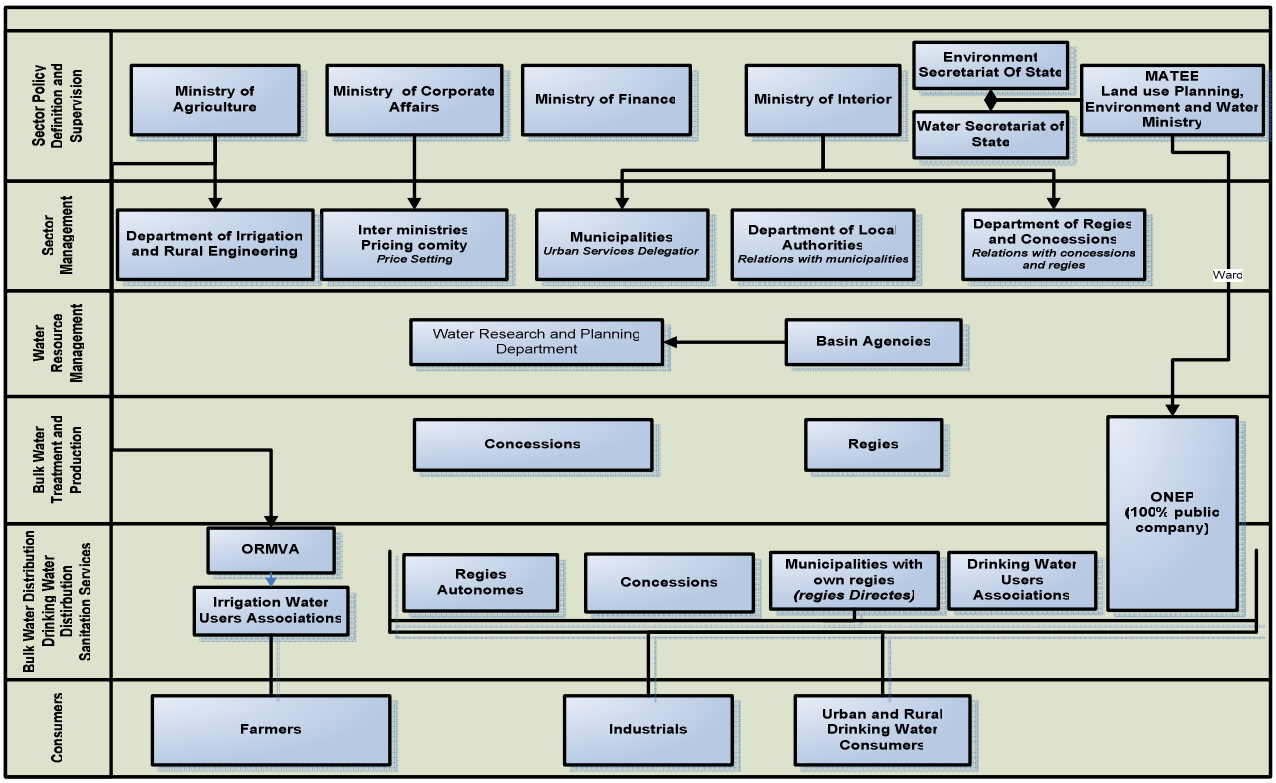
IV WATER SECTOR ORGANIZATION AND INSTITUTIONS

75. Morocco's water sector is characterized by a complex and fragmented institutional framework, which has hindered the formulation of a comprehensive sector-wide vision and the establishment of coherent policy objectives. This has led to inefficiencies in the allocation of funding for capital investments, and misalignment between new sector priorities and infrastructure investment.

IV.1 Major Sector Players

76. Multiple players are involved at both the central level (ministries, secretariats, ONEP); and the local level (*Régies,* private concessionaires, irrigation operators, river basin agencies, municipalities). Sector institutions perform one or more of four key functions: (a) policy formulation and supervision; (b) water resources management; (c) service provision; and (d) regulation. A simplified map of the sector organization is provided in Figure 13. The main sector organizations and their functions are described below.

Figure 13: Functional organization of Morocco's water sector institutions



IV.1.1. MATEE

77. The overarching institution in the sector is the Ministry of Land Planning, Water and Environment (*Ministère de l'aménagement du territoire, de l'eau et de l'environnemen,* MATEE), which has a vertical presence in the sector, with responsibility for water policy setting, and a supervisory role in resource management, as well as in bulk and retail water supply and sanitation. MATEE oversees the work of all major sector institutions except for the autonomous river basin agencies (see below).

78. In its supervisory role, MATEE oversees the Directorate of Water Resources (*Direction générale de l'hydraulique,* DGH),[29] the lead agency for water resources planning and management, and for rural water (see below). MATEE also oversees the Water Secretariat (*Secrétariat d'etat chargé de l'eau),* which manages meteorological information and conducts water resources development studies; and ONEP, which provides 80 percent of the bulk water supply in the country, and plays a central role in provision, water production, distribution, and sanitation (see below).

79. MATEE's reach into dam construction through DGH, and into service provision through ONEP (see below), carries potential conflicts of interest with its policy setting and resource management roles.

IV.1.2. DGH

80. As the lead agency for water resources planning and management, DGH is responsible for developing water resources for all uses, including major dam construction and operation. It also was one of the implementing agencies for the rural water program, PAGER. DGH comprises: (a) the Directorate of Water Research and Planning *(Direction de la recherche et planification de l'eau,* DRPE*),* responsible for the study, planning, and monitoring of surface water and groundwater resources; and (b) the Directorate of Hydraulic Works (*Direction des aménagements hydrauliques*), traditionally in charge of the planning, construction, and operation of dams and reservoirs. The role of DGH is being redefined with the transfer of some of its responsibilities to the river basin agencies and ONEP.

IV.1.3. ONEP

81. The National Potable Water Board *(Office national de l'eau potable)* is a financially autonomous public water and sewerage enterprise that plays an important role in planning and executing the Government's strategic water sector goal. ONEP produces 80 percent of the bulk water supply in the country, provides retail water supply and sanitation services in medium and small towns, and is now solely responsible for developping rural water supply. (See the detailed discussion of ONEP in the section service providers, below).

[29] DGH was formerly under the Ministry of Public Works *(Ministère de l'equipement).*

IV.1.4. River Basin Agencies

82. Morocco's seven river basin agencies are semi-autonomous, financially independent public entities with responsibility for river catchments. They are administered by a Board of Directors chaired by MATEE and comprising local governments, water user associations, and other stakeholders (academics, chambers of commerce). River basin agencies have seven principal responsibilities: (a) develop and implement an integrated master plan for river catchment areas; (b) authorize water abstractions and discharges, and maintain a public register; (c) collect charges for abstraction and effluent discharges; (d) provide financial help and technical assistance to public organizations, communities, and the private sector for the prevention of water pollution and the efficient use of water resources; (e) monitor the quality and quantity of both surface and groundwater; (f) develop an adequate emergency response system; and (g) develop appropriate measures to increase public awareness about water resource management.

83. Field implementation of these principles and reforms is incomplete, and much remains to be done, including: (a) issuing decrees with regard to discharge fees to be collected by river basin agencies; (b) reallocating resources and responsibilities among key sector players; and (c) better integrating the fragmented policies of sector players.

84. The river basin agencies are also responsible for monitoring compliance and enforcing water quality and pollution prevention rules. While they have broad authority to enter into contractual arrangements with all types of bodies, agencies, and institutions in fulfillment of their mandate, they lack the resources to fulfill this essential compliance role.

IV.1.5. Local Governments

85. Local governments own the water supply and sewerage assets and are responsible for supplying water and sanitation in their communities. They have the option to either provide these services directly (*Régies directe*); establish an autonomous, often multi-service, public utility (*régie autonome*); or delegate the service to ONEP or a private operator. (These entities are described in detail in the section on providers.) All large cities and many urban centers delegated the provision of water supply to specialized operators decades ago, and this urban market segment is now fairly evenly distributed among private concessionaires (38 percent), ONEP (28 percent), and *Régies* 31 percent). Sewerage services and rural water supply remained part of core municipal functions until the mid-1980s and mid-1990s, respectively, but are now being gradually delegated to specialized operators.

IV.1.6. Other Ministries

86. The Ministry of Interior (*Ministère de l'interieur*), through its Water and Sanitation Directorate (*Direction de l'eau et de l'assainissement,* DEA),[30] assists local governments with water and sanitation issues, and plays an active role in planning, implementing, and supporting the operations of basic water and sewerage infrastructure.

[30] Within the Ministry, the Water and Sanitation Directorate is under General Directorate of Local Governments (*Direction générale des collectivités locales*).

87. The Ministry of Interior also acts as de facto regulator of the sector, through its Directorate of Public Utilities and Concessions *(Direction des Régies et services concédés),* which has representatives on the boards of each *régie autonome,* and on the permanent monitoring committees *(comitiés de suivi permanent)* for each concession. Through these venues, the Interior Ministry has a direct say in the management and performance of *Régies*, and provides technical advice on concession contract administration issues, including performance, investment programs, and tariff adjustments.

88. The Ministry of Finance *(Ministère des finances*) is responsible for financial oversight of all formal water sector operators, including government operators, through its General Accounting Office *(Court des competes),* and its Directorate of Public Corporations and Privatization *(Direction des establishments publics et de la privatization,* DEPP). The Finance Ministry also regulates the contracting aspects of privatization and concession schemes for state-owned infrastructure.

89. The Ministry of General and Economic Affairs (*Ministère des affaires generals et èconomiques*) leads the Inter-ministerial Pricing Committee (*Comité interministériel des prix),*and advises the Prime Minister on water and sewerage tariff adjustments.

90. The Ministry of Public Health (*Ministère de la santé publique,* MSP) is the main water quality regulator in the sector, responsible for setting and enforcing public health drinking water standards. However, the monitoring of drinking water quality at the production and distribution stages relies heavily on operator self-monitoring and reporting (e.g., through ONEP's laboratory network).

91. The Ministry of Agriculture and Rural Development (*Ministère de l'agriculture et du développement rural)* oversees the agriculture sector, the largest single consumer of water, and has a decisive role in water resources mobilization, resource allocation, efficiency, and conservation. It operates through the *Administration du génie rural* (AGR) at the central level, and through *Offices régionaux de mise en valeur agricole* (ORMVA), financially autonomous public enterprises, at the local level. The Ministry oversees three irrigation management models: nine ORMVAs manage large, modern irrigation schemes, which account for about 50 percent (700,000 ha) of Morocco's irrigated land. Water users associations manage medium to small-size irrigation perimeters, covering an estimated 35.7 percent of available irrigated surfaces (500,000 ha). Private systems, built and managed by their owners, account for up to 14.3 percent of irrigated areas (200,000 ha).

IV.1.7. Inter-Ministerial Coordinating Bodies

92. The High Council for Water and Climate *(Conseil supérieur de l'eau et du climat,* CSEC), created in 1995 and strengthened by the 1995 Water Law, is the highest advisory body and forum on national water policies and programs. Chaired by the Prime Minister, it is mandated to coordinate water resource policy development, the National Water Strategy, and the National Water Plan, including River Basin Master Plans. CSEC comprises major public and private sector stakeholders involved in water resources management, including water users associations. A standing committee headed by MATEE serves as secretariat. The Council has not historically complied with the obligation to meet at least once a year, and is not considered a sufficiently effective tool for Morocco's water sector.

93. The Interdepartmental Water Commission (*Commission interministérielle de l'eau)*, also chaired by the Prime Minister, was created in 2001 to negotiate a water sector structural adjustment facility with the European Union.

IV.2 Major Water and Sewerage Service Providers

IV.2.1. ONEP

94. ONEP is a financially autonomous, state-owned water and sewerage enterprise (although a priori control by an *agent comptable,* appointed by Ministry of Finance, still somewhat limits ONEP's autonomy). Established in 1972, its quasi-monopoly status is more historical than legal in nature, as no serious restrictions impede market entries.[31] ONEP took over responsibility for bulk water production from the former *Régie des exploitations Industrielles* (REI) in an effort to consolidate managerial, technical, and financial resources in a national agency for water production. ONEP is managed in accordance with commercial principles under the supervision of MATEE (before 2002, under the Ministry of Public Works). Its activities are governed by a Framework Agreement with the Governement *(Contrat programme),* updated annually, that sets the goals, means, and priorities of ONEP's interventions. A 20-member board, headed by the Prime Minister and comprising representatives of Government ministries and agencies and ONEP customers, supervise its activities. A technical committee composed of four Board members follows up on Board decisions. Government control covers major decisions such as investments, operating budgets, borrowing, tariff levels, code of employment, and major procurement. ONEP's General Director is appointed by the King and is responsible for day-to-day operations. .

95. In 2002, ONEP's revenues from water sales and services amounted to MAD 1.56 billion (US$166 million). ONEP receives its raw water from reservoirs and primary canals operated by DGH. Its extensive infrastructure of water treatment plants and transmission pipelines, some of which are interconnected, then allows reliable delivery of potable water at the entry point of urban distribution systems. Since its inception, ONEP was also entrusted by the Government with the management *(gérance)* of water supply systems in 61 secondary towns. ONEP has expanded its territory by substituting for *Régies directes* (see below) in the operation, maintenance, and management of water supply systems, and now operates in some 270 small and medium-sized towns. In the past, some ONEP centers developed to such an extent as to justify the creation of a new *régie autonome*, while some others have been incorporated into existing *Régies*. This process is likely to continue, albeit to a limited extent. Such delegated activity takes place in an unclear contractual framework, under which ONEP derives no profits and assumes no responsibility for operating losses and liabilities. Such arrangements are not far from the pass-through management contract model. Importantly, ONEP also controls the distribution of national solidarity surcharges (intra-sector transfers),[32] devised to subsidize such loss-making operations. Finally, ONEP's mission to bring potable water to Moroccans has in recent years been expanded to encompass rural areas, and this represents a substantial and transforming challenge for the institution.

[31] Historically, before the independence proclamation of 1956, urban water production and distribution were ensured through concessions. Between 1961 and 1971, as concessions reached their terms or were nationalized, their infrastructure was selectively assigned to either ONEP or to local *régie*s. In keeping with the need to empower a central agency to fulfil the policy priority of rapidly expanding water resources and supply, ONEP was made increasingly more powerful.

[32] Surcharges are paid by customers of *régies autonomes* and concessions.

96. ONEP's mandate was amended in 2000 to include sewerage services in centers willing to replace service provided by *Régies directes*. ONEP is thus taking responsibility for sewerage in urban centers where it already provides water. At the end of 2003, ONEP was responsible for sewerage services in some 30 urban centers. Current expansion plans include taking on sewerage responsibility in 80 additional priority areas.

IV.2.2. Régies Directes

97. *Régies directes* are municipal departments of local governments in small cities and towns that directly provide water and sewerage services, using municipal crews, as part of a range of other basic local services, such as drainage and solid waste management. Because of their limited financial and human resources, and total lack of autonomy from local government, *Régies directes* are typically among the least performing and responsive actors in Morocco's water sector. In carrying out such responsibilities, local governments can call upon the expertise of the specialized Directorate of Water and Sanitation (DEA) of the Ministry of Interior. Yet recognizing their limitations, the Government of Morocco has been promoting the transfer of their responsibilities to specialized operators, such as ONEP or, where available, a local *régie autonome* (see below).

98. The vast majority of small centers have handed over responsibility for water service to ONEP through a management contract, and only some 40 small centers now maintain a *régie directe* for water. However, about 280 towns are still directly operating their sewerage systems, including medium-size towns such as Larache, El Jadida, Safi, and Taza. These four towns are expected to transfer sanitation to their local water and electricity *Régies autonomes* in 2004. With ONEP's new mandate to develop sanitation across Morocco, the remaining sewerage *Régies directes* are bound to be gradually transferred to ONEP over the next few years.

IV.2.3. Régies Autonomes

99. *Régies autonomes* have the status of autonomous municipal utilities, and are managed in accordance with commercial principles under the supervision of the Ministry of Interior and the Ministry of Finance. The regulations governing their management and operation for water supply, sanitation, and electricity are set out in Decree No. 2-64-394 of 1964. The first ten *Régies autonomes* were created during the nationalization decade (1961-1971), and benefited from the transfer of trained technical staff from the former REI and from the Moroccan Distribution Society *(Societé marocaine de distribution)*, a private Moroccan subsidiary of *Lyonnaise des Eaux.* For historical reasons such *Régies* retained responsibility for electricity distribution, and represent an exception to ONE's monopoly rule. The more recently created *Régies* do not provide electricity service.

100. The *Régies* are under the administrative tutelage of the Ministry of Interior, through its Directorate of Public Utilities and Concessions. Since January 13, 1993, this Directorate has had the role of a posteriori control (inspection) of the *regies*. Their financial supervision is the responsibility of the Ministry of Finance's Directorate of Public Corporations and Privatization. A board of 10 members supervises their operations. The provincial Governor or the Region's Wali is the Chairman of the board, which typically includes representatives of the Ministry of Interior and Ministry of Finance, and six elected members from the local municipal council. (Specific organizational structures and roles vary with the size and sectoral responsibilities of the *régie). Régie* directors are appointed by the Prime Minister and are responsible for day-to-day operations.

101. The combined revenues of *Régies autonomes* amounted to MAD 3.1 billion (US$330 million) in 2002 (before participations and refundable works), of which MAD 1 billion (US$110 million) came from water services. The *Régies* distribute water to about 900,000 customers (approximately 31 percent of Morocco's urban customers), and provide sanitation and electricity services to 626,000 and 615,000 customers, respectively. While *Régies autonomes* are focused on providing service to large cities and their peri-urban neighborhoods, their operations can encompass semi-rural and rural territories, as well as secondary centers within a given province. The *Régie autonome de distribution d'Oujda* (RADEEO) reportedly serves population clusters as far as 100km from Oujdah. No subsidies apply to such scattered operations.

IV.2.4. Private Concessionaires

102. All private concessions encompass water, sanitation and electricity service. In April 1997, a 30-year concession for the distribution of water, sewerage and electricity service was announced between the municipalities of Casablanca and Mohammedia and LYDEC, an international consortium controlled by the Suez group. This negotiated contract symbolized the Government's determination to bring private sector practices and financing into Morocco's water sector. The Casablanca/Mohammedia concession was followed in 1999 by a negotiated concession for the Rabat/Salé conurbation, and by competitively bid concessions in Tangiers and Tetouan in 2002.

103. The ownership of the major concessionaires is described below.

- LYDEC, the concessionaire for Greater Casablanca since October 1997, is a Franco-Spanish consortium of Suez-Lyonnaise des Eaux (59 percent), Electricité de France (18 percent), Endesa (18 percent), and Agbar (5 percent).

- REDAL, the concessionaire for Greater Rabat since January 1999, was originally a Spanish-Portuguese consortium of controversial performance. Since October 2002, REDAL has been a wholly-owned subsidiary of French group Veolia Environnement.

- AMENDIS, the concessionaire for Tangiers and Tetouan since January 2002, is the first consortium to involve Moroccan private parties. Its ownership includes Veolia Environnement of France (51 percent), Hydro-Québec of Canada (18 percent), and the Moroccan companies ONA (16 percent) and SOMED (15 percent). By contract, Moroccan ownership cannot drop below 31 percent.

104. The combined revenue of concessionaires in 2002 exceeded MAD 6.5 billion ((US$691 million), of which MAD 1.5 billion (US$160 million) came from water distribution activities, not including participations and reimbursable works. The four concessions provide water to more than 1.1 million customers (about 39 percent of Morocco's urban market), and electricity to 1.2 million customers. All concession contracts include infrastructure investment obligations, with a particular emphasis on sanitation works. Table 10 shows the comparative scope of the respective contracts in their initial years.

Table 10: Comparative scope of Morocco's concession contracts

	Concessions			
	Casablanca	Rabat	Tangiers	Tetouan
Year of award	1997	1999	2002	2002
Mode of award	Negotiated	Negotiated	Bid	Bid
Duration	30 years	30 years	25 years	25 years
Revenues (MAD/yr)	4 bn	1.7 bn	0.8 bn	0.4 bn
Clients	561,000	248,000	120,000	79,000
Employees	3,585	2,018	840	1,440
Water sales (Mm3)	118	63	25	19
Non-revenue water	30%	21%	33%	42%
Investment commitment (MAD)				
• Water	5 bn	3.7 bn	0.8 bn	1.0 bn
• Sanitation	16 bn	5.6 bn	1.8 bn	1.5 bn
• Electricity	9 bn	4.4 bn	1.1 bn	1.4 bn
• Total	30 bn	13.7 bn	3.7 bn	3.9 bn

105. All aspects of the concessions are regulated by contract (see section on the regulatory environment), including service and performance obligations, investment obligations, tariff adjustments, reporting, dispute resolution, and termination. Concessionaires are accountable to a Delegating Authority, comprising representatives of local governments served, and supported in technical matters by the Directorate of Public Utilities and Concessions (DRSC). Day-to-day contract administration is the responsibility of a technical Permanent Monitoring Committee (*Comité permanent de suivi),* which until now has had limited resources. It is generally accepted among Morocco water sector experts and policymakers that the concessions as a whole are performing satisfactorily under the "regulation by contract" approach, although they are falling short of their reporting obligations. Consumers report being satisfied with improved services.

IV.2.5. Informal urban suppliers

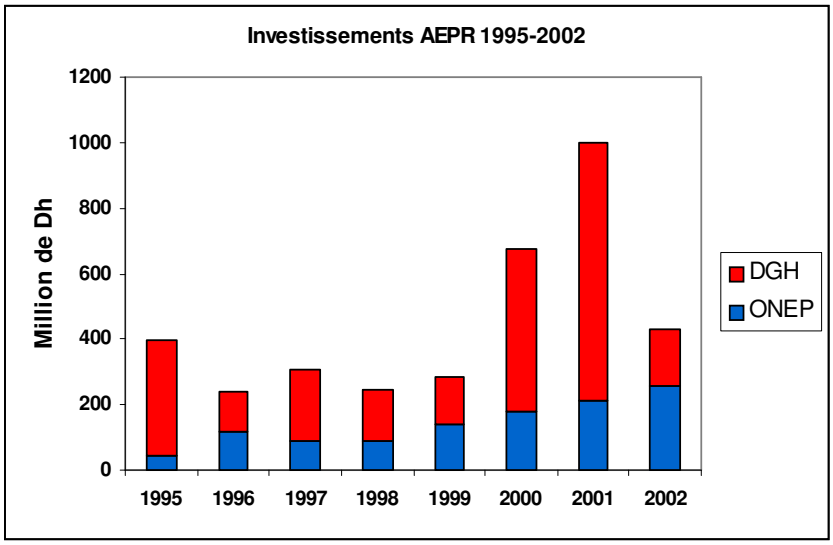
106. **Up to 5 percent of Moroccans depend on alternative, informal providers for their drinking water supply**. Surveys presented in appendix 6 indicate that alternative provision is about 4 percent in urban areas and 6 percent in rural areas. Alternative provision essentially takes the form of water vendors delivering water in tankers and containers in areas not served or insufficiently served by formal utilities. In urban areas, it is confined to precarious settlements, such as slums and peri-urban neighborhoods. Water vending is also common in older popular neighborhoods (medinas, casbahs) with degraded infrastructure and crowded, unsanitary conditions. Such neighborhoods consist predominantly of recent migrants from rural areas. In rural areas, water vendors operate mainly in times of drought.

107. Limited quantitative information suggests informal water vendors sell water at up to 10 times its distribution price, and that some spontaneous pricing and territorial regulation is at play among various vendors.

IV.2.6. Rural water supply providers

108. Since January 2004, ONEP has been solely responsible for achieving the Government's rural water supply objectives, i.e., to provide potable water access to 92 percent of rural populations by 2007, through implementation of PAGER program. Between 1995 and 2003, this responsibility was shared with DGH, and Figure 14 shows how, from an investment point of view, DGH once led ONEP in PAGER program implementation. During that time, rural populations access to potable water increased from 14 to 50 percent.[33]

Figure 14: Rural Water Supply Investment 1995-2002



109. DGH's approach consisted of equipping villages and hamlets with stand-alone, typically groundwater sources, such as wells, boreholes, or spring catchments; then entrusting their management and maintenance to a local water users association, which was responsible for collecting service fees from users. By contrast, and until January 2004, ONEP's approach was to supply villages located within a reasonable distance of its existing potable water transmission lines, and install extended service lines to feed tanks and standpipes. ONEP's preferred management model has been to designate a private individual (*gardien gérant*) to oversee operations and routine maintenance on the system, with his remuneration coming from the collection of user fees. ONEP is also seeking to encourage local private entrepreneurs, water users associations, and eventually rural local governments to take on more extended O&M responsibilities for rural water supply systems.

[33] Such access rate assumes that all constructed new facilities are in fact still operable and being used, which is not the case.

V SECTOR RESTRUCTURING AND COMPETITION

110. **International experience has shown that the quasi-monopoly integration of operating responsibilities across vast territories involves long-term risks of reduced responsiveness, efficiency, transparency, and accountability of service. Nevertheless,** ONEP remains a quasi-monopoly in the water production and transmission segment, including in secondary towns. Adding to its quasi-monopoly in water production, and coupled with the capture of water distribution surcharge subsidies to secondary centers, ONEP is set to gain similar dominance in sanitation,[34] by gradually taking over sewerage service from the 280 municipalities that still provide such service, and by controlling a possible sanitation surcharge for infrastructure funding. ONEP has also become the exclusive agent in rural water supply, and controls PAGER surcharges. The extraordinary process of ONEP's vertical and horizontal integration illustrates the level of trust this operator has gained over the years with the Government and various donors. While such integration may be justified for fast-track systematic implementation of large infrastructure programs, it may need to be reassessed for the subsequent long-term O&M phase.

111. Despite ONEP's dominance, the sector has seen some significant changes. In particular, the management of dams and primary transmission channels for raw water mobilization, which had been the domain of DGH, is now to be shared with or transferred to the river basin agencies. Also, the urban distribution segment is now occupied by two foreign private groups (Suez and Veolia), and by 13 municipally owned *Régies*. The current reach and weight of various providers in the chain of urban water supply and sanitation services is summarized in appendix 1.

112.It is likely that the Government's interest in potentially consolidating urban and rural distribution service providers into a few new regional operators is aimed at identifying better-performing and more sustainable entities for future operations and asset management.

[34] The wastewater treatment segment is still negligible, with only 15 out of 54 sewerage plans in operation. However, ONEP is planning 79 wastewater treatment plants as part its "80 priority centers sanitation program, which itself is part of the new pollution control infrastructure planned by ONEP and the concessions.

Table 11: Summary of water sector restructuring trends.

Deregulation	None
Horizontal restructuring	ONEP is by design a horizontally integrated national operator. Some more horizontal restructuring is at play: • ONEP's role and territory have expanded with recent exclusive sanitation and rural water supply mandates. GOM promotes absorption of *Régies directes* by ONEP. • GOM is considering options for consolidation of current urban & rural service providers into a few new regional operators, with unbundling of electricity.
Vertical restructuring	Consolidation is promoted at the expense of *Régies directes*: • ONEP is to expand in sanitation in small towns. • All *Régies autonomes* are required to include sanitation
Management privatization	Not a preferred approach: Few cases of contract operations, e.g., El Hoceima's Waste Water Treatment Plant.
Investment privatization	Extensive concessions in place, with investment obligations: • Casablanca, Rabat, Elyo (negotiated) • Tanger, Tetouan (bid) • Marrakesh or Fes next?
Privatization auctions	No privatization of assets.
Protection of entry through exclusivity	No significant legal obstacles to production or retail market entry. ONEP's de facto monopoly is not protected by law.

113. **Opportunities for competition.** Competition in Morocco's water sector remains weak. The introduction of private sector participation in distribution concessions is expected to improve the quality of service and efficiency of operations, while providing infrastructure financing (see section on financing and taxation). However, no mechanism is in place to promote competition among distributors, or to measure their relative competitiveness. Furthermore, the substantial water production segment, dominated by ONEP, is not affected by competition or privatization pressures, even though, as noted above (in the section on service providers), there are no serious restrictions to market entry. Since ONEP is under no obligation to satisfy all bulk water demands, or must any *régie* guarantee ONEP any minimum purchase volume, it is surprising that ONEP has made no contracts with other distributors of bulk potable water.[35]

114. **Limits to competition.** The arrival of private operators under long-term concessions has reinforced "competition by comparison" between private and public operators. By representing a viable service provision alternative for larger cities, private operators also expand the options of local governments currently tied to provision by *Régies autonomes*. Competition may remain limited, however, until decentralization makes elected local governments fully accountable to their constituencies for water supply and sanitation, among other services. On the other hand, until local private alternatives emerge, competition is unlikely in the fragmented small town market, which is hardly viable for current large private operators, and thus captive to ONEP.

[35] An exception is the convention between ONEP and RADEEO, which guarantees minimum take-or-pay demands, and allows ONEP to invest in significant water supply infrastructure.

115. **Unbundling distribution of different sectors or not?** Unbundling of services from utilities such as *Régies autonomes* and concessions responsible for water, sewerage and electricity has not until now appeared justified. Operators rely on electricity revenues for internal cross-subsidy of water and sanitation costs, and claim significant customer service synergies among the three activities. Loss of electricity revenues and cross-subsidy flexibility may, in fact, reduce the attractiveness of concessions for the private sector. Furthermore, unbundling of electricity amounts to transferring such service to ONE's distribution monopoly – not a simple proposition for a mayor seeking better service for his constituents. Nevertheless, an ongoing Government study of options for sector reorganization[36] does assess possible regionalization scenarios for water and sewerage services, including some with unbundling of electricity distribution. The objective of such restructuring would be to consolidate urban and rural services into critical-size regional water and sewerage utilities, with bulk water provision remaining the exclusive responsibility of ONEP.

116. **Promoting competition.** In the context of promoting competition, it is important that concession contracts be enforced and administered towards maximizing the delivery of cost-efficient service. Similarly, the regulatory framework could be strengthened to ensure open and transparent competition in future private sector participation tendering. Finally, the central administration could empower large and medium-size local governments with the expertise and resources needed to assess the feasibility of their private sector participation options, and to initiate and conduct a tendering process.

[36] McKinsey (2003).

VI THE REGULATORY ENVIRONMENT

VI.1 Legal Framework

117. **The regulatory framework for the water sector is based on a set of disparate laws, some of which are obsolete.**[37] Regulation is incomplete and lacks precision on important aspects, such as tariffs and rules for contracting a water or sanitation system operator.

118. The regulatory framework is structured around five main laws:

- Law No. 78-00, the Communal Chart;
- Law No. 10-95, the Water Law;
- Law No. 69-00 on Financial Oversight by the State;
- Law No. 06-99 on Competition and Price Freedom; and
- Law No. 39-89, amended by Law No. 34-98, authorizing the transfer of public enterprises to the private sector.

119. **The Communal Chart rules the organization and operation of local governments, and spells out their responsibilities for potable water supply, sanitation. and wastewater treatment.** Law No. 78-00, the Communal Chart, was promulgated in 2002 to replace the Chart of 1976. Local governments can choose to deliver services through a *Régie directe,* or delegate this responsibility to a *Régie autonome*, a concession, or any other form of management contract. Delegation to a specialized operator such as ONEP or to a private contractor is subject to the approval of the Ministry of Interior, which oversees local governments.

120. **The Water Law is the main legislative text ruling the water sector.** It was promulgated in 1995 to replace numerous laws and regulations, some enacted as early as 1914. The Water Law defines water resources as public property and specifies the conditions for granting permits for their exploitation. It mandates that when water is used for irrigation, both customary water rights (recognized if registered before July 2000) and authorized permits are linked to the irrigated land and cannot be traded separately. The Law also provides for: (a) water quality protection, by defining environmental mandates and enforcing sanctions and penalties; (b) a comprehensive framework for integrated water resource management, including a National Water Plan and river basin plans; (c) cost recovery through charges for water abstractions; and (e) a water pollution surcharge based on the principle of "polluter pays"; (f) the enforcement of abstraction permits, effluent discharge permits and flood control measures; and (g) penalties for violations of the Law. Finally, the Water Law clarifies the mandates, functions, and responsibilities of the river basin agencies and other institutions in water resources management.

121. **The Competition and Price Freedom Law states that water and sewerage tariff changes are subject to controls until mid-2006.** This Law aims at controlling anti-competitive practices and establishing price-setting mechanisms for a range of goods, products, and services distributed under monopolistic or quasi-monopolistic conditions. It is possible that after 2006, the Government may relinquish ultimate control over water pricing, and, for example, allow the boards of local *Régies* to plan and implement their own tariff adjustments. However, the provisions of Law 06-99 do not apply to services delivered by private sector concessions, who adjust their tariffs in accordance with their concession contract. Accordingly, tariff regulation *is*

[37] The earliest reference dates back to the dahir of July 1, 1914, later expanded in 1919 and 1925.

not homogeneous across the sector, and in fact is significantly more constraining and uncertain for public utilities than for private providers. (See section on tariffs and taxation, below).

122. **Other relevant laws.** While the Law on Financial Oversight by the State clearly has the negative effect of hindering the financial management autonomy of the *Régies*, its efficiency in regulating capital and operational expenditures in concessions also remains to be demonstrated. Finally, Law 39-89, as amended by Law 34-98, on the transfer of public sector enterprises to the private sector, does not offer specifics as to how local governments may structure any service delegation, including private sector participation, for water or sewerage service. The need exists in fact for a text that would rule the contracting of any form of local or municipal services, including water supply and sanitation, but also electricity distribution, solid water management, public transportation, etc.

123. **As a whole, the regulatory framework for water and sanitation services will need to include more complete and coherent provisions** if Morocco wants to fully implement the Water Law and achieve its sector development goals of: (a) rational water resource management; (b) generalized access to services; (c) preservation of the quality of water resources; and (d) the financial sustainability of water service providers.

VI.2 Regulatory Practices

124. **Heterogeneous regulatory coverage.** The three main categories of operators (ONEP, *Régies*, and private concessionaires) are subject to a radically different set of rules and regulatory control conditions. Four agencies contribute to economic regulation of the sector, but none fulfills a comprehensive regulatory role:

- The Ministry of the Interior, through its Directorate of Public Utilities and Concessions, supervises all aspects of *Régies autonomes* operations, and provides technical leadership to the Monitoring Committees that supervise and administer concession contracts;
- The Ministry of Finance, through its Directorate of Public Corporations and Privatization *(Direction des etablissements publics et des privatizations),* is involved in auditing the *Régies*, and in the contracting and auditing of concessions;
- The Interdepartmental Commission on Prices decides on tariff increases requested by ONEP and the *Régies*, and approves contractual increases for concessions;
- Finally, river basin agencies are expected to grow into important regulatory agents for the better management and restoration of ambient water resources.

125. With the exception of the river basin agencies, which have financial autonomy, none of these regulatory entities is autonomous, let alone independent. The entities are not required to be transparent and accountability to the public, and no formal mechanisms exist for stakeholder consultation and participation.

VI.2.1. Regulatory regime for public operators

126. **Public operators are regulated through tariff adjustment mechanisms.** Public operators such as ONEP and the *Régies* are not strictly accountable to any client under performance-based contracts, and are essentially regulated through less than predictable tariff adjustment mechanisms, as discussed in the section on tariffs.

127. **Overregulation of some aspects of the *Régies* operation.** The *Régies* operate under the auspices of statutory documents and framework agreements with the préfecture or municipality they serve. They are accountable to a board, controlled and chaired by local governments, which tend to see the *régie* as a municipal department rather than as an autonomous enterprise. Meeting proceedings, annual programs, and annual reports are not made public. *Régies* are also under tutelage of the Directorate of Public Utilities and Concessions of the Ministry of Interior, which oversees every aspect of their operations, including procurement. As part of the Government's financial controls system, procurement by the *Régies* is furthermore subject to prior approval by the Directorate of Public Corporations and Privatization of the Ministry of Finance. This central government tutelage unduly lengthens and burdens routine *régie* operations, and fails to provide any useful counterweight to the local political pressures endured by the utilities.

128. **ONEP is accountable to the State for its annual activity program.** ONEP reports to a board chaired by the Ministry of MATEE, the proceedings of which are confidential. Neither annual program updates nor annual reports are public documents. ONEP's services to individual municipalities are ruled by agreements that amount to pass-through management contracts, with limited liability for ONEP. While no review of such contracts has been possible in the context of this report, it is generally understood that they do not contain performance obligations, nor any cost liabilities or penalties. ONEP's procurement is also subject to prior approval by Directorate of Public Corporations and Privatization, but ONEP is expected to be eligible for approvals a posteriori, since it can easily meet the conditions stipulated in recent changes to financial control procedures.

VI.2.2. Regulation of concessions

129. **The four concessions of Casablanca, Rabat, Tangiers, and Tetouan are entirely regulated by contract.** Their *Conventions de gestion déléguée* are of substantially identical structure, quite simple and concise in their concepts and clauses, with more complex provisions in extensive technical appendices. Underlying this relative simplicity is the recognition that for an undertaking as complex as a long-term multi-service concession with imperfect documentation of assets, costs, and revenues, there must be room for consensual interpretation (see next paragraph) and for evolution. A provision specifically allows consensual reopening of convention clauses every 5 years. Key regulatory instruments built into the conventions are summarized in Table 12.

Table 12: Summary of regulatory provisions applicable to private sector providers

Price cap	Cap on annual tariff increase (e.g., 3 percent)
Rate of return	A satisfactory rate of return is implied in the overarching provision that financial balance of concession must be maintained.
Hybrid (price cap with cost pass through)	Combination of: 1. cap on annual tariff increase (e.g., 3 percent) - pass-through of bulk water cost increases - adjustments for inflation - sharing of operating result in excess preset amount.
Non-negotiated or imposed interconnection and access rules	No, but obligation to achieve a preset number of social connections, and to aim at 100 percent service access by contract end. All expansions and new connections are funded through the Works Fund, not through concessionaires' funds.
Service obligations	By *cahier des charges*. Non-capped penalties apply
Service quality standards	By c*ahier des charges.* Non-capped penalties apply.
Standardized regulatory accounting system	Requirement to submit general, analytical and budgetary statements, per Morocco's accounting standards.

Available asset valuation	A comprehensive valued asset inventory is generally available (*fichier des immobilisations).*
Decision supported by an explicitly economic/ financial model	Availability and use of such a model by GOM is not documented. If available, use may be impaired by lack of analytical cost data.
Explicit consultation process for main decisions	Every 5 years, joint evaluation of contract performance and language, for potential amendment. No formal consultative or participatory process.

130. **Consensual approach to regulation by contract.** As a general rule, in administering concession contracts, the parties have been able to reach consensual decisions, due largely to the experienced managers and engineers serving in the Permanent Monitoring Committees. With their service-at-all-costs focus and their hands-on understanding of the operational, commercial, and political realities of utility service, they have been able to promote a constructive rather than defensive interaction with the concessionaire. This pragmatic approach has facilitated responsive service improvements and fast-track infrastructure upgrades, and is at the root of why the system works on the ground. The overdue renegotiation of the Casablanca concession, scheduled to occur on the fifth anniversary of the contract (2002) , is noteworthy in that regard.

131. However, some Permanent Monitoring Committees may lack the resources, skills, tools, or information needed to optimize the financial management of the contracts, especially in their medium and long-term dimensions. A better understanding of a concessionaire's cost structure, for example, would help optimize the final cost to the community of infrastructure upgrade programs implemented in part or in whole by the concessionaire itself. More proactive enforcement may also be needed to ensure that operators correct what is reportedly a chronic failure to comply with financial reporting requirements. A stronger focus on financial analysis and management seems particularly justified in preparation of fifth-year re-opener negotiations.

132. **Tariffs revisions.** The mechanisms applicable to concessions are straightforward, self-contained, and not contingent on deliberation by the Interdepartmental Commission on Prices (see section on tariffs, below). Adjustment needs are assessed once a year, on the basis of a cost-of-service analysis. Increases are capped at a set amount (e.g., 3 percent in Tangiers). In this regard too, however, some Permanent Monitoring Committees may suffer from asymmetry of information, and from the lack of capacity to conduct an in-depth evaluation of data and requests submitted by the operator.

133. **Obligations and penalties.** Operator obligations are described and quantified in terms of compliance, quality of service, responsiveness of service, asset maintenance, and system expansions and upgrades. Table 13 summarizes the basic expectations of the concession contract. Detailed obligations in terms of performance standards, levels of effort, and technical specifications are provided in technical appendices of the contracts.

Table 13: Principal obligations of concessionaires

General requirements	1. Improve quality of service to all clients 2. Ensure equity of access and service for all clients 3. Hire all existing staff 4. Minimize foreign staff, with planned replacement by Moroccans 5. Always provide the lowest cost services
Water supply obligations	1. Achieve a reliable, microbiologically safe water supply 2. Reduce non-revenue water 3. Improve access rates; aim to connect all urban neighborhoods

	4. Implement social connection programs 5. Achieve storage capacity for at least a 24-hour demand
Sanitation obligations	1. Improve sanitation systems and quality of service 2. Conduct collection system expansion and rehabilitation 3. Connect all houses already connected to water supply 4. Implement social connection programs 5. Install pollution control systems for environmental preservation

134. **Typical non-revenue water objectives are 20 percent after 10 years, and 15 percent after 25 or 30 years.** Concessionaire investment obligations are quantified, and accompanied by infrastructure objectives, performance criteria, and a list of priority projects to be implemented during the first 10 years. Specific uncapped penalties, among others, apply to performance shortcomings such as:

- Partial or total water service shutdown
- Non-compliant water quality
- Inadequate service pressure for more than 24 hours
- Local or area-wide sewer overflows
- Unavailability of sewage lift-station
- Process shutdown at wastewater treatment facility
- Unauthorized sewage bypass discharge
- Non-compliant treated effluent quality
- Delays in contractual infrastructure upgrades or expansions.

135. **Margin sharing.** Contracts stipulate that if, at the end of an overall profitable year, the concession's operating margin[38] exceeds a predetermined amount, 50 percent of the excess revenues are to be paid to the Works Fund.

136. **Dispute resolution.** Disagreements between the concessionaire and the Delegating Authority may undergo several conciliation steps, including, if necessary, a review by the Ministry of Interior. Ultimately, unresolved claims related to operational matters are to be brought to a Moroccan court of justice. International arbitrage is only an option for claims related to investments, bonds, and contract termination.

[38] Proceeds from operating sales and services minus operating costs.

VII FINANCING AND TAXATION OF THE SECTOR

137. **The composition of investments between 1993 and 2002 failed to reflect new sector priorities.** Over the period, Morocco invested some MAD 24 billion (US$2.4 billion) in the water supply and sewerage sector. With donor support, the country succeeded in mobilizing MAD 3.6 billion (US$330m), or 15 percent of the total, to jump-start public water supply in rural areas. It also managed to attract and retain private sector management and financing at a time of unfavorable market conditions for this type of transaction. Such successes contrast, however, with the financial fragility of the *Régies* and the delays in sewerage/pollution control subsector reforms. A breakdown of investments by source of funding is presented in Table 14, and by type of provider in Table 15. Government policies failed to address the sector investment needs in three main areas:

138. **Poor arbitration between investments for water production and treatment and for rehabilitation of water distribution networks.** The consistent dominance of investments in water production throughout the decade, while partly linked with drought-mitigation measures, suggests a significant inefficiency in resource allocation, especially considering that water losses (physical and commercial) in most water distribution systems are above 30 percent, and in several cases reach 40 or 50 percent. Over-investment in production ensured reliable water supply service in urban areas, despite the inability of many Régies, traditionally in charge of water distribution, to adequately maintain their networks and tighten their commercial practices. However, such investment may have unnecessarily increased the cost of service. As water becomes scarcer, the long marginal cost of new water production schemes will increase. Least-cost solutions will therefore be essential to meet the growing industrial and domestic demand. Forceful programs to effectively reduce water losses may be necessary in some cases, as well as arrangements with irrigation users to introduce more efficient, water-saving Clearly, new regulatory mechanisms will be needed to improve the coordination of investment decisions among those in charge of water resources mobilization (MATEE/DGH/river basin agencies), producers (ONEP), distributors (Régies and concessionaires), and eventually, irrigation users.

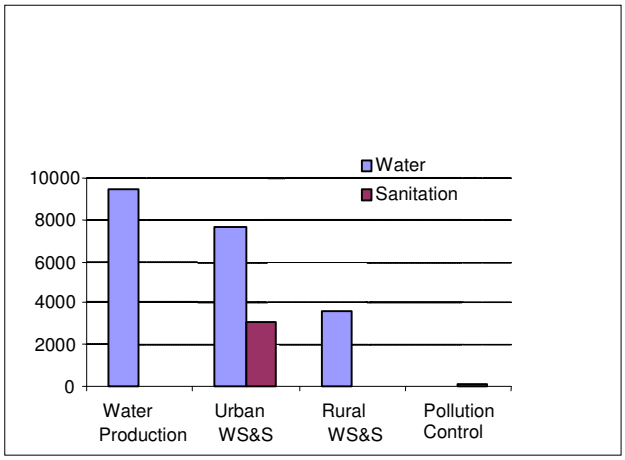


Figure 15: 1993-2002 Investments in Water and Sanitation sub-sectors

139. **Major underinvestment in pollution control**. Despite the Government's stated change of priorities from resource mobilization to pollution control and resource conservation, investment in sewage treatment was very weak during the period.[39]

Table 14: Infrastructure funding sources for the 1993-2002 decade (MAD billion)

	Potable Water Production	Water Distribution	Rural Water Supply	Sanitation	Total	percent
Subsidies (1)	1,13	1,51	2,64		5,28	22%
External grants		1,23	0,60	0,10	1,93	8%
External loans	3,84	0,88		0,44	5,16	21%
Local market loans	-	0,40		0,42	0,82	3%
Utility self-financing	4,77			0,28	5,05	21%
Beneficiaries of assets		3,64	0,34	1,87	5,85	24%
Total	9,74	7,66	3,58	3,11	24,09	100%

Sources: ONEP, DRSC et WB estimates. 1 MAD = US$ 0.106
(1) Includes transfers from electricity services

Table 15: Investment by operator and sub-sector, 1993-2002 (MAD billion)

Operator / **Sub-sector**	**ONEP**	**DGH**	***Régies* (13)**	**Concessions**	**Total**
Urban Water Supply:					
Production	9,74	-	-	-	**9,74**
Distribution	3,25	-	2,81	1,60	**7,66**
Rural water supply	1,13	2,45	-	-	**3,58**
Sanitation	0,53	-	0,92	1,66	**3,11**
Total	**14,65**	**2,45**	**3,73**	**3,26**	**24,09**

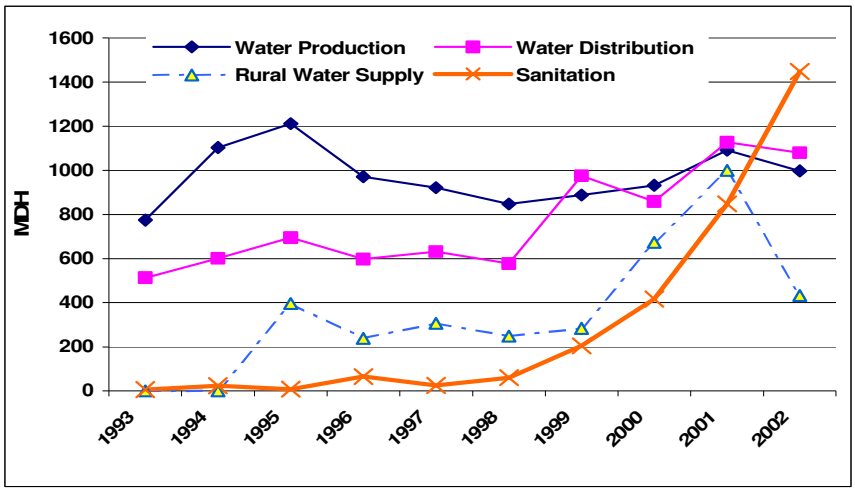
Sources : ONEP and DRSC, 1 MAD = US$ 0.106

[39] Due to lack of information the investment figures compiled exclude investments made by the *régies* of Casablanca and Rabat prior to their privatization. However, the overall trends would remain essentially the same if they had been included.

140. Overall, Morocco invested nearly eight dollars in water supply for every dollar invested in sewage collection and treatment. The investment in potable water production and treatment alone amounted to three times the investment for the entire sewerage sector. Investment in sewerage finally took off in the early 2000s, as shown in Figure 16. But the investments were mainly in sewerage collection systems, and did not address sewage treatment, which risks exacerbating negative environmental impacts.

Figure 16: Investment by subsector over the 1993-2002 decade

(MAD million)

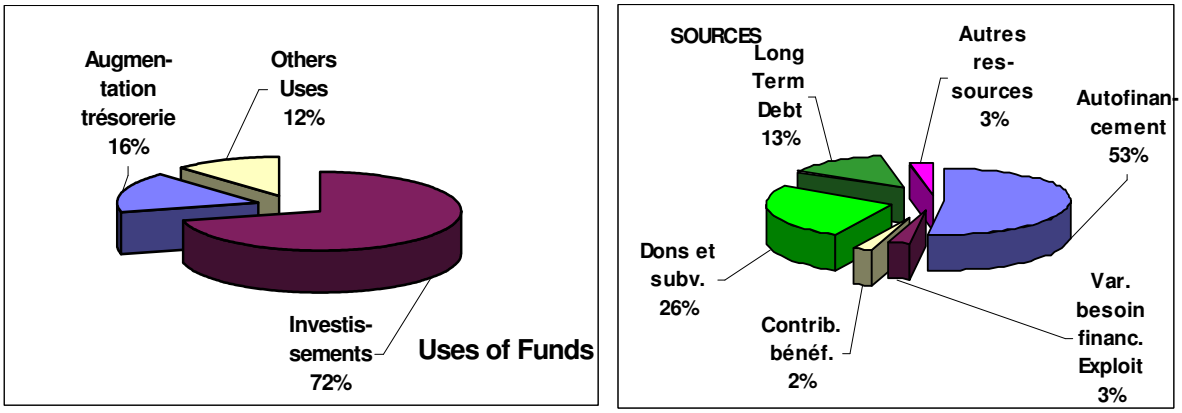


141. **Inadequate levels of investment in water supply and sewerage services in slums and informal settlements.** The needs of the poorest neighborhoods remained largely unmet over the decade, due to legal and financing constraints, land titling issues, and unaffordable connection charges; and to the fact that Morocco's urban policies have long focused on eradicating these settlements instead of trying to upgrade them and provide minimum levels of service and sanitary conditions.

VII.1 Financing Strategies of the Main Providers

142. **ONEP has a high self-financing ratio, and is the largest recipient of grants and Government funding.** Because of its special role in Morocco's water sector, ONEP benefits from unique sources of funding, for both its production and its distribution infrastructure. For decades, the Government paid for a portion of ONEP's capital investments for expansion of production capacity. ONEP stopped receiving Government funds for this purpose in 1995, but has started to collect two surcharges on the water tariff paid by private concessionaires and the *Régies*– a newly established solidarity surcharge and PAGER surcharge – which serve as cross-subsidy mechanisms that significantly contribute to ONEP's self-financing capacity. Ultimately, the clients of the private concessionaires and the Régies in large urban centers pay tariff surcharges for the benefit of ONEP's clients.

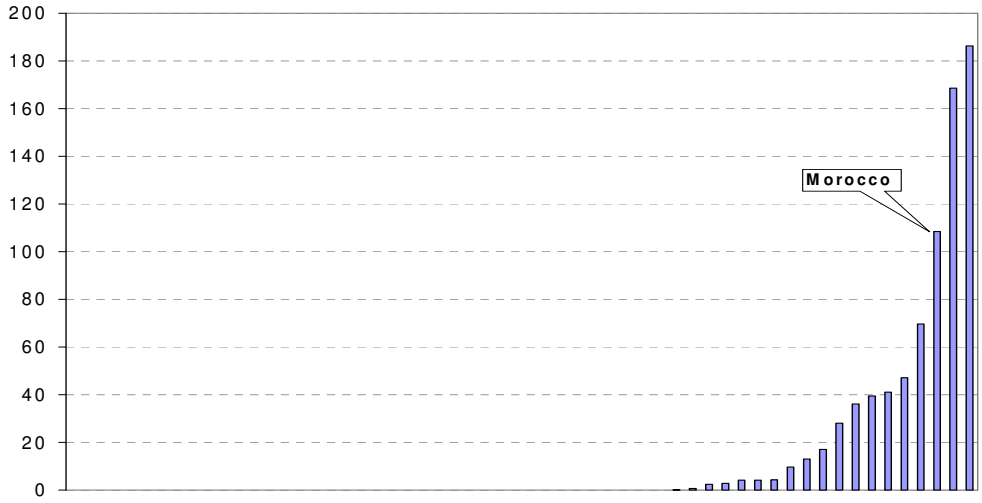
Figure 17: ONEP's sources and uses of funds – 1999-2001



Source: ONEP.

143. **Concession contracts with private operators are structured to allow multiple sources of financing for infrastructure investment.** The concessionaires' investment obligations are funded through the *Fonds du délegataire,* which is supported by the tariff. Other investment sources include the Works Fund (*Fonds de Travaux*), supported through capital contributions by developers and connection fees for new accounts, as well as any targeted government contribution. A remarkable feature of Moroccan concessions has been their ability to secure all of their private financing from local capital markets.[40]

Figure 18: Committed investment per capita in water and sanitation projects with private participation in lower-middle income countries



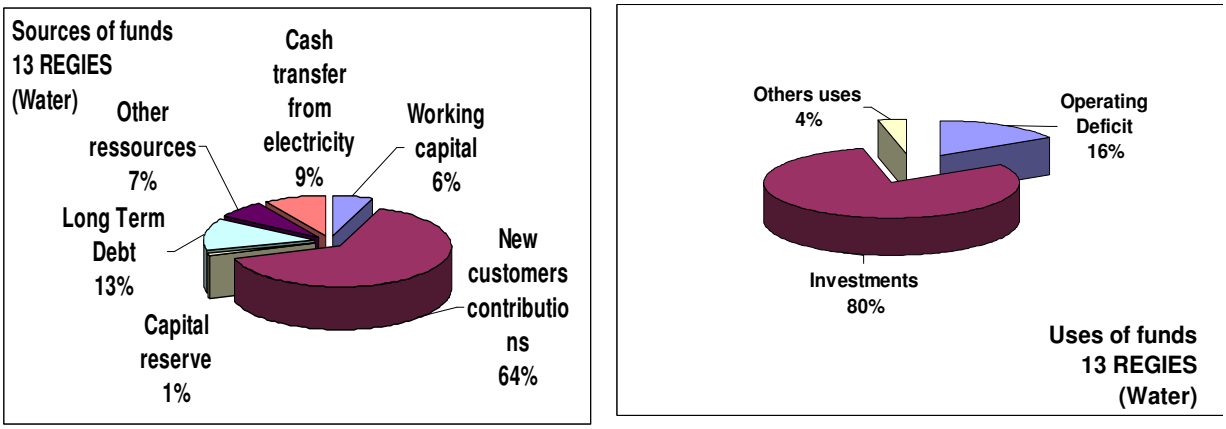
Note: Most countries have no investment in projects with private participation.

Source: World Bank Private Participation in Infrastructure database.

[40] In the most recent case, REDAL borrowed MAD 2.2 billion (about US$ 220 million) from the local capital market in May 2004 for a capital investment program of MAD 3.6 billion over 2004-08. The greatest share of the investment (MAD 2.1 billion) will be for sewerage collection and treatment.

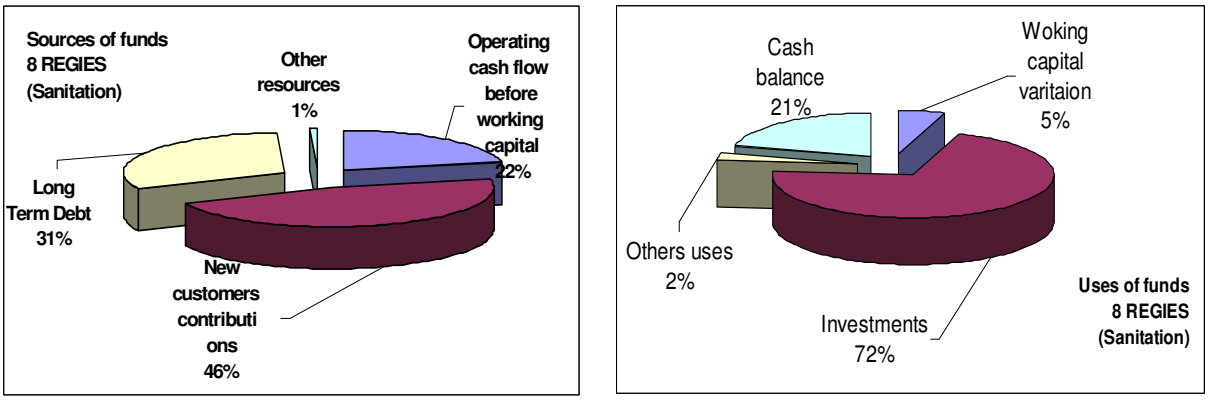
144. The *Régies* have an extremely low self-financing ratio and have historically relied on beneficiaries' contribution to finance systems expansion.

Figure 19: Sources and uses of *Régies'* funds (potable water), 1993-2002



Source: Directorate of Public Utilities and Concessions.

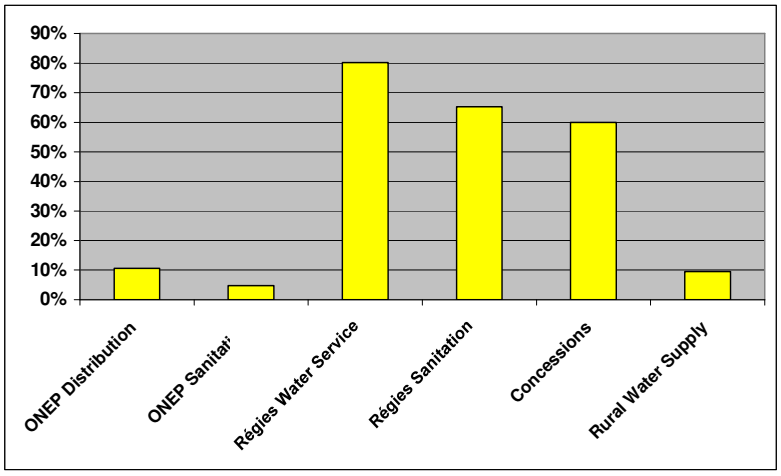
Figure 20: Sources and uses of *regies'* funds (sewerage), 1993-2002



Source: *Directorate of Public Utilities and Concessions.*

145. **Investment strategies are dictated by different regulatory mechanisms**. When it comes to mobilizing financing for capital investment, the *Régies* are in a situation of chronic dependency and underfunding. Their investment capacity for system expansion and upgrade is strictly linked to the health of the local real estate market, and to capital contributions (participations and connection fees) charged to real estate developers. This enables the *Régies* to augment its customer base along with formally zoned urban growth. This source of funding, however, is insufficient to fund infrastructure renewal and rehabilitation toward, among other efficiency and reliability goals, reducing water losses. It also makes formal housing more expensive. Such access fee contributions, which are not regulated by the Interdepartmental Commission on Prices, aim at compensating for inadequate revenues generated through tariffs. By comparison, the regulation by contract of concessions, which provides for tariffs sufficient to fund their investments, is much more effective in accelerating the pace of infrastructure expansion and rehabilitation, including the replacement of mains to reduce of water losses.

Figure 21: Beneficiaries contribution/Investment Ratio by provider category (1993-2002)



Source: Directorate of Public Utilities and Concessions.

VII.2 Taxation of the Sector

146. Private concessionaires and public utilities (ONEP and *Régies*), as commercial/industrial enterprises, pay corporate taxes on sales. Each service (water, sewerage, and electricity) is treated separately, with different tax rates for each of them. There is also a 7 percent value-added tax on water bills.

VIII TARIFFS AND PRICING

VIII.1 Tariff levels and structures

147. Morocco's formal urban water supply and sewerage cycle includes, on paper, five stages of pricing, which are summarized in Table 16, and further detailed in subsequent paragraphs. The river basin-based user fee system for water withdrawals and discharges is not yet operational as of 2004.

Table 16: Pricing stages in water supply

	Payers	Payee	Rates	Observations
Raw water withdrawal fee	ONEP (bulk production) *Régies*, concessions (self-production) Industrial & private withdrawals	River Basin Agency	Surface water MAD 0.04/m^3. Groundwater MAD 0.02/m^3.	Enforcement may start in 2004 on ONEP, *Régies* and concessions. Rate reduced by 20 percent if source is not a dammed reservoir or protected aquifer. Fee comes in addition to any cost incurred in mobilizing the water.
Bulk supply tariff	*Régies*, concessions Private bulk buyers	ONEP	Between MAD 2.28 and 4.13/m^3 .	Includes surcharges for small centers and PAGER. Sanitation surcharge pending.
Retail supply tariff	End customers of ONEP, *Régies*, and concessions	*Régie*, concession, or ONEP	Between MAD 3 and 7/$m^{3.}$ Varies by operator, customer category, and usage block.	Increasing block tariff, with fixed fee. First block insufficient to cover bulk purchase cost.
Sewerage tariff	End retail customers of ONEP, *Régies* and concessions	*Régie*, concession or ONEP	Between MAD 0.90 2/m3. Varies by operator, customer category, and usage block.	
Wastewater discharge fee	All sanitation operators, private dischargers	River Basin Agency	Variable, depending on pollution loads.	Provision yet to be implemented.

VIII.1.1. Raw Water Withdrawal Fees

148. **The Water Law introduced a fee for water withdrawals in the public domain**. Decree No. 2-97-414 of February 4, 1998 provides that this fee will be proportional to the volume withdrawn, corrected by a "source regulation coefficient," depending on its source. The proposed rate is MAD 0.04/m^3. Domestic withdrawals of less than 10 m^3/day, i.e. from typical traditional wells, or less than 200 m^3/day for a village, are only assessed an annual fee of MAD 250

(proposed value). The source regulation coefficient is 0.8 for water not controlled by a dam and for renewable groundwater (i.e., not from an over-pumped aquifer). In other cases it is 1.0. Accordingly the water withdrawal fee is calculated as follows:

$$R_{(AEP)} = t \times V \times c$$

with V = withdrawn volume, or authorized volume if not metered, in m^3
c = source regulation coefficient (1 or 0.8)
t = rate of MAD/0.04/m^3

VIII.1.2. Potable Water Tariffs

149. **Pricing principles.** The following key pricing principles apply to all water suppliers in Morocco:

- Separate tariffs will apply to water production and water distribution;
- Tariffs may differ from town to town, to reflect the need to recover local production and distribution costs;
- Distribution tariffs in communities served by ONEP (i.e., secondary centers) will benefit from intra-sector cross-subsidy *(péréquation)*;
- Tariffs may vary by user category – Residential,[41] Preferred,[42] and Industry;
- Proportional increasing block tariffs will apply to residential usage, along 4 blocks:
    - Block 1: less than < 8 m^3/month,
    - Block 2: 8 to 20 m^3/month;
    - Block 3: 20 to 40 m^3/month
    - Block 4: more than 40 m^3/month.
- **Production tariffs and surcharges**. ONEP's bulk potable water tariffs vary by location, and are regularly adjusted, as summarized in Table 17. In addition to aiming at recovery of production, operational, and capital costs, ONEP's bulk water tariffs also include surcharges earmarked for specific programs:
    - The **National Solidarity surcharge,** decided in 1985 and applied since 1992, is applied on the basis of MAD 0.74 for every cubic meter sold by ONEP[43] to the *Régies* and concessions. It is meant to fund the operating deficit of ONEP in small secondary urban centers, and made it possible for the Government to end its direct subsidies to ONEP's budget in 1995. This surcharge is ultimately passed on to all customers served by *Régies* and concessions (including the rural and peri-urban customers in the provinces served by *Régies*).
    - The **PAGER surcharge,** in place since July 1998, amounts to 5 percent of the bulk water tariff, and is aimed at funding rural water supply programs implemented by ONEP. It is paid by the *Régies* and Concessions, and passed on to their customers. In 2002, the average PAGER surcharge was around MAD 0.12 per cubic meter.
    - Introduction of a new **Sewerage surcharge** is under consideration by the Government to fund ONEP's sewerage and pollution control program.

[41] Residential category includes small businesses.
[42] Public baths, standpipes, and similar facilities.
[43] At current rates, MAD 0.74/m^3 represents an effective 25-27 percent surcharge.

Table 17: Evolution of ONEP's bulk water tariffs 1995-2000 (MAD/m³ before VAT)

City *MAD/m³*	April 1995		October 1995		July 1998		January 1999		November 2000		April 2003	
	Without/with surcharge		*Without/with surcharge*		*Without/with surcharge*		*Without/with surcharge*		*Without/with surcharge*		*Without/with surcharge*	
Agadir	2.15	2.71	2.36	2.98	2.48	3.10	2.50	3.27	2.50	3.31	2.82	3.65
Beni Mellal	1.21	1.77	1.34	1.95	1.40	2.02	1.41	2.13	1.41	2.17	1.60	2.37
Casablanca	2.51	3.07	2.76	3.37	2.89	3.51	2.90	3.70	3.10	3.95	3.28	4.13
El Jadida	2.76	3.32	3.03	3.64	3.18	3.79	3.19	4.00	3.19	4.04	3.28	4.13
Fès	1.52	2.08	1.76	2.37	1.84	2.46	1.97	2.72	1.97	2.76	2.23	3.03
Kenitra	2.51	3.07	2.76	3.37	2.89	3.51	2.75	3.54	2.76	3.58	3.10	3.95
Larache					1.78	2.39	1.78	2.52	1.78	2.56	2.02	2.81
Marrakech	1.65	2.21	1.82	2.44	1.91	2.53	1.92	2.67	1.93	2.71	2.18	2.98
Meknès	0.97	1.53	1.07	1.68	1.12	1.73	1.11	1.82	1.12	1.86	1.51	2.28
Nador	2.07	2.62	2.27	2.89	2.38	3.00	1.81	2.55	1.81	2.59	2.05	2.84
Oujda	1.21	1.77	1.34	1.95	1.40	2.02	1.41	2.13	1.41	2.17	2.68	3.50
Rabat	2.51	3.07	2.76	3.37	2.89	3.51	2.90	3.70	3.10	3.95	3.28	4.13
Safi	2.49	3.04	2.73	3.35	2.87	3.48	2.88	3.67	2.88	3.71	3.24	4.10
Settat	1.40	1.96	1.54	2.16	1.71	2.23	1.62	2.35	1.62	2.39	1.84	2.62
Tanger	1.34	1.90	1.52	2.14	1.60	2.21	1.69	2.42	1.69	2.46	1.91	2.70
Taza	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	2.23	3.03
Tétouan	1.54	2.10	1.69	2.31	1.78	2.39	1.78	2.52	1.78	2.56	1.90	2.69
Average	**2.04**	**2.60**	**2.31**	**2.93**	**2.39**	**3.01**	**2.44**	**3.21**	**2.55**	**3.37**		
Increase			**13%**	**13%**	**4%**	**3%**	**2%**	**7%**	**5%**	**5%**		

Note: The 1998 increase corresponds to the PAGER surcharge.
Source: ONEP.

150. **Retail water distribution tariffs and cross-subsidies.** Morocco's retail water distribution tariff structure includes three elements:

1. **A fixed fee component**, not linked to consumed volumes, is meant to recover fixed costs for connection and meter maintenance. It varies between MAD 2.50 and 6.00/month for residential customers, depending on the operator. The MAD 2.50 fee which applies to the *Régies*, has been frozen since 1977, and is therefore obsolete.
2. **A variable component,** with application of increasing-block rates. These tariffs have not been regularly updated, and have contributed to the *Régies*' deteriorating financial health. Block 1 is particularly unsustainable, with rates that do not even cover the cost of bulk water purchases from ONEP (e.g., they cover 60 percent of the bulk purchase cost in Fez). Block 1 applies to about 39 percent of total *Régies* sales, and its share continues to grow year after year, under a process known as "block sliding" effect *(effet de glissement de tranche)*. This form of subsidy for low consumption is not only ruinous for the financial health of distributors, but it is also inefficient, since it benefits all users instead of just targeting the neediest ones.
3. **Network access fees, consisting of an infrastructure participation fee and a connection fee**, which in most *Régies* are between MAD 2000 and 5000 for each of these charges, typically unaffordable for poor households. Many *Régies* have social connection programs in served areas, allowing connection fee payment by installments, thus facilitating access.

151. **A complex tariff structure with four consumer categories and four increasing block rates for residential and Government consumers**. In the late 1970s there were only two block

rates for these consumers, but a third block was introduced in 1982 and a fourth in 2000. Morocco's distribution tariff structures are further articulated along four customer categories (Residential, Preferred, Industries, and Government), as illustrated in Table 18 for a sample of private and public operators.

Table 18: Representative water distribution tariff structures (2003, before VAT)

Customer category	Tariff part	Unit	Operator			
			LYDEC	REDAL	RADEEF	ONEP
Residential	Fixed part	MAD/month	6.07	5.62	2.50	2.91
	Block 1 (<8 m^3/mo)	MAD/m^3	2.92	2.13	1.95	2.37
	Block 2 (8-20 m^3/mo)	MAD/m^3	9.96	7.21	7.07	7.39
	Block 3 (>20 m^3/mo)	MAD/m^3	13.20	10.83	8.79	10.98
	Block 4 (>40 m^3/mo)	MAD/m^3	13.25	10.89	8.84	11.03
Preferred	Fixed part	MAD/month	9.28	9.37	6.16	6.16
	Part variable	MAD/m^3	7.29	6.56	5.61	7.20
Industry	Fixed part	MAD/month	9.28	9.37	6.16	6.16
	Part variable	MAD/m^3	7.55	6.56	5.32	6.68
Government & administrations	Fixed part	MAD/month	9.28	9.37	2.50	2.91
	Block 1 (<8 m^3/mo)	MAD/m^3	3.40	4.19	1.95	2.37
	Block 2 (8-20 m^3/mo)	MAD/m^3	9.69	7.53	7.07	7.39
	Block 3 (>20 m^3/mo)	MAD/m^3	13.20	11.32	8.79	10.98
	Block 4 (>40 m^3/mo)	MAD/m^3	13.25	11.38	8.84	11.03

Note: Preferred category includes standpipes and public baths.

Source: Directorate of Public Utilities and Concessions.

VIII.1.3. Rural Water Supply Tariffs

152. Rural consumers make a one-time contribution of 5 percent of the capital investment costs required to bring potable water to their community. Under the water users association management model, water tariff rates are theoretically calculated to recover operation, management and minor repair costs. In practice, rates are usually set up at about MAD 10/m^3. Under ONEP's *gardien gérant* management model (private individuals in charge of each standpost), ONEP sells bulk water at a unit rate of MAD 2/m^3 to the *gardien gérant*, who then fixes his own retail tariffs to final consumers to maximize his profit. Consumer tariffs range from MAD 5/m^3 to 20/m^3, with an average of about MAD 8.4/m^3.

VIII.1.4. Sewerage Tariffs

153. **Volumetric sewerage pricing based on water consumption**. Sewerage pricing is established along the same lines as potable water, with a fixed part, a variable proportional part, with three increasing-rate blocks, and, for new clients, a one-time infrastructure participation fee and a connection fee. Representative tariffs for four operators are summarized in Table 19.

154. **Sewerage participation and connection fees are usually very high** for local consumers, approximately MAD 8,000-15,000 (US$ 800-1500) for each fee. Sewerage tariffs are

typically not aimed at recovering capital cost of infrastructure. In towns served by *Régies directes*, customers are not billed for sewerage service.

Table 19: Representative sewerage tariffs (2003, no VAT is applied)

Category	Subcategory	Unit	Operator			
			LYDEC	REDAL	RADEEF	ONEP (Khenifra)
Residential	Fixed part	MAD/mo.	4.64	3.5	3.08	3.08
	Block 1 (<8 m^3/mo)	MAD/m^3	0.86	0.44	0.51	0.46
	Block 2 (8-20 m^3/mo)	MAD/m^3	1.67	1.21	1.26	1.14
	Block 3 (>20 m^3/mo)	MAD/m^3	3.31	2.42	2.54	1.83
Government & administrations	Fixed part	MAD/mo.	10.12	7.0	6.16	6.16
	Variable part	MAD/m^3	2.82	2.42	2.54	1.14
Industry, Hotels and Public Baths	Fixed part	MAD/mo.	20.17	13.5	12.33	12.33
	Variable part	MAD/m^3	4.04	2.91	3.04	1.83

Source: Directorate of Public Utilities and Concessions.

VIII.1.5. Discharge Fee

155. **Introduction of an effluent discharge fee envisaged by the 1995 Water Law is still pending as of in mid-2004**. This fee would be levied by river basin agencies on public and private entities discharging water into the environment, and would go toward funding pollution control programs and infrastructure. However, both the fee and its implementation schedule remain to be defined. It is expected that the fee will be volumetric in nature, and variable as a function of the pollution loads in the discharged effluent. A feasibility study of municipal and industrial discharges in the Sebou River Basin led to an indicative fee of MAD 80/pollution unit discharged without treatment. If well-enforced and supported, this fee has the potential to act as a strong incentive for wastewater treatment by cities and industries.

VIII.2 Average unit water supply and sanitation prices

156. **Water and sanitation prices are quite heterogeneous across Morocco.** Private concessionaires and ONEP have the highest retail prices, as shown in Table 20. Their unit distribution rates are about US$ 0.73/m^3 and US$ 0.70/m^3 respectively, whereas *régie* unit rates range from a minimum of US$ 0.28/m^3 in Meknés to US$ 0.70/m^3 in Oujda, with an average of US$ 0.52/m^3. Rural consumer tariffs range from US$ 0.53/m^3 to US$ 2.13/m^3, with an average of about US$ 0.90/m^3. Lesser disparity is found among unit sewerage tariffs, but these are only about 22 to 28 percent of water tariffs.

Table 20: Comparison of calculated average water supply and sanitation unit prices (2002)

City	Operator	Average water supply unit price [1] (MAD/m^3)	Average sewerage unit billing rate [1] (MAD/m^3)
Casablanca	LYDEC	7.16	2.02
Rabat	REDAL	6.39	1.63
Tánger	AMENDIS	6.43	1.07
Tetouan	AMENDIS	6.55	1.15
Average concessions		**6.82**	**1.74**
Agadir	RAMSA	5.84	0.98
Beni Mellal	RADEET	4.94	1.72
El Jadida	RADEEJ	5.76	0 [2]
Fès	RADEEF	5.11	1.79
Kenitra	RAK	4.25	- [2]
Larache	RADEEL	4.07	- [2]
Marrakech	RADEEMA	5.06	1.52
Meknès	RADEEM	2.64	0.90
Nador	RADEEN	4.72	1.42
Oujda	RADEEO	6.55	0.80
Safi	RADEES	6.12	- [2]
Settat	RADEEC	5.18	2.02
Taza	RADEETA	3.09	- [2]
Average *Régies Autonomes*		**4.88**	**1.35**
Average concessions and *Régies Autonomes*		**5.90**	**1.59**
Other small towns & centers	ONEP	**6.58**	**1.50**

(1) Average tariffs include fixed fee

(2) *Régie directe* service to be transferred to *Régie autonome* in 2004. Unit rate forecast is 1,47 MAD/m^3.

Source: Directorate of Public Utilities and Concessions, 2002.

VIII.3 Subsidies

157. **There is no direct central government subsidy to the water supply and sewerage sector, except for capital investment contributions to PAGER and to sewerage collection and treatment**. Since its inception and up to 2003, the Government transferred about MAD 250 million/year (US$ 26.6 million/year) to the PAGER Investment Fund for rural water supply. A new subsidy was introduced in 2002 to promote investments in sewerage collection and treatment, which totaled MAD 100 million (US$ 10.6 million) in 2004. In the absence of formal allocation procedures, both subsidies largely benefit ONEP and the communities it serves. The increasing block tariff structure, with at least the first block level below the cost of providing the service, generates cross-subsidies among customers.

158. **Access subsidies**. Subsidies to facilitate poor households' access to the network are resctricted to social connections programs. Subsidies correspond to the difference between the market interest rate and the interest rate offered by social connections loan program. Under this program, and with average connection fees ranging from US$400 to more than US$1000 for each of the two services, water and sanitation providers offer poor households facilities to pay their connection fees in installments. The payment period can be from five to seven years and interest rates are usually between 6 percent and 7 percent, with some exceptions where no interest is paid. Given that the market interest rate is around 15 percent, a connection fee of US$500 paid over a five-year period represents a subsidy of around US$100 to the customer. In practice, public

providers bear this subsidy, unless, as in some cases, they themselves benefit from concessional loans from donors. Private operators finance this subsidy from the Works Fund, meaning that it is ultimately the delegating authority (the municipality) that bears the subsidy.

159. **Subsidies between operators**. Customers of *Régies* and private concessions subsidize ONEP customers through a "Solidarity" surcharge of US$0.074, which is paid on every cubic meter sold by ONEP to the suppliers. These subsidies generated a transfer of some US$45 million to ONEP in 2002. These transfers were initially meant to co-finance ONEP's expansion of water services in small and medium towns, but have been mainly used in recent years to finance operating and maintenance deficits of existing operations. These cross-subsidies are not ideally targeted, since poor customers supplied by the *Régies* and concessions pay the subsidy to non-poor customers supplied by ONEP. A second intra-sector cross subsidy mechanism is that of the PAGER surcharge, levied on *régie* and concession customers to fund rural water supply programs.

160. **Subsidies between consumption blocks**. Despite the lack of detailed information on the distribution of consumption, it is estimated that a large proportion of customers benefit from subsidies, and in some areas all customers pay an average price below the average cost. In the case of RADEEF, for example, the number of domestic users consuming less than 8 m^3 (the upper limit of the first tariff block) varies between 50 percent in winter and 40 percent in summer. Figure 22 shows monthly consumption distribution for the months of October 2002 and October 2003. It highlights a concentration of consumption around 10 m^3. It also shows that the distribution curve moved to the left between October 2002 and October 2003. This could be explained by two factors: on one hand, a large proportion of new users might have a low consumption since they correspond to those newly connected through the social connections program; on the other hand, a tariff increase in May 2003 might have influenced customers' consumption levels (elasticity of demand). In the same context, in October 2002, 41 percent of domestic customers consumed 10 percent of all water sold to domestic consumers, and contributed only 5 percent to RADEEF's revenues from this category of users. Further, 75 percent of RADEEF's revenues from domestic customers come from 25 percent of users. The Gini curve in Figure 23 shows the level of contribution of domestic users to RADEEF's revenues, and suggests there are significant transfers between users. At the same time, it was found that not only domestic consumers, but also administrative and industrial users, pay an average price below average cost. In other words, transfers between customers are not enough to cover the total cost of providing the service, nor are new customers' participation fees. Thus either operating and maintenance are not adequately performed, or the utility uses cash from the electricity service to complete funding of its water and sewerage operations, investment, and financing activities.

Figure 22: RADEEF's domestic customers' distribution in October 2002 and October 2003

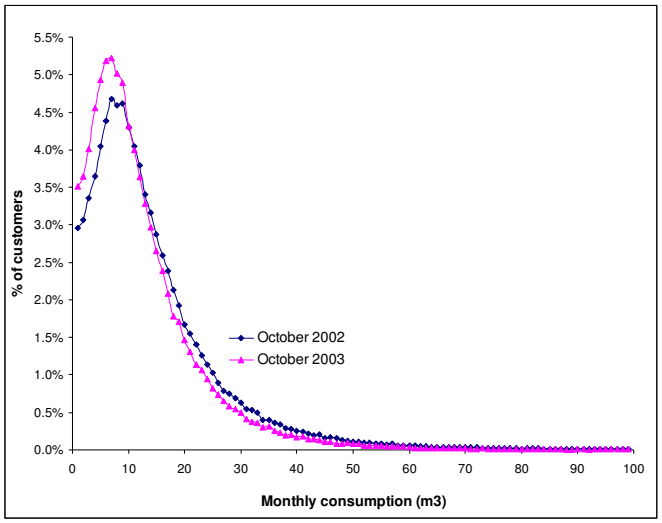
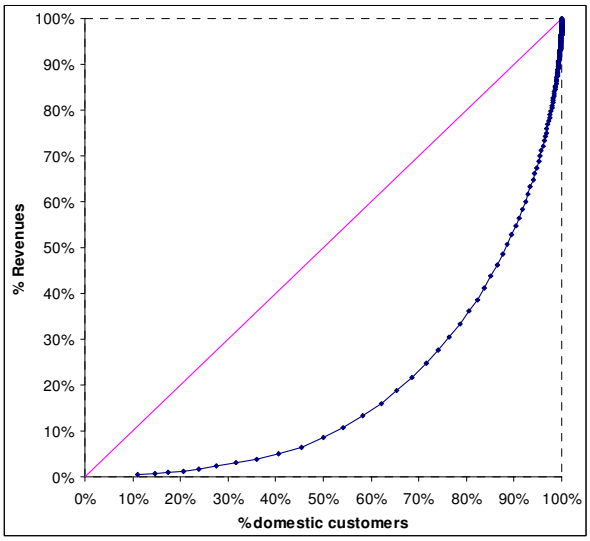


Figure 23: Gini curve for RADEEF's domestic consumption in 1994



Source: RADEEF, 1994, 2002 and 2003 commercial data.

161. **Despite the lack of incentives in the cross-subsidies of the current tariff system, the achievements of operators in urban areas are remarkable**. When subsidies are not adequately designed, they do not encourage operators to extend into high-cost areas or poor regions (Clarke and Wallsten, 2002). Every time a group of users is priced below cost, the operator has little or no incentive, and sometimes not even the financial capacity, to service those users. Morocco's public and private providers have, however, achieved a good access level in urban areas, due in part to the social connections program, and in part to the positive incentive of being able to collect considerable participation fees when they expand service to new areas. This has not been achieved without a negative impact on the average tariff, because this service expansion, combined with the freeze of the level of the first tariff block, has shifted a large part of the consumption to this first block. Private concessions in Casablanca and Rabat do not however experience this same effect, as their average tariff is adjusted periodically. The concession

contracts in Tanger and Tetouan do not have such an adjustment mechanism, as the tariffs for each block are adjusted instead of the average tariff.

VIII.4 Current rules for tariff adjustment

162. **Tariffs for drinking water and sewerage service are controlled by the Government**. These services are included in an annex to the *décret* of 17 September 2001, applying the Law on Competition and Prices of June 5, 2000.[44] Related services such as connecting a customer to the network are, however, unregulated. The décret's and the Law's provisions on water are described as temporary, valid until 2005, suggesting that in a near future, public operators and their boards may be able to decide tariff adjustments.

163. **The rules governing the adjustment of tariffs depend on the nature of the provider**. Table 21 summarizes the rules, by provider, under the following nine headings:

- *Primary decision-maker*. Who has the right to determine tariffs in the first instance?
- *Timing*. Are decisions scheduled regularly or made on ad hoc basis?
- *Proposal*. Who has the right to propose unscheduled changes in tariffs?
- *Substantive constraints*. What substantive rules or guidelines must decision makers follow?
- *Compulsory opinions*. Who must provide an opinion before decisions are made?
- *Other advice.* Who else provides advice? What skills do they have?
- *Transparency*. Who has the right to be informed of the rules, decisions, and reasons for decisions?
- *Consultation*. Who has the right to be consulted before the decision is made?
- *Appeal*. Who has the right to appeal the decision and on what grounds? Who makes decisions on appeal?

Table 21: Characteristics of current rules in Morocco for adjusting tariffs

	Concessions	**ONEP and *Régies Autonomes***
Primary decision-maker	Decisions are made jointly by the provider and the conceding authority—either directly or by the *comité de suivi* on which they are both represented. Public authorities can, in certain circumstances, change tariffs unilaterally, on condition that they compensates the provider for consequent losses. See Annex 2	Decisions are made unilaterally by the *Premier ministre* or government authority delegated by him.
Timing	The contracts call for annual or other periodic decisions on tariff-adjustment	Decisions are made in response to proposals, whose timing is *ad hoc*.
Proposal	The concessionaire and the conceding authority can propose changes.	For ONEP, its *conseil d'administration*. For the *Régies*, the *conseil d'administration* and the *Ministère de l'Intérieur* acting jointly

[44] The Law provides for regulation of prices charged by monopolies. However, the legal basis for the regulation of water is a transitional provision that will expire in 2005.

Table 21: Characteristics of current rules in Morocco for adjusting tariffs

	Concessions	**ONEP and *Régies Autonomes***
Substantive constraints	Changes are constrained by substantives rules in concession contracts and surrounding law, including mathematical formulas and general rules (such as to maintain "*équilibre financier du contrat*").	There are few substantive constraints. The proposed *Circulaire* would impose some very general guidance.
Compulsory opinions	None	The *Commission interministérielle des prix* must provide its non-binding opinion. The recommendation does not bind the decision-maker.
Other advice	The representatives of the Delegating Authority can generally get advice from a small Permanent Monitoring Committee of technical advisers (mostly engineers). The Ministry the Interior also provides advice.	
Transparency	Once tariff adjustments have been determined (by the process set out above), the concessionaire must inform various government authorities at least 30 days before the change. Customers and others have a legal right to view concession contracts, but in practice may not find them easy to obtain: for example, they are not published or available on any website. There are no requirements to publish reasons for decisions about tariff changes.	Rules and decisions are published in the *Bulletin Officiel*. There are no requirements to publish reasons for decisions about tariff changes.
Consultation	There are no requirements to consult customers or other third parties. (In practice, customers' views are fed into the decision indirectly through involvement of elected representatives.)	There are no requirements to consult customers or other third parties. (In practice, customers' views are fed into the decision indirectly through involvement of elected officials.)
Appeal	Parties to the contract can seek to resolve disputes in Moroccan courts, and, in some cases by arbitration in Morocco according to ICSID (*CIRDI*) rules. Customers and others could appeal decisions to Moroccan courts.	No appeal by providers is envisaged. Customers could appeal to Moroccan administrative courts.

164. **In practice, regular tariff adjustment decisions can be quite infrequent for the *Régies autonomes***. As indicated in Table 21, an important characteristic of the tariff adjustment rules is that decisions on tariff adjustments for the *Régies autonomes* are not scheduled regularly, but made only in response to proposals. Furthermore, the *Régies autonomes* do not have the power to make such proposals on their own; the Ministry of Interior, which is represented on the

board of the *Régie*, and is also responsible for law and order in Moroccan cities, must endorse the proposal prior to its submission to the Interdepartmental Commission on Prices. Political concerns at various stages of this process may have contributed to infrequent tariff increases.

165. **The Government has the authority to adjust tariffs for reasons of public interest, so long as it compensates the concessionaire for any consequent losses**. Another peculiarity of Morocco's current rules is that although concessions mostly require joint decision-making on tariffs, through application of contract provisions, the Government retains certain powers to make unilateral decisions, in particular for reasons of public interest. However, the requirement for compensation makes this decision-making arrangement similar to joint decision-making.

Recent Proposals for Reform

166. **Various proposals have been made to reform the rules governing tariff adjustment.** Reports by Loir and Guislain (1997) and PricewaterhouseCoopers (2001) have recommended a number of changes, including the creation of an independent or at least financially autonomous regulatory agency (*organe de regulation).* Following those reports and other deliberations, the Government drafted a *Loi sur les concessions* aimed at changing some of the rules governing private concessions over central government infrastructure assets, and thus, indirectly, some of the rules governing tariff adjustment.

167. The Ministry of General and Economic Affairs and the Ministry of Interior are also developing proposals for water and sanitation tariff setting methodologies. A consulting firm, Service Public 2000, has been mandated by the Government to assess and propose water and sanitation tariff strategies. Extensive reform of regulation capacity and the tariff structure would also be needed if the Government adopts the recommendations of the ongoing study for restructuring of operators, which focus on the consolidation of urban and rural providers into a small number of critical-size regional water and sanitation utilities. The Ministry of interior is further pursuing the development of a law to rule delegation of services by local governments to public or private operators, which would touch on tariff and performance regulation.

VIII.5 Assessment of current rules and outcomes

168. **Tariff rules can be judged by whether they ensure that decision-makers have good incentives, information, and capabilities—and are perceived as fair**.

- Table 21 suggests that tariff adjustment rules for the concessions give decision-makers strong incentives to take account of the providers' interests and therefore to adjust tariffs in ways that serve Government's goals of encouraging investment and discouraging waste—as well as its distributional goals. On the other hand, tariff adjustment rules for ONEP and, especially for the *Régies autonomes*, do not provide equivalent incentives, and may contribute to insufficient tariff increases for these public providers.
- In terms of information, decision-makers appear not to have good information on either customers' preferences or relevant aspects of provider performance.
- In terms of capability, there is considerable expertise and experience, among others, in the Ministry of Interior and the Interministerial Pricing Committee, as well as in ONEP and some local governments. At a professional level nevertheless, expertise is often much stronger in utility operations and engineering, than in finance and economics.
- It is difficult to gauge public perceptions of the fairness of the tariff adjustment rules. As in most other countries, tariff increases are controversial and unpopular—the demonstrations caused by tariff increases in Tetouan being a recent example. Given public concerns about

corruption in Morocco (Transparency Maroc, 2001a and 2001b), it would not be surprising if concerns about corruption in tariff adjustment for private providers were widespread.

169. **All things being equal, good rules should usually lead to good outcomes**. In particular, they should help ensure that:

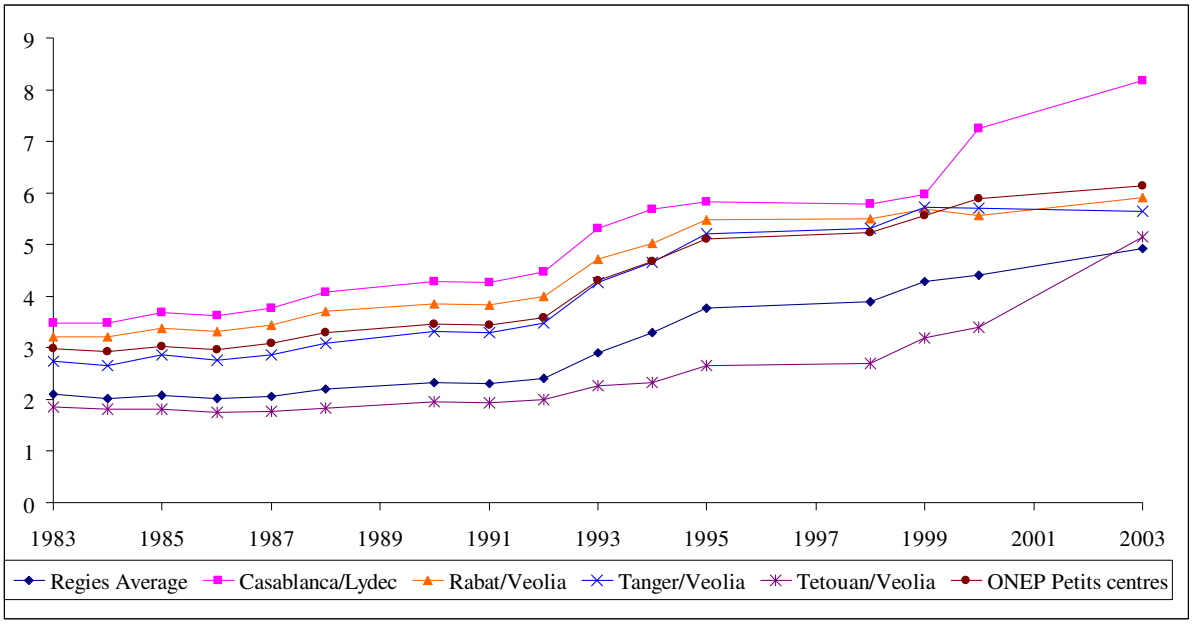
- Over the long term, prices roughly correspond to costs, except for services that governments have deliberately chosen to subsidize;
- Rates of access to safe water and sanitation facilities are high,
- Private investors have sufficient confidence to invest when investment is appropriate, and non-commercially motivated providers have the resources to invest appropriately.

170. **Morocco has achieved considerable success under each of the above criteria**. Water for all customers, except those served by *Régies directes,* is priced based on the volume of water consumed, so almost all customers have at least some incentive to conserve water. Tariffs also allow for differences in prices by location, according to differences in production and distribution cost. On the other hand, even though average prices have increased significantly in real terms over the last decade, as shown in Figure 24, they remain too low to cover costs. Prices for irrigation water and for domestic Block 1 are well below costs, and the implicit subsidies do not seem to be targeted in ways that meet the Government's objectives. Finally, current differences in price by location may not reflect actual differences in cost.

171. **Rates of access to water have risen rapidly over the last two decades**, and, if current plans for further increases in access are achieved, these rates will be high for a country of Morocco's income. In sanitation, on the other hand, current rates of access are low.

172. **Current rules have failed to serve the *Régies* well, but have attracted significant private investment financing**. While private investors and advisers express concerns about the tariff system, improvements appear possible, and private investors have been sufficiently confident to commit to major investments. According to World Bank's Private Participation in Infrastructure database, among 56 lower-middle income countries, only Belize and Cape Verde have attracted more investment than Morocco in water and sanitation projects with private participation (see Figure 18). ONEP and some *Régies autonomes* have had sufficient resources to make investments in the recent past, but some *Régies autonomes* are struggling to find much-needed financing and ONEP's future position is unclear.

Figure 24: Change in average unit price before value added tax for selected operators (in constant 1995 MAD/m³)



Source: Service Public 2000; World Bank 2004.

IX INVESTMENT REQUIREMENTS IN WATER AND SANITATION

IX.1 Government Sector Objectives

173. **Ambitious Government objectives for water supply and sewerage**. These objectives are as summarized in Table 22, and largely exceed the Millennium Development Goals over the 2007-2015 timeframe. The following discussion focuses on the objectives for the next four years (2004-2007), which are reflected in ONEP's and the *Régies*' annual programs, and in the concessions' contractual investment obligations.

Table 22: Government of Morocco's water infrastructure service objectives

Subsector	Service objective
Urban Water Supply	o Achieve 100 percent urban water supply coverage (consistent with national program to eliminate unhealthy precarious neighborhoods). o Reduce non-revenue water to 25 percent by 2006 (20 percent by 2008). This should result in a gain of 120 million m^3, which could cover demand growth until 2010.
Urban Sanitation and Pollution Control	o Expand access in small urban centers, transferring infrastructure development and operations to ONEP. o Treat municipal and industrial wastewater toward 60 percent reduction of polluting loads by 2010 (80 percent by 2015).
Rural Water Supply	o Achieve 92 percent access by 2007 (from 50 percent coverage in 2002), with ONEP solely in charge of subsector programs.

IX.2 Financing Needs

174. **Doubling the annual rate of infrastructure investment, as required to meet the goals for 2004-2007, will vastly exceed the sector's current self-financing capacity.** These financing requirements are estimated at MAD 30.7 billion (US$ 3.3 billion), or more than double the sector-wide investment in the preceding four years (MAD 13.3 billion, or US$1.3 billion, in 2000-2003). A breakdown of investment needs by subsector and operator, and a comparison with the previous four-year period, is shown in Figure 1. Achieving such goals appears unrealistic without reforms to tariff systems, tariff and performance regulatory mechanisms, sector governance and subsidy allocation.

175. **ONEP is expected to assume the bulk of the increased investment.** Available financial simulations point to substantial residual financing needs, even under the most optimistic assumptions of planned tariff increases and efficiency gains on the part of *Régies*. For ONEP, the financing gap is an estimated MAD 7.2 billion (US$770 million) over 2004-2007, which would threaten its financial viability. Alternatively, ONEP could attempt to transfer the burden of

mobilizing the required financing to its bulk water clients, private concessionaires, and *Régies*, through huge increases in the tariffs for production and other surcharges. However, this strategy, too, would be untenable, unless the *Régies* can strengthen their financial position.

176. **The *Régies* would also face a considerable financing gap**. Financial projections for the *Régies* over 2005-2014 show that without tariff adjustments and performance improvements, internal cash generation from operating activities and new customer participations would barely cover 6 and 12 percent of investment needs in the water and sewerage sectors (estimated at about US$60 and US$80 million for water and sewerage, respectively). The projections also show that increasing the two sectors' internal self-financing capacity – by requiring that at least 40 percent of investment needs be covered through tariffs and new customers' participation, and the rest through debt – would mean that the current tariff level for water would have to be increased by at least 5 percent a year after inflation. At the same time, the average sewerage tariff would need to more than double in the first years of that period.

177. **Absorptive capacity constraints, especially in rural areas.** The exceptional acceleration in capital investments also raises the question of capacity of the operators and the Moroccan water industry in general. The sheer volume of the program begs the question of how owners, program managers, designers, and contractors will manage to effectively absorb the project load. Strained planning, design, and implementation capacities carry a risk of low cost efficiency, quality, and sustainability. The risk is substantial in rural water supply, where the pace of investment has to be tripled, and where capacity is currently low, assets are dispersed, and ad hoc structures would need to be set up ensure their proper use and maintenance by the community, which are essential for sustainable operation. The rapid implementation of water supply schemes may be incompatible with this demand-driven approach.

178. **Limits of current financing mechanisms.** Cost recovery varies significantly across subsectors. It is high in water production, and in large distribution and sanitation operations, and much lower in small center operations and in rural supply. Direct cross-subsidy mechanisms such as the solidarity and PAGER surcharges have so far successfully replaced direct general budget subsidies; but their basis, i.e., bulk potable water sales to *Régies* and concessionaires, is not growing, and may actually shrink as distributors become more efficient. Further increasing the surcharge rates is problematic, since its forces the *Régies* and concessionaires to adjust their tariffs to fund both their own and ONEP's capital programs – ultimately a questionable and unsustainable load on urban customers, given the massive sanitation and pollution control needs ahead. The current solidarity and PAGER surcharges already add about 20 percent to the pass-through costs of the *Régies* and the concessions. Finally, and importantly, the surcharge system carries some substantial inequality, since it forces urban dwellers to subsidize infrastructure in rural and small centers before they can afford their own. This distortion can be significant, depending on whether the center is served by ONEP or a *régie*. These problems would only be magnified in the event that a new solidarity sanitation surcharge were introduced, as currently proposed by ONEP.

179. **Limits of internal and inter-sectoral cross-subsidies**. Cross-subsidies between electricity and water/sanitation activities are the norm in multisector utilities. Their impact may however be reaching their limits for the *Régies*. Evidence of that is that water and sanitation activities of multisector *Régies*, do not consistently achieve better cost-recovery than for water & sanitation-only Régies. In other words, with unreliable tariff adjustments, internal cross-subsidies cannot outweigh the inadequate gains in operating efficiency and management performance of most Régies. .Electricity-to-water cross-subsidies are however believed to be essential to the

financial planning of private concessions, although specific analytical data to this effect could not be reviewed. ONEP, for its part, benefits from generally favorable tariff regulation for its bulk water pricing. There are no regulation mechanisms governing ONEP's investments, and the flow of surcharges doubles its self-financing capacity, and frees ONEP from annual budgetary capital and operating subsidy requests. However, at a time when ONEP faces growing investment needs in rural water supply and in sanitation infrastructure, it is also faced with a structural challenge – the stagnation, and even decline of its only profitable activity, the bulk potable water sales to large cities.

180. **Lack of adjustment mechanisms to reconcile the objectives and financing capacity of the sector.** The use of realistic financial models would help reconcile the sector's financing capacity with the Government's objectives. Sound models are needed for optimal investment strategies, targeting of subsidies, and design of regulatory mechanisms. To the extent that the realization of Government objectives implies a significant injection of central government budget subsidies or other external funding mechanisms, the preparation of sector investment programs should be preceded or accompanied by inter-ministerial consultations and public expenditure reviews, to determine the highest priorities for the sector.

IX.3 Investment opportunities for the World Bank Group

181. In light of the Government's objectives and the challenges facing the sector, and contingent on actual Government requests, the World Bank Group could provide assistance in one or several of the following areas, using its full range of products (lending with or without Government guarantees, guarantees to private investors, technical assistance, capacity building, and analytical work):

182. **Assistance in implementing sector policy reforms,** through a combination of analytical work, technical assistance, and possibly structural adjustment lending to support a water sector Public Expenditure Review, drafting of new legislation, design of contractual and regulatory instruments, development of reliable tariff and revenue strategies, other economic and sector work.

183. **Technical assistance to support the establishment of proposed new institutions**, such as an autonomous regulatory agency or regional operators; or to expand the capacities of existing institutions, such as Directorate of Public Utilities and Concessions and the river basin agencies.

184. **Rural water supply and sanitation**. The Bank plans to support further implementation of the Government's PAGER program to identify the most sustainable technical and management approaches, and find ways to tie them to rural sanitation and hygiene education. Since ONEP is the designated partner for rural water supply, infrastructure initiatives may be coupled with capacity building efforts geared at improving ONEP's analytical cost and financial reporting capabilities, for regulatory purposes.

185. **Water and sanitation access for the urban poor.** Targeting poverty in urban areas is a second major, and another possible priority for WB involvement. In collaboration with urban habitat upgrade programs, the Bank may support classic and innovative approaches for service delivery to the urban poor in slums, traditional neighborhoods, and peripheral illegal developments. In coordination with the Government and Ministry of Habitat, Output Based A-type collaborations (Output Based Aid) with various public and private operators may be identified, to create connection fee financing facilities and development of service solutions based on appropriate technologies and levels of service.

186. **Pollution control, and integrated water quality management**. As part of integrated water resources management, pollution control investment needs represent a considerable challenge for Morocco. This is an area where World Bank lending could be effective at both jump-starting river basin agency operations, and at addressing the most urgent point-source pollution and contamination problems caused by inland *Régies* (e.g., in the Sebou basin), and by private industries. Concurrently, significant opportunity exists to strengthen collaboration with *Régies* and ONEP in developing sustainable sanitation and pollution control solutions. In addition to the establishment of sustainable technology and management practices, Bank lending could promote the overdue development of water reuse in Morocco for agricultural and industrial applications, as well as for groundwater recharge. Finally, the expected rapid development of the wastewater treatment subsector raises significant operational learning curve concerns. World Bank lending may help mitigate such risks by promoting operational capacity building and private sector participation in wastewater treatment.

187. **Investment in building the capacity of public operators.** Acknowledging the fact that private sector providers are not an universal solution to Morocco's urban water supply and sanitation needs, opportunities exist to assist public utilities in improving their capacity for: (a) demand management and non-revenue water reduction; (b) utility management (customer service, bill collection, asset management); (c) regulatory reporting; and (d) financial planning systems. Some of these tasks could be served by an OBA implementation approach.

APPENDIX 1. TECHNICAL PERFORMANCE OF THE WATER AND SANITATION SECTOR

The Technical Snapshot

188. **While significant variations may exist between utilities, Moroccan urban water supply providers deliver with rare exceptions, water service that is reliably continuous and of potable quality**. Sanitation operations by comparison seem to suffer from relative neglect, due essentially to the lesser development of infrastructure and technical expertise. It is thus estimated that 30 percent to 50 percent of sewage collection capacity is lost to sewer clogging and failure. Selected sector-wide performance indicators are summarized in Table 23.

Table 23: Aggregate performance indicators for water supply sub-sector (2002)

Water Supply Time (hours/day)	Urban: 24hr/day[45] Rural: n/a
Non-revenue Water (percent)	34.0 percent
Time spent by unconnected customers for water collection	Generally less than 15 minutes, in both urban and rural areas (3).
Commercial Perception of Water Service	Index not available for Morocco
Urban Water Effectively Disinfected (percent production)	Urban: 100 percent (estimated) Rural: n/a
Urban Wastewater Treated (percent Wastewater)	7 percent (2)
Rural Water Supplies that are Functioning (percent total supplies?)	80 percent (2)

(1) All utility distributed water is chlorinated
(2) Source : European Union (2003) Water Sector in Morocco
(3) *Also see figure 12.*

Operating performance

189. **Contractualization of performance.** A relatively uniform approach to specifying operator obligations is found across the four concessions, and typifies the Moroccan experience of service delegation. Operator obligations include general requirements as well as subsector-specific requirements, for water, sanitation and electricity service (also see discussion of

[45] All *Régie*s and concessions provide round-the-clock water service. A reported exception is RADEEO (Oujdah) which systematically shuts down service at night.

Concessions, in section 2). Detailed quantitative criteria apply. Services by the *Régies* and ONEP are not subject to similarly enforceable performance obligations.

190. **Non revenue water ratios vary extensively between providers**. In aggregate across all providers, non revenue water in 2002 amounts to about 33 percent water entering the distribution systems. Table 24 shows how these ratios vary from an estimated 47 percent for the less performing providers (RADEEF, RADEEO, Amendis-Tetouan) to about 20 percent for the best in class (RAMSA, RAK). Available data is insufficient to assess the quality and homogeneity of these figures, and to separate the contributions of physical losses and of metering & billing losses. The three concessions in Rabat, Tangiers and Tetouan saw their distribution efficiency drop significantly during their first year of operation (2002). Rather than abysmal performance by the new operator, the explanation may lie in measurement inaccuracies and non revenue water underreporting by previous "*Régies*".

Table 24: Non-revenue Water ratios for Morocco's urban providers (2002)

	2002				**2001**
	Water in Mm3/yr	Water out (sales) Mm3/yr	**NRW ($1- W_{out}/ W_{in}$) percent**	Efficiency W_{out}/ W_{in} percent	Efficiency W_{out}/ W_{in} percent
LYDEC (Casablanca)	159.3	114.3	**28.3**	71.7	69.7
REDAL (Rabat)	85.5	58.4	**31.6**	68.3	75.0
AMENDIS (Tétouan)	33.6	17.8	**47.2**	52.8	57.9
AMENDIS (Tangiers)	38.1	24.2	**36.6**	63.4	67.2
Total Concessions	*316.5*	*214.6*	***32.2***	*67.8*	*69.7*
RADEEF (Fes)	69.7	37.2	**46,7**	53.3	51.3
RADEEMA (Marrakesh)	45.7	31.0	**32.2**	67.8	65.7
RADEEM (Meknés)	34.8	22.6	**35.0**	65.0	66.5
RAMSA (Agadir)	26.9	21.4	**20.4**	79.6	79.8
RADEEO (Oujdah)	22.9	12.1	**47.0**	53.0	54.0
RAK (Kenitra)	21.0	16.3	**22.4**	77.6	76.7
RADEEJ (El Jedida)	17.9	11.5	**36.0**	64.0	63.0
RADEET (Beni Mellal)	14.8	9.0	**39.0**	61.0	58.0
RADEEL (Larache)	14.1	8.8	**38.0**	62.0	61.0
RADEES (Safi)	10.6	7.6	**28.0**	72.0	73.0
RADEETA (Taza)	8.6	4.9	**43.8**	56.2	55.1
RADEEC	8.0	6.5	**29.0**	81.0	80.4
RADEEN (Nador)	4.6	3.4	**25.0**	75.0	80.0
Total Régies	*299.6*	*192.2*	***35.8***	*64.2*	*63.2*
ONEP[46]	198	135	**31.1**	70.2	69.9
Total	*814.1*	*541.8*	***33.4***	*66.5*	*66.5*

Commercial Performance of Utilities

191. **Characterizing the performance of Moroccan operators, in terms of operations, investments and return on capital is challenging, essentially for lack of reliable or adequate**

[46] Efficiency of ONEP bulk transmission system was estimated at 96% in 2001.

data. Many *Régies* simply issue non-audited results, based on uncertain fixed asset evaluations and unclear depreciation assumptions. For the concessions on the other hand, in spite of contractual obligations, Direction des Régies et Services Concédés is not enforcing the analytical accounting reporting requirements. Finally, ONEP financial information was not made available in a form suitable to separately analyze its various activities.

192. The succinct analysis in subsequent paragraphs is therefore based on available data and the following assumptions:

- Depreciation is taken as the linear spread over time of operator investments, according to applicable accounting practice. AMENDIS features very low depreciation levels, because transferred assets carried no depreciation liability. Depreciations will build up as AMENDIS invests.
- A plausible order of magnitude for return on capital is taken a 1.50 times depreciation, based on ratios observed in other foreign multi-utility markets– except for AMENDIS which is hypothetically assigned a weighted average of other Moroccan operators calculated return on capital.

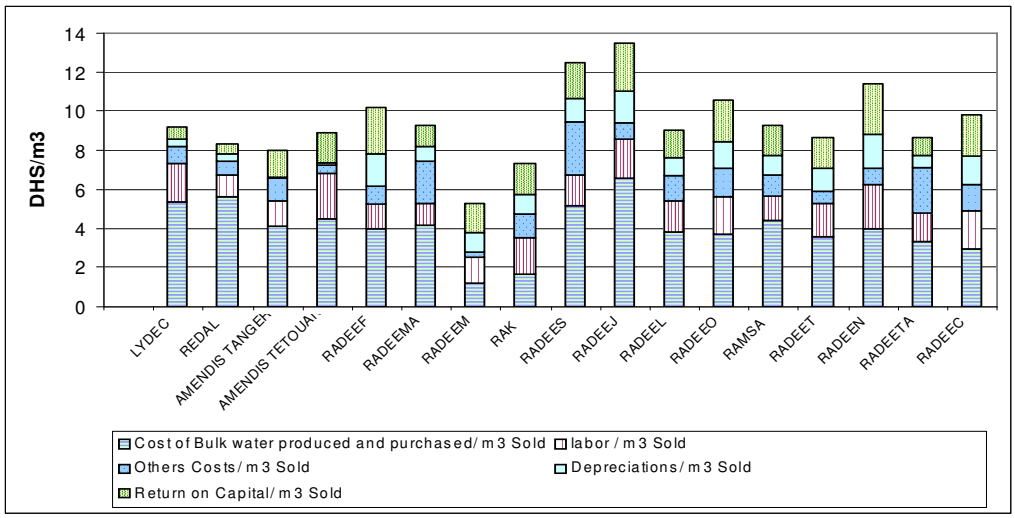
Water supply costs analysis

193. Such analysis was conducted with data available for the 4 concessions and the 13 *Régies*. It could not be preformed for ONEP. Figure 25 shows costs varying from a US$0.56/m^3 at RADEEM to US$1.44/m^3 at RADEEJ, averaging US$0.96/m^3.

Sewerage cost analysis

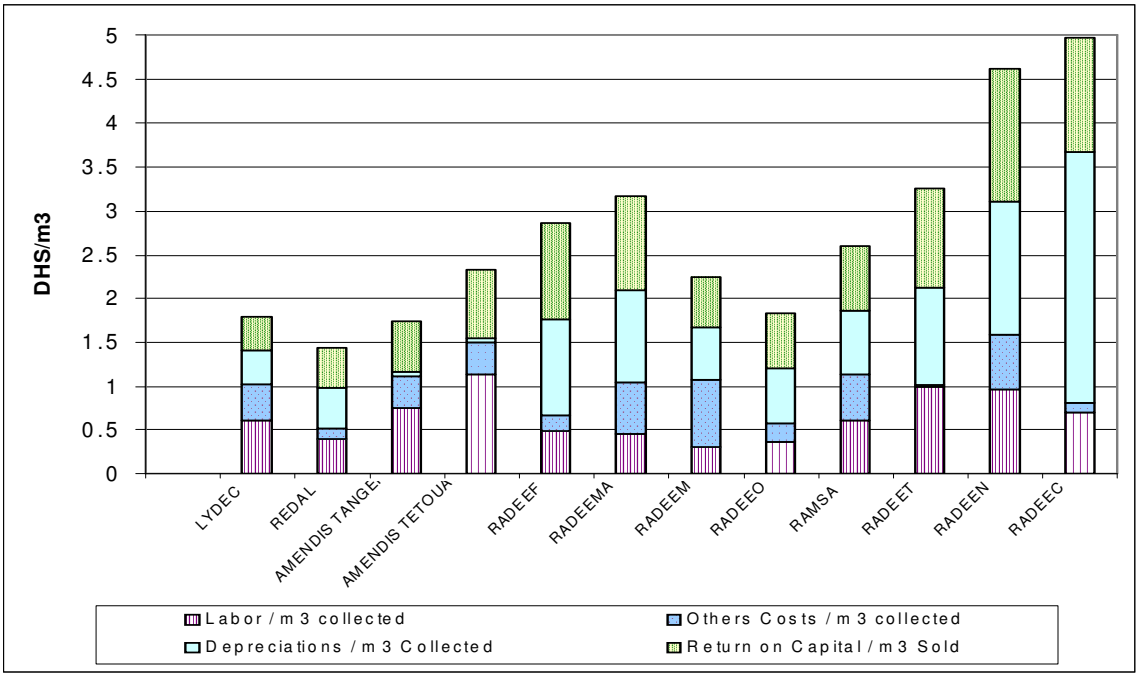
194. Similar data processing allows to estimate sanitation costs components for 9 operators as shown in Figure 25. Across the sample, depreciation levels are unusually low (averaging at 12.5 percent of operating charges) whereas a capital intensive activity such as sanitation typically sees depreciation levels in the 20-30 percent range. While analysis assumptions and data need further verification, this indicative trend suggests that the sanitation sub-sector may be sacrificing its assets through inadequate maintenance and limited investment capacity. A more accurate assessment would require more transparent and homogeneous asset valuation methods on the part of operators.

Figure 25: Main water service cost components for Moroccan operators in 2002



Source : DRSC - processed by World Bank

Figure 26: Main sanitation cost components for Moroccan operators in 2002



Source : DRSC - processed by World Bank

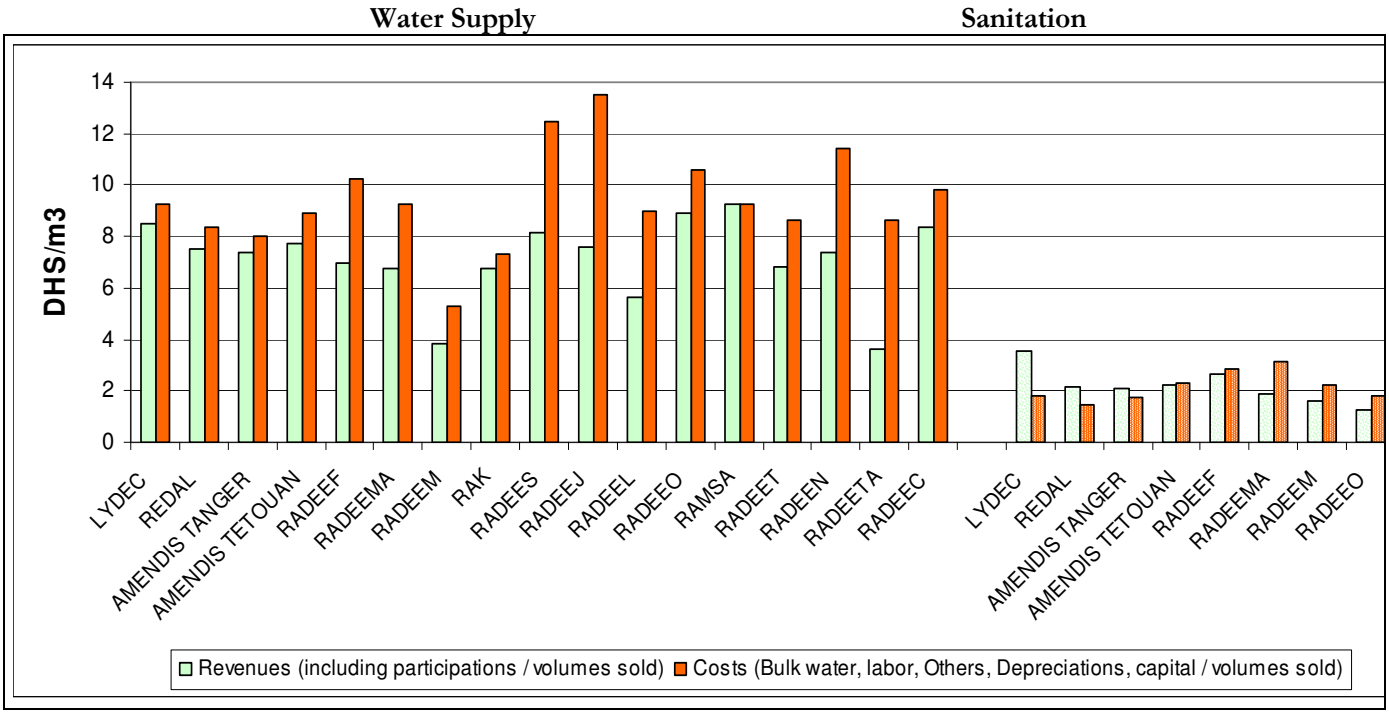
Assessment of cost-recovery through tariffs

195. A rough comparison of revenues and costs, per m3 of water supplied or wastewater collected, is offered in Figure 27, for the concessions and *Régies*. Costs were assessed as seen above, including operating charges, depreciation and financial costs. Revenue information was only available in aggregate of sales, connection fees and reimbursable works relevant to either

water or sanitation. The result of this approximate revenue vs. cost exercise is that all operations, with a few exceptions in sanitation, seem to be falling significantly short of cost recovery[47].

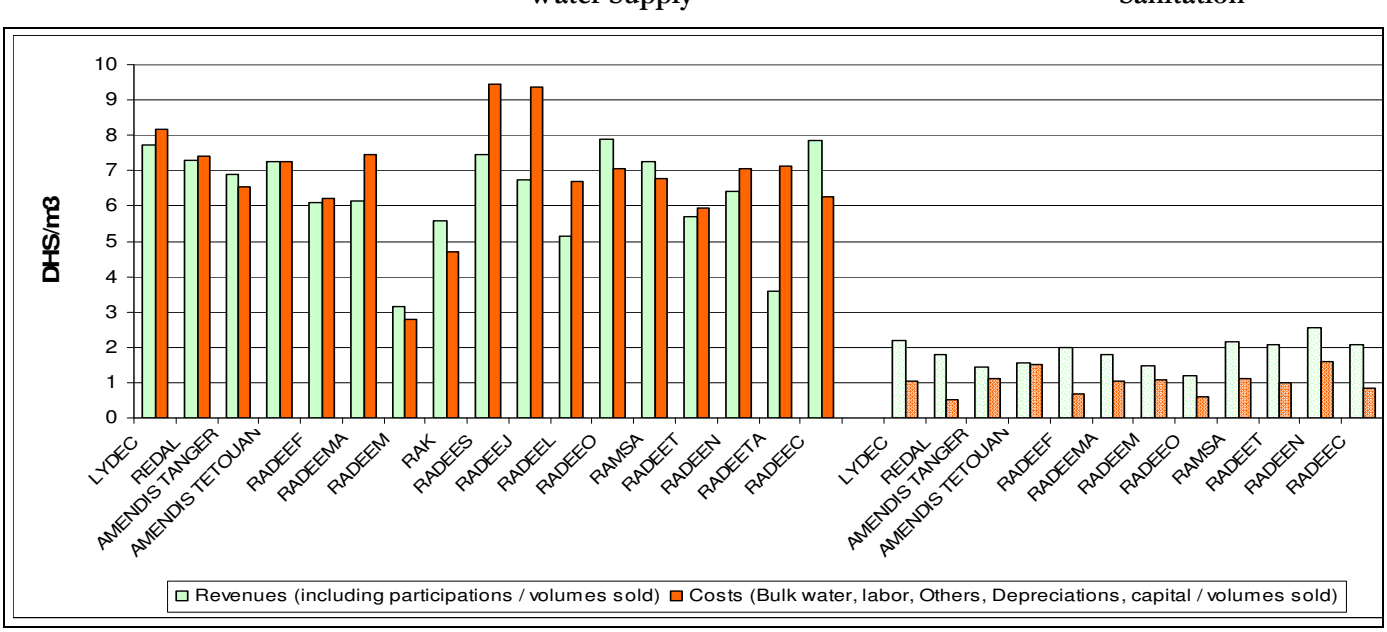
196. A variant "revenue vs. cost" comparison, limited this time to strictly operational expenses and revenues, without depreciation or financial costs, and without accounting for connection fee revenues, results in a slightly better viability outlook. Figure 27 summarizes such findings in which sanitation charges result widely recovered, whereas water supply charges are unevenly recovered (95 percent recovery).

Figure 27: Unit Revenues vs. Unit Costs (MAD/m3)



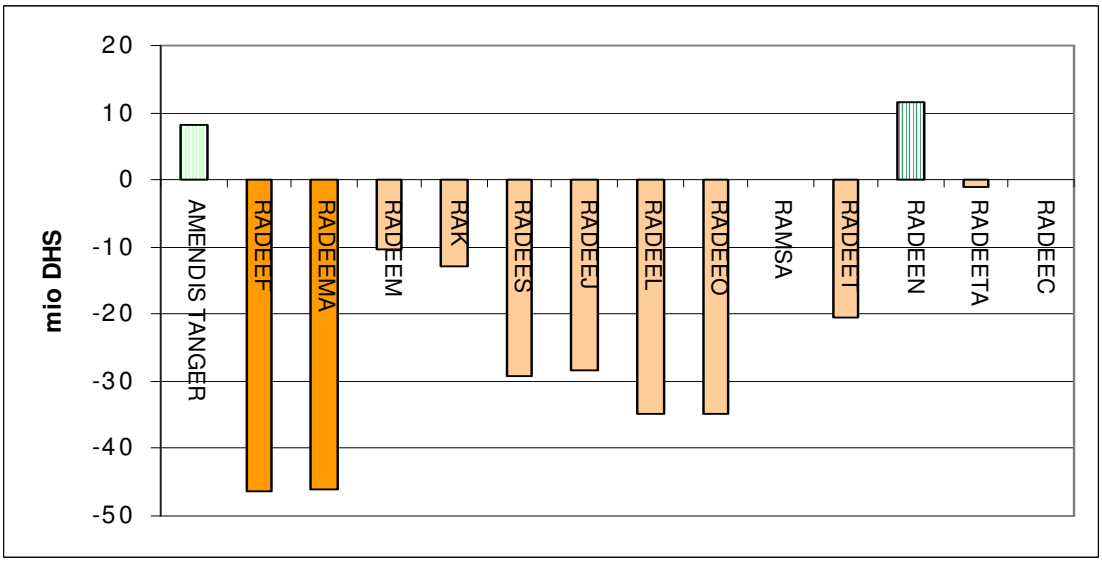
[47] And the cases of cost-recovery in sanitation may simply derive form under-depreciation.

Figure 28: Unit Operating Revenues vs. Unit Operating Costs (MAD/m3)



197. Actual FY2002 net operating results available for water and sanitation activities on a sample of 14 operators are displayed in Figure 29. They confirm the trends identified in Figure 27, and Figure 28, i.e. that a majority of water and sanitation *Régies* are running a deficit.

Figure 29: Net Operating Results (Water), FY2002 (MAD million)



Source : DRSC 2002

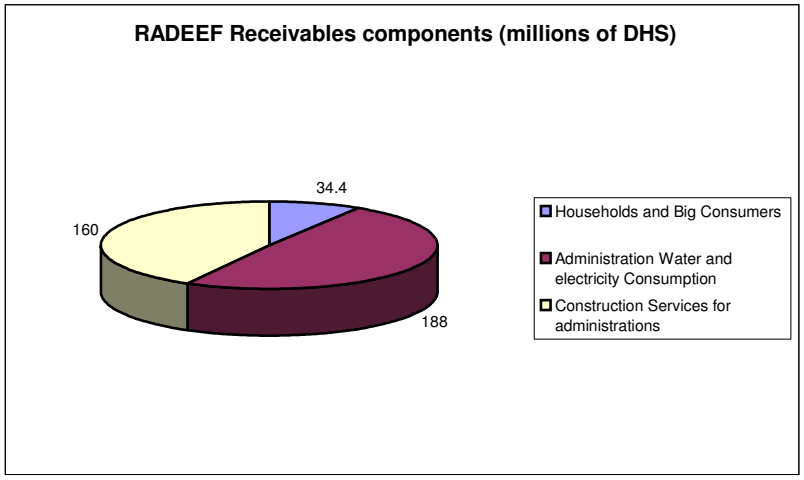
198. In light of these trends, it should be noted that a further gap exists between theoretical revenues and actual cash flow, due to uncollected billings accrual. Narrowing the gap between

theoretical revenues and actual cash-flows must be a priority for all sector operators. For obvious incentive reasons, private concessionaires have until now been the most successful on this front.

199. All customer categories contribute to the accrued account receivables, but the bulk is owed by Government agencies and institutional customers. Collection of overdue bills is relatively easy with individual consumers and large industrial users. Overdue accounts with governmental and administrative entities are the most resilient. Overdue payments include accrued consumption bills as well as unpaid contributions to connection or construction costs. As shown in (Fes) accounted for MAD 382 million in accrued receivables, of which MAD 348 million pending with various administrations. A consequence of this situation is that *Régies* have high working capital requirements, at about 2.5 months of revenues. The advance payment method imposed by ONEP (« vignettes ») for bulk water supply also heavily stresses the *Régies* working capital.

Figure 30: Overdue receivables at RADEEF, 2002

(Water, Sanitation & Electricity)



Source: RADEEF audited figures – 2002, Water,

For most *Régies* and all concessions, electricity distribution costs and revenues must also be factored in to assess the overall viability.

APPENDIX 2: PERFORMANCE INDICATORS FOR WATER AND SANITATION

Water and Sanitation at a Glance : Morocco

"Readily Available" Performance indicators	
ACCESS	
Access to improved water Sources (percent of population)	79.5 percent
Rural	56%
Urban	98%
Urban Access to improved Sanitation (% of Population)	95.1%
Sewerage (% of population)	80.4%
On-site sanitation (% of population)	14.7%
Rural Access to Imprived sanitation	29.4%
AFFORDABILITY *(Based on government agency study)*	
Water Average Tariff (US$/m3)	0.63[48]
Spending On Water Services (% Household Expenditure)	2.3%
Rural	2.9 %
Urban	1.8%
QUALITY	
Commercial Perception of Water Service (Index based on quality perception)	Check in the GCR (2002)
Water Supply Time (hours/day)	
Rural	N/a
Urban	24hours/day
Time spent in water collection (time to water source) for unconnected household	17.2 Minute
Rural	17.5 Minute
Urban	16.3 Minute
TECHNICAL DIMENSIONS	
Non-revenue Water (%)	Weighted average : 33.4% Range :20.4% and 47.2 %[49]
Non-Readily Available Performance indicators	
AFFORDABILITY	
Average Connection Charge for Water	between $ 220 and $ 550
Average Connection Charge for Sewerage	between $ 880 and $ 1,650
Average Construction Cost for on-site Sanitation Facilities	
Theoretical Expenditure On Subsistence Level (% Household Income)	2.7%[50]
QUALITY	
Urban Water Effectively Disinfected (% Water Production)	100%[51]
Urban Water Wastewater Treated to at least primary level (% Wastewater)	7%[52]

[48] Based on 2002 data from urban operators, including urban areas operated by ONEP.
[49] Non-revenue water only cities operated by ONEP, concessions and *Régies Autonomes.*
[50] Source: National Household Standard of Living Survey, 1998-99. Percent of water supply expenditure over total expenditures, for lowest income household category (C1).
[51] Assumes that self-production by Concessions and *Régies*, essentially through wells, is systematically disinfected.
[52]European Union (2003) Water Sector in Morocco, Report by the Water Thematic Group.

TECHNICAL DIMENSIONS	
Rural Water Supplies that are Functioning (% total supplies)	Estimated at 80%[4]
Employees/1000 Connections	3[53]
EFFICIENCY	
Technical Efficiency Index	
FISCAL COST	
Total National Expense on Water & Sanitation	
Operating Subsidies	
Rural	
Urban	
Capital Investment	
Rural	
Urban	
FINANCIAL AUTONOMY	
Working ratio (Operating Costs/Operating Revenues)	132 %[54] 100 %[55]
INSTITUTIONAL DEVELOPMENT	
Existence of Policy requiring Tariff to Cover O&M Costs (Y/N)	No
Rural	Yes
Urban	No
Urban Water Sector Policy Index	

(*) "Readily Available" refers to the partial availability of data for indicators through internationally known sources of data or existent data gathering instruments (e.g households surveys)

[53] Ratio calculated for operators in medium size and large cities (without ONEP).
[54] Based on 2002 income statements from *Régies Autonomes*, Concessions and ONEP' urban distribution service.
[55] Including revenues from construction and engineering services.

APPENDIX 3. SELECTED MOROCCO MACROECONOMIC INDICATORS

Table 1. Selected Macroeconomic Indicators

	1999	2000	2001	2002	Est. 2003	Est. 2004
GDP and unemployment rate:						
GDP (in million US$, Average rate)	35,249	33,335	33,901	36,094	44,489	47,117
Unemployment rate	13.9	13.6	12.5	11.6	11.9	12.3
Urban Unemployment rate	22.0	21.5	19.5	18.3	19.5	19.0
Real sector	(Annual percentage change)					
Real GDP	-0.1	1.0	6.3	3.2	5.5	3.0
Real agriculture GDP	-16.7	-15.7	27.6	5.6	20.6	-3.5
Real non-agriculture GDP	3.2	3.6	3.6	2.8	3.0	4.2
	(In percent of GDP)					
Agriculture	13.7	11.4	13.7	14.0	16.0	15.0
Industry	30.3	30.8	30.4	30.3	29.6	30.1
Services	56.1	57.8	55.9	55.7	54.3	54.9
Prices and exchange rate	(Annual percentage change)					
CPI inflation	0.7	1.9	0.6	2.8	1.1	2.0
Exchange rate, average, (Moroccan dirhams/US$)	9.80	10.63	11.30	11.02	9.57	9.50
Investment & saving	(In percent of GDP)					
Total investment	23.1	23.7	22.9	22.7	23.2	23.7
Gross national savings	22.6	22.3	27.6	26.8	26.1	26.4
Central Government	0.8	0.3	-1.1	0.1	-0.9	-0.2
Private and other Public sectors	21.9	22.0	28.7	26.7	27.0	26.6
Government finance	(In percent of GDP)					
Revenue (excl. privatization receipts)	26.9	26.2	24.9	24.7	24.1	24.0
Total expenditure and net lending	30.8	32.0	33.8	29.1	30.5	29.9
Current	26.2	25.9	26.0	24.6	24.9	24.3
Capital	4.9	5.4	5.7	5.0	4.7	4.5
Others (Hassan II Fund and Special accounts)	-0.3	0.7	2.1	-0.5	0.8	1.1
Overall balance (deficit(-))	-3.9	-5.8	-8.9	-4.4	-6.4	-6.0
Excluding Hassan II Fund	-3.8	-5.3	-6.2	-4.3	-5.1	-4.9
External sector	(In millions of U.S. dollars)					
Exports of goods and services	10,624	10,453	11,166	12,199	13,923	14,621
Imports of goods and services	11,959	12,538	12,282	13,314	15,944	16,633
Gross reserves	6,397	5,641	9,235	11,245	15,126	16,663
Gross reserves (months of imports)	6.4	5.4	9.0	10.1	11.4	12.0
Current account balance (% of GDP)	-0.5	-1.4	4.7	4.1	2.9	2.6
Total External Debt	(In millions of U.S. dollars)					
Total Debt Stock	22,480	20,755	19,944	18,601	17,437	15,463
Medium & Long Term	20,464	19,195	18,275	16,913	15,699	13,663
Short term	2,016	1,560	1,669	1,688	1,738	1,800
Debt to GDP Ratio (%)	63.8	62.3	58.8	51.5	39.2	32.8
Debt Service Ratio (%)	8.9	8.1	7.5	10.2	7.4	6.9

Source: Moroccan Government and World Bank staff estimate, Morocco Economic Monitoring Spring 2004.

APPENDIX4. SELECTED SOCIAL INDICATORS IN MOROCCO

Table 25: Selected Social Indicators in Morocco

	1990-1994			1997-2001		
	Morocco	**Urban**	**Rural**	**Morocco**	**Urban**	**Rural**
Population						
Population (millions)	**24.2**	**11.7**	**12.5**	**27.8**	**14.8**	**13.0**
Urbanization	**48.4**	**–**	**–**	**53.2**	**–**	**–**
Distribution of the population by age group						
Less than 15 years (%)	**39.8**			**33.8**	**29.5**	**38.9**
15 to 59 years (%)	**53.5**			**59.0**	**63.6**	**53.6**
More than 60 years (%)	**6.7**			**7.2**	**6.9**	**7.5**
Average household size	**5.9**[a]	**5.3**[a]	**6.6**[a]	**5.6**	**5.0**	**6.6**
Dependency ratio				**69.4**		
Fertility rate				**3.1**	**2.3**	**4.1**
Education						
Literacy rate (10 years or more, %)				**53.1**		
Health						
Life expectancy at birth				**68.8**	**72.2**	**65.9**
Maternal mortality	**359.0**			**228.0**		
Housing						
Population living in shacks (%)		**10.9**	**71.6**		**10.4**	**71.4**
Population with piped potable water (%)		**76.0**	**6.3**		**90.9**	**12.0**
Population with electricity (%)		**90.4**	**12.7**		**85.8**	**15.9**
Population with garbage pickup (%)		**84.8**	**2.0**		**85.1**	**2.4**
Labor Market						
Active population (%)				**18.5**		
Occupation by sector of activity						
Agriculture (%)					**4.9**	
Industrie (%)					**25.7**	
Construction (%)					**8.2**	
Services (%)					**60.4**	
Other (%)					**0.8**	

Source: World Bank 2004 - Millennium Development Goals in Morocco: Identifying Constraints and Opportunities.

APPENDIX 5. MILLENNIUM DEVELOPMENT GOALS AND WATER SUPPLY AND SANITATION: DEFINITIONS, COMMENTS AND LIMITATIONS ON DATA SOURCES

Millennium Development Goal 7: Ensure environmental sustainability. Target 10. Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

Data sources

The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), through the Joint Monitoring Programme, annually compile international data and assess trends in "access to improved drinking water sources" by drawing a regression line through the available household survey and census data for each country (details are available at http://www.childinfo.org). Regional and global estimates are aggregated from these national estimates using population-weighted averages.

Definitions

Since access and volume of drinking water are difficult to measure, the sources of drinking water that are thought to provide safe water are used as a proxy. Access to safe water thus refers to the percentage of the population with reasonable access in their dwelling or within a convenient distance of their dwelling to an improved water source such as piped water, public tap, borehole or pump, protected well, protected spring or rainwater. Improved water sources do not include vendor-provided waters, bottled water, tanker trucks or unprotected wells and springs. The *Global Water Supply and Assessment Report 2000* defines *reasonable access* as "the availability of 20 liters per capita per day at a distance no longer than 1,000 meters".

Access to safe sanitation refers to the percentage of the population with access to improved sanitation facilities. Improved sanitation facilities include adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta. Adequate excreta disposal include all the range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, these facilities require good construction and proper maintenance.

Comments and Limitations

Two data sources are common: administrative or infrastructure data that report on new and existing facilities, and data from household surveys, including Multiple Indicator Cluster Surveys, Demographic and Health Surveys and Living Standard Measurement Surveys. Before these population-based data were available, only provider-based data were used. Administrative data are often available annually. Household surveys are generally conducted every three to five years.

Evidence suggests that data from surveys are more reliable than administrative records and provide information on facilities actually used by the population. When data from administrative sources are used, they generally refer to existing sources, whether used or not. Despite official WHO definitions, the judgment about whether a water source is safe is often subjective. Also, the existence of a water supply does not necessarily mean that it is safe or that local people use it.

While access is the most reasonable indicator for water supply, it still involves severe methodological and practical problems. Among them:

- The data are not routinely collected by "the sector" but by others outside the sector as part of more general surveys.
- Water quality is not systematically addressed.
- The timing of collection and analysis of household survey data is irregular, with long intervals between surveys.

APPENDIX 6. ENQUETE NATIONALE SUR LES NIVEAUX DE VIE DES MENAGES 1998/99

From:

ROYAUME DU MAROC
PREMIER MINISTRE
MINISTERE DE LA PREVISION ECONOMIQUE ET DU PLAN

PREMIERS RESULTATS
DIRECTION DE LA STATISTIQUE

Tableau H 03 : Ménages selon les conditions d'habitation et la classe de la dépense annuelle moyenne par

Indicateurs	Classe de la dépense annuelle moyenne par personne					Total
	1	2	3	4	5	
Ménages (en %) selon le mode d'évacuation des eaux usées						
Egouts	13,4	28,7	40,4	53,5	75,0	46,3
Fosse septique	3,3	3,9	5,0	5,0	2,9	4,0
Fosse d'aisance ou lactrine	13,2	15,7	19,5	18,4	12,0	15,6
Jetées dans la nature	67,9	50,5	34,1	22,2	9,7	33,0
Autre	0,3	0,1	0,5	0,5	0,1	0,3
Non déclaré	1,9	1,1	0,5	0,4	0,3	0,8
Total	100,0	100,0	100,0	100,0	100,0	100,0

personne (suite)

Tableau H 04 : Ménages selon l'approvisionnement en eau potable et le milieu de résidence

Indicateurs	Milieu de résidence				
	Grandes Villes	Moyennes et petites villes	Urbain	Rural	Ensemble
Ménages (en %) selon l'origine de l'eau utilisée pour la boisson					
• Banchements individuels	81,3	72,7	78,4	5,3	47,1
Compteur à usage exclusif	52,6	55,7	53,6	4,8	33,0
Compteur à usage partagé	28,7	17,0	24,8	0,5	14,1
• Bornes fontaines	14,1	9,7	12,5	6,6	10,0
Payantes	1,2	0,3	0,9	3,3	1,9
Gratuites	12,9	9,4	11,6	3,3	8,1
• Sources naturelles	1,2	10,6	4,5	81,9	37,6
Puits d'eau collectif aménagé	0,0	1,1	0,4	3,8	1,8
Métfia collective	-	-	-	1,8	0,8
Puits collectif non aménagé	0,4	1,9	0,9	22,8	10,3
Sources	-	0,7	0,3	20,2	8,8
Oued	-	-	-	3,9	1,7
Seguia	0,4	0,5	0,4	2,2	1,2
Puits privé	0,4	6,3	2,4	19,5	9,7
Métfia privé	0,0	0,1	0,1	7,7	3,3
• Autres sources	1,7	2,7	2,0	1,7	1,9
Vendeur d'eau	0,9	1,2	1,0	0,6	0,8
Camion citerne	0,8	1,5	1,0	1,1	1,1
• Sources non classées par ailleurs	1,5	4,0	2,4	3,5	2,9
• Non déclaré	0,1	0,3	0,2	1,0	0,5
Total	100,0	100,0	100,0	100,0	100,0
Ménages non branchés (en %) au réseau selon le traitement de l'eau utilisée par la boisson					
Eau de javel	11,7	44,8	26,0	32,2	30,8
Ebullition	0,8	2,3	1,5	0,6	0,8
Avec comprimé	2,4	4,5	3,3	5,7	5,2
Eau de chaux	-	1,0	0,5	1,4	1,1
Un autre procédé	25,1	8,7	17,9	2,1	5,9
Non traitée	58,2	37,2	49,1	56,9	56,2
Non déclaré	1,8	1,5	1,7	1,1	-
Total	100,0	100,0	100,0	100,0	100,0

Tableau H 04 : Ménages selon l'approvisionnement en eau potable et le milieu de résidence (suite)

Indicateurs	Milieu de résidence				
	Grandes Villes	**Moyennes et petites villes**	**Urbain**	**Rural**	**Ensemble**
Ménages (en %) non branchés selon la raison du non raccordement au réseau d'eau potable					
Trop cher	26,5	34,2	29,8	2,9	9,3
Pas nécessaire	1,7	2,7	2,2	0,9	1,2
Pas de réseau dans la zone (douar) de résidence	33,2	47,8	39,5	94,6	82,0
Autre	37,9	14,1	27,6	1,4	7,5
Non déclaré	0,7	1,2	0,9	0,2	-
Total	100,0	100,0	100,0	100,0	100,0
Ménages (en %) non branchés au réseau selon la corvée des transports d'eau					
Tous les membres du ménage	40,2	39,8	40,1	40,8	40,6
Chef du ménage	11,7	15,0	13,1	13,1	13,1
Epouses ou (époux) du chef du ménage	20,0	17,7	19,0	20,3	20,0
Garçon et fille (moins de 15 ans)	8,2	5,8	7,1	10,2	9,5
Adultes masculins	2,5	3,4	2,9	4,6	4,2
Adultes féminins	5,9	5,6	5,8	6,5	6,3
Autres personnes	11,5	12,7	12,0	4,5	6,3
Total	100,0	100,0	100,0	100,0	100,0
Ménages (en %) non branchés selon la distance parcourue pour s'approvisionner en eau potable					
Moins de 200 m	64,2	65,1	64,6	38,6	44,7
De 200 m à moins 500 m	21,8	18,2	20,3	17,3	18,0
De 500 m à moins d'un/Km	11,6	6,8	9,5	15,8	14,3
De 1 à moins de 3 Km	1,4	7,2	3,9	19,3	15,7
De 3 à moins de 5 Km	0,3	0,6	0,6	5,4	4,3
De 5 Km et plus	-	0,5	0,2	3,5	2,7
Non déclaré	0,7	1,2	0,9	0,1	0,3
Total	100,0	100,0	100,0	100,0	100,0
Distance moyenne (en m)	198	306	245	821	688
Ménage non branchés (en %) selon le temps mis pour s'approvisionner en eau potable (en %)					
Moins de 15 mn	88,0	81,8	85,3	60,7	66,4
15 à moins 30 mn	8,8	7,6	8,3	18,3	16,0
30 à moins 60 mn	1,9	7,6	4,4	12,8	10,8
60 mn et plus	0,6	1,8	1,1	8,1	6,5
Non déclaré	0,7	1,2	0,9	0,1	0,3
Total	100,0	100,0	100,0	100,0	100,0
Temps moyen (en mn)	13,6	19,7	16,3	17,5	17,2

Table : Tableu H 05 : Population (en %) selon les sources d'approvisionnement en eau potable et le milieu de résidence

Indicateurs	Milieu de residence				
	Grandes villes	Moyennes et petites villes	Urbain	Rural	Ensemble
• Branchements individuels	80,9	72,5	78,0	5,5	44,6
Compteur à usage exclusif	55,4	57,5	56,1	5,1	32,6
Compteur à usage partagé	25,5	15,0	21,9	0,4	12,0
• Bornes fontaines	14,9	9,5	13,0	6,1	9,8
Payantes	1,5	0,3	1,0	3,3	2,1
Gratuites	13,4	9,2	12,0	2,8	7,7
• Sources naturelles	1,3	10,9	4,6	82,3	40,4
Point d'eau collectif aménagé	-	1,0	0,4	4,1	2,1
Métfia collective	-	-	-	1,5	0,7
Puits collectif non aménagé	0,5	2,2	1,1	22,7	11,0
Sources	-	0,4	0,1	19,4	9,0
Oued	-	-	-	4,2	1,9
Séguia	0,4	0,5	0,4	1,8	1,1
Puits privé	0,4	6,7	2,6	21,6	11,3
Métfia privé	-	0,1	-	7,0	3,3
• Autres sources	2,9	7,1	4,4	6,1	5,2
Vendeur d'eau	0,8	1,1	0,9	0,5	0,7
Camion citerne	0,6	1,7	1,0	1,2	1,1
Sources non classées par ailleurs	1,4	4,0	2,3	3,3	2,8
Non déclaré	0,1	0,3	0,2	1,1	0,6
Total	100,0	100,0	100,0	100,0	100,0

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IBRD 33569

MOROCCO

WATER DISTRIBUTION REGIES AND CONCESSIONS

AMENDIS CONCESSIONS

RADEEMA REGIES

HEADQUARTERS OF REGIES

PROVINCE CENTERS SERVED BY REGIES

Mediterranean Sea

ATLANTIC OCEAN

Tanger
AMENDIS
TANGER
Asilaho
El Khab
AMENDIS
Tetouan
TETOUAN
Melilla
400
Nador
RADEEN
Larache
RADEEL
LARACHE
Lao
Ksar-el-Kebir
Chefchaouen
CHEFCHAOUEN
Al Hoceima
AL HOCEIMA
Nekor
NADOR
Rif
BERKANE
OUJDA ANGAD
RADEEO
Oujda
400
Jerada
El Hai
JERADA
KENITRA
Sebou
TAOUNATE
Taounate
SIDI KACEM
Sidi Kacem
RAK
Kenitra
Taza
RADEETA
TAZA
Inaouene
Fes
RADEEF
FES
Moulay-Idriss
Meknes
RADEEM
Sefrou
KHEMISSET
Khemisset
Bou Regreg
Beht
MEKNES
Ifrane
Azrou
IFRANE
Sebou
Boulemane
BOULEMANE
Moulouya
TAOURIRT
250
REDAL
RABAT
Sale
Temara
RABAT
Skhirat
Mohammedia
BENI SLIMANE
Beni Slimane
Casablanca
LYDEC
CASABLANCA
Grou
Korifla
Akrellah
400
El-Jadida
RADEEJ
Azemmour
Berrechid
Settat
RADEEC
SETTAT
Oum er Rbia
KHOURIBGA
Khouribga
Boujad
Khenifra
KHENIFRA
Atlas
Middle
FIGUIG
Figuig
Oualidia
EL-JADIDA
Khemis Zemamra
Sidi Bennour
El Borouj
Kasba Tadla
Fkih Ben Salah
BENI-MELLAL
Beni-Mellal
RADEET
Abid
Safi
RADES
SAFI
Youssoufia
Sebt Gzoula
Chemaia
KELAAT SRAGHNA
Kelaat Sraghna
Azila
AZILAL
Errachidia
ERRACHIDIA
Ziz
Lakhdar
Tamanar
250
Tensift
MARRAKECH
Marrakech
RADEEMA
Tahannaout
Tessaout
Atlas
High
Essaouira
ESSAOUIRA
Chichaoua
CHICHAOUA
AL HAOUZ
Dades
OUARZAZATE
Ouarzazate
Rheris
0 50 100 150
KILOMETERS
RAMSA
Agadir
Inezgane
Ait Melloul
AGADIR
Taroudannt
Souss
TAROUDANNT
Anti Atlas
Draa
ZAGORA
APPROXIMATE BOUNDARY
Tizni
TIZNIT
Tata
TATA
Guelmime
GUELMIME
Tan-tan
TAN-TAN
ASSA - ZAG
Draa

32°
28°
8°
4°

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MOUNTAINS

400 ISOHYETS

RIVERS AND WADIS

PROVINCE CAPITALS

NATIONAL CAPITAL

PROVINCE BOUNDARIES

INTERNATIONAL BOUNDARIES

INTERNATIONAL BOUNDARIES (APPROXIMATE)

SEPTEMBER 2004