WATER, SANITATION AND SUSTAINABLE DEVELOPMENT

The challenge of cities in developing countries

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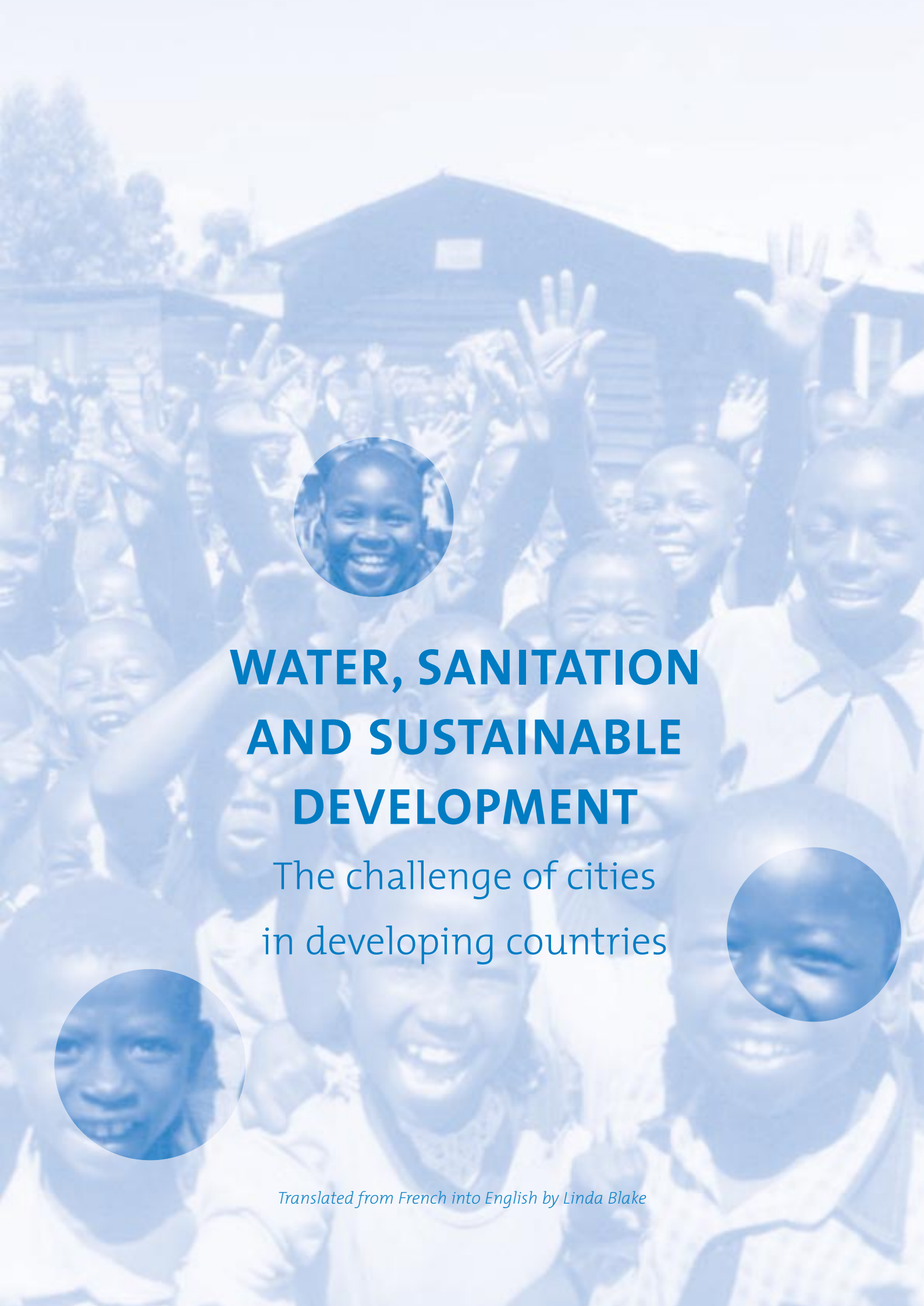

WATER, SANITATION AND SUSTAINABLE DEVELOPMENT

The challenge of cities in developing countries

Translated from French into English by Linda Blake

This shared publication project is the initiative of Veolia Water's Waterdev Programme

"A society without a dream is a society without a future"

Carl Gustav Jung (1875-1961)

"A dream that is dreamt by just one person is only a dream. If it is dreamt by several persons it can become reality."

African proverb

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PROLOGUE

The management of water is being revolutionized. A body of knowledge involving a wide variety of disciplines is currently being organized in which technical, economic, financial, social and cultural considerations all come into play: we are witnessing the birth of a new science.

The foremost vocation of this new science concerns human ecology. The goal is to better understand interactions between humans and their environment in order to improve both the well-being of mankind and the way the Earth's natural resources are used and managed. The pronounced social repercussions of this goal is the source of increasingly lively controversy at both a local level (local authorities and the communities they represent) and an international level (governments and major public, private, and non-governmental organizations).

Cities are growing everywhere in the world and are being confronted with new problems. Increased co-operation among public and private players, associative bodies and consumers is needed to meet the demand for services that are suited to the needs and real situation of users.

- **Cities are growing and facing new problems**

The water and sanitation sector is presently facing widespread urban growth throughout Asia, Africa and Latin America. Because of this expansion, often hard to control, cities are changing very quickly and public services sometimes have a hard time keeping up. When it happens too fast, urban growth can result in a crisis situation that in turn causes a water crisis: public supply networks in peripheral areas and in precarious settlements accommodating the most disadvantaged populations are practically inexistent, as are suitable sanitation systems. Such crises have very serious consequences: increased public health hazards, over-exploitation of groundwater, the pollution of resources.

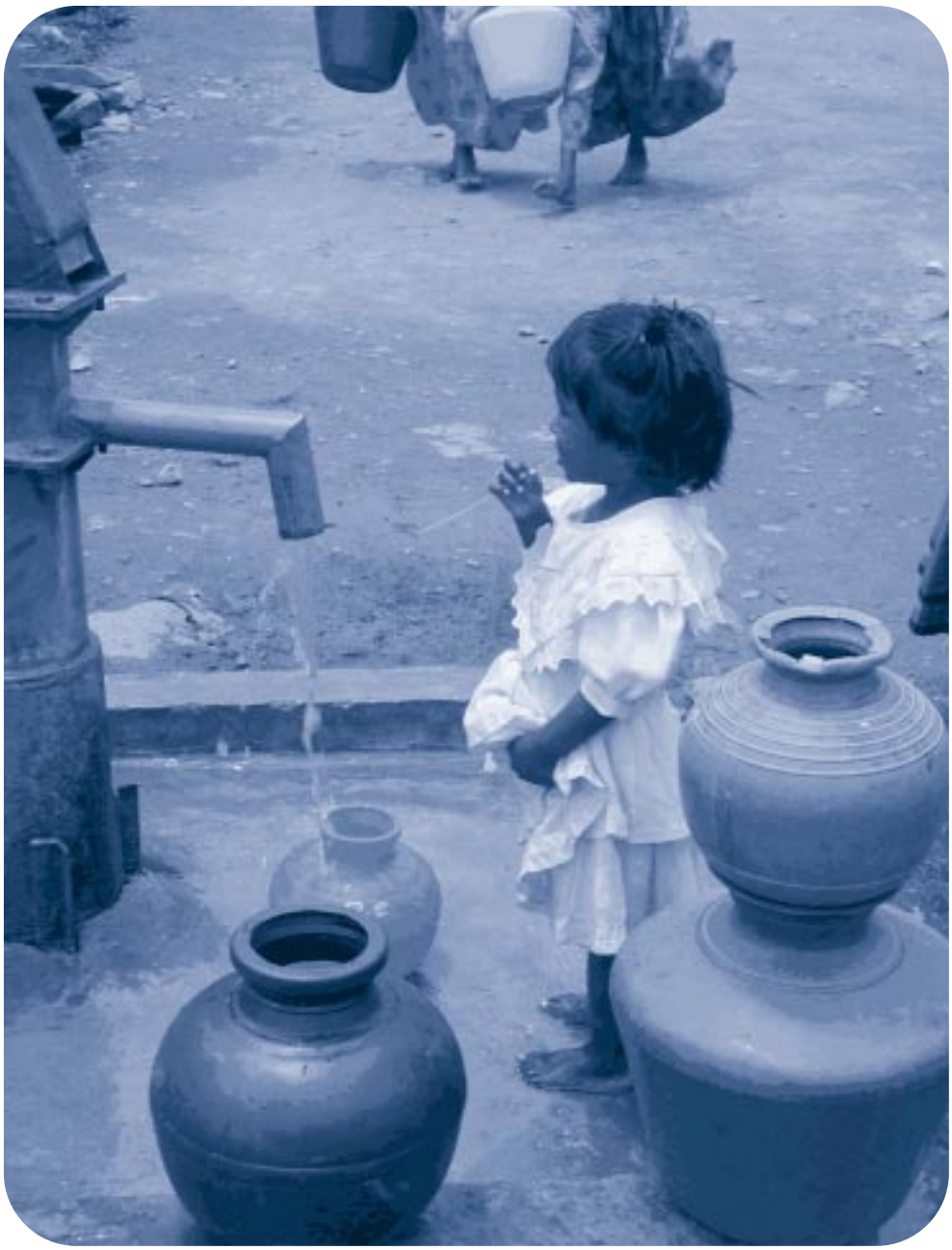
- **Increased co-operation among public, private and associative bodies and consumers has become essential**

The burden of finding solutions for water supply and sanitation has been increasingly relegated to local authorities within the scope of decentralization policies; unfortunately these entities do not always possess the means to assume these responsibilities. Major operators working within the framework of delegated management, and also small businesses, usually in the informal sector and active in marginalized areas, are now working side-by-side with local authorities to come up with, each at their own level, solutions to water supply and sanitation problems. New players have also entered the scene, such as local, regional, national and international non-governmental organizations (NGOs); their job is to back targeted actions around the world. All the players in the water sector must account for the most disadvantaged populations in their actions.

- **Consumers are demanding services better suited to their needs and real situation**

With the help of associations, management committees and/or NGOs, urban communities are getting organized and becoming structured to better voice their expectations, and even their demands. Represented by groups or by individual leaders, communities are defending their interests and demanding to be heard in order to account for their specific socio-economic situation. Information campaigns, training and, on a broader scale, community participation are becoming increasingly necessary to effectively organize sustainable water supply and sanitation services that are welcomed by consumer communities.

The insufficiencies of essential services disrupt the local economic dynamic insofar as they have a direct effect on other key development factors, and primarily on living conditions and job stability. **The improvements expected from the co-ordinated organization and management of water supply and sanitation services represent an opportunity for establishing a sound basis for sustainable development in developing countries.**



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UNESCO

Subsequent to the 3rd World Water Forum held in Kyoto in March 2003, the United Nations officially included the right to water among the essential rights of humankind. Water concerns all aspects of our existence: health, wellbeing, human rights, the environment, the economy, politics and culture. No country or any sector of activity can confront today's water crisis alone, a crisis of such amplitude as never before seen in human history. The current situation demands solutions that are adapted to local cultures and environments. Their implementation demands a major international co-operation effort that is scientific and political, but also requires the participation of all the sectors and players involved in the world of water. Scientific knowledge and technical know-how are not enough to remedy the present and alarming situation. Only by establishing dialogue among all water-related fields and civil society can a solution be found.

One of the essential tasks of UNESCO is to promote the effective governance of water based on best practices and on the respect of ethical principles throughout the world. The effective governance of water can only be achieved if communication among all parties concerned by water resource management takes place in an atmosphere of transparency.

The first step in improving the governance of water is to gain the trust of consumers who pay for water supply and sanitation services, and this trust depends on transparency in financing and managing these services at the local level within the national institutional context. This is not always an easy task, especially when water is not perceived as a priority. The training of executives whose preoccupations are not directly connected to local needs has now become equally necessary, as has the participation of consumers, from developing technical solutions through the decision-making process.

In light of the United Nations' *Millennium Declaration* and the priorities established during the Johannesburg Summit, the third World Water Forum stressed the importance of dialogue and interaction between public and private sectors. **This publication, prepared in collaboration with Veolia Water and the programme Solidarité-Eau, reveals the utility of such dialogue and interaction, and how such interchanges may become the most effective way to define the rights and responsibilities of all the players involved in the water sector, including national and international institutions, research centres, the private sector, communities, NGOs, etc., all of whom, by making water and sanitation more accessible to populations, contribute to their sustainable development.**

Andras Szöllösi-Nagy,
Secretary of the International Hydrological Programme and
Deputy Assistant Executive Director of Natural Sciences, UNESCO

Veolia Water

The 2nd World Summit for Sustainable Development was held in Johannesburg, South Africa in August, 2002. Ten years after the Earth Summit on the Environment held in Rio de Janeiro, environmental preoccupations have now clearly become essential values for constructing the world of tomorrow.

The international community attending the South African Summit came to a common accord to extend the objective set forth in the *Millennum Declaration*, i.e. to lower by half, the proportion of persons without access to potable water by 2015, adding access to sanitation by the same date, thus allowing as many human beings as possible to attain dignity and a safer life.

Such commitments are vital for securing sustainable development on a worldwide scale. However, they also imply that all the parties involved in the organization, management, development and financing of water supply and sanitation services have found their place and assumed their responsibilities within balanced partnerships devoted to providing service to consumers.

As a professional operator, Veolia Water works with many local authorities throughout Europe, Sub-Saharan and West Africa, North Africa, Latin America and Southeast Asia. Our goal is to share our technical know-how and capacity to innovate in a wide range of contexts with public authorities in order to best meet their needs, and in particular help them manage and modernize public-owned infrastructure to improve water supply and sanitation services for all.

The rapid growth of urban populations around the world, the central role played by essential services in fighting poverty and the need to promote *sustainable urbanization* necessitate innovative technical, financial but also socially-acceptable solutions.

Veolia Water's Waterdev Programme has been set up to contribute to and provide the means for thinking through and sharing experiences focused on the main challenges of access to water and sanitation in the cities of developing countries.

This publication, drafted following the 3rd World Water Forum held in Kyoto in March 2003, confirms our joint mobilization with programme Solidarité-Eau and UNESCO to find concrete solutions as quickly as possible to meet the two-fold commitment made at the Johannesburg Summit.

Antoine Frérot,
Chief Executive Officer of Veolia Water

programme Solidarité-Eau - Water Solidarity Programme

Despite the investment efforts made during the 'international decade for potable water and sanitation' (1980-1990), more than one billion persons still do not have access to safe drinking water, and nearly two and a half billion persons have no form of sanitation. In Johannesburg in 2002, during the Summit on Sustainable Development and more recently in Kyoto, during the 3rd World Water Forum, the representatives of States and governments of the entire planet proclaimed their determination to attain the development goals of the Millennium, i.e. to lower by more than half, the proportion of persons deprived of safe water and sanitation by 2015.

It was in this frame of mind that the French Presidency of the G8 held at Evian in June 2003 set the objective of giving priority to Africa and to sustainable development before announcing the doubling of French public aid for development in the field of water.

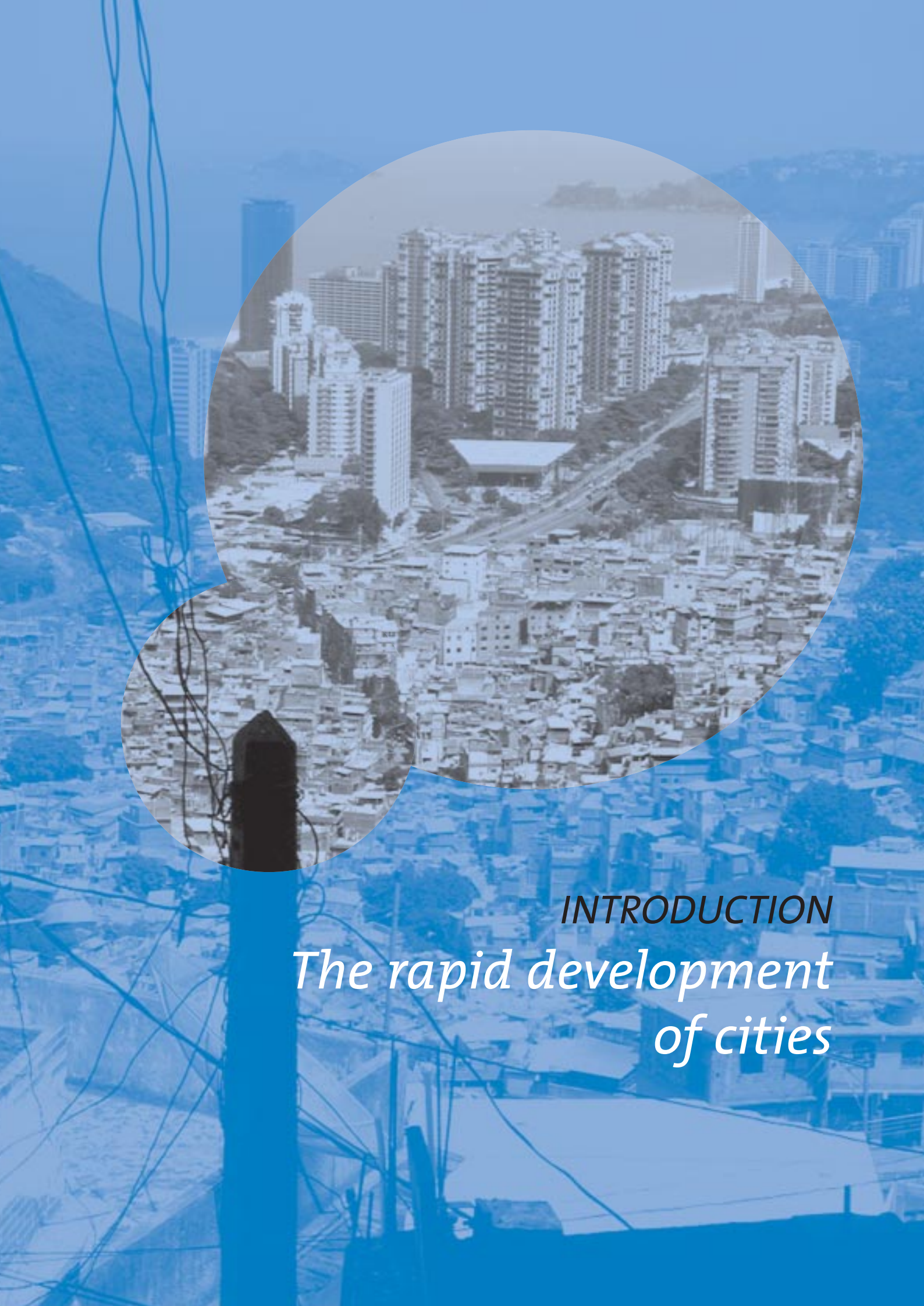
However formal they may be, these declarations of intent have not yet been followed through on. The funding needed to launch a programme targeting the Millennium objective within the deadline (2015) has been estimated at USD 100 billion – all sources combined – by the world panel headed by Michel Camdessus. Overcoming the financial hurdle and defining pertinent strategies are not technically impossible tasks. But rising to the challenge of water presupposes above all the resolute commitment of the international community and the joint mobilization of all capabilities, i.e. those of States, local authorities, private companies, associations, etc.

In the countries of the South where the majority of needs are concentrated, aid, however massive it may be, cannot be fruitful without the development of a social, technical and financial environment that promotes the sustainability of services. Providing effective and sustained access to potable water and sanitation without depriving consumers and their representatives of their decision-making powers and control demands both a sharper perception of the roles of all those involved and the strengthening of the respective capabilities of local players.

The ideal model for managing services doesn't exist. Selecting the most appropriate type of management can only be done on a case by case basis in relation to the context: the existence and dynamics of local authorities, the availability of the water resource, the type of dwelling, the complexity of the technical installations, the local economy, consumer demand, etc. But whatever the management arrangement selected, consumer representatives, and particularly elected community officials, must take a real part in service organization and operation and must consequently be trained in exercising their responsibilities, including, if required, negotiating public service delegation.

pS-Eau has been working in this direction for many years by linking together the capabilities and know-how of local authorities, associations, private enterprises and researchers to ensure the setting up of efficient and sustainable public services. We hope that the publication of this joint document will accelerate the implementation, on a major scale, of the concrete solutions it explores.

René Ala,
Ambassador of France,
President of pS-Eau



INTRODUCTION
The rapid development of cities

INTRODUCTION
The rapid development of cities

In the 19th century, the industrial revolution spurred the growth of cities across Europe and North America. Today the developing world is witnessing rural exodus without precedent. In 2005 and for the first time in history, more than half of humanity will be concentrated in cities, whereas city dwellers represented only 10% of the world population in 1900. In 2025, 60% of the Earth's inhabitants will live and work in an urban setting. The combined effect of demographic growth and rural exodus are causing new imbalances and tensions in the organization of public utility services.

0.1 The dynamics of urban expansion
0.2 Key factors determining access to basic services
0.3 Complex situations in the field
0.4 Mobilizing all the players

0.1 THE DYNAMICS OF URBAN EXPANSION

World population (6.314 billion persons in 2003) is growing 1.2% per annum, i.e. by 77 million persons each year. The urban population growth rate is 1.5% in Africa, 1% in Latin America and 2% in Asia. The global urban population increases every day by 180,000 persons (the equivalent of a new town of 5.5 million inhabitants every month).

GROWTH IN URBAN AND WORLD POPULATION
(in billions) - Source: 'World urbanization prospects: The 1994 revision', UN, 1995

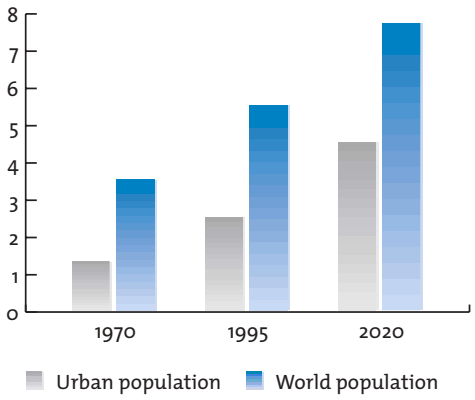


FIGURE 0.1

WORLD POPULATION GROWTH AND PROJECTIONS
Source: Jean-Noël Biraben, ined and UN

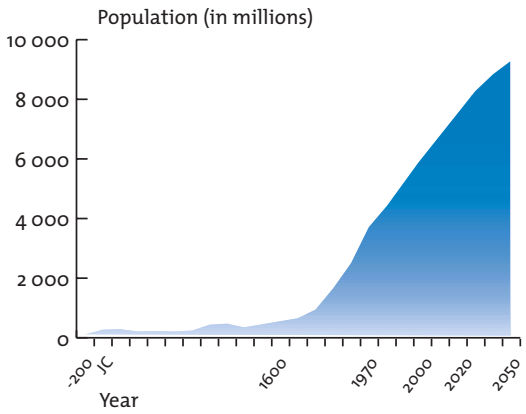


FIGURE 0.2

The cities of India accommodate around 600,000 new inhabitants each month. Completely overwhelmed, public infrastructure is often incapable of meeting the needs of populations. Nearly 95% of the growth in world urban population will be concentrated in developing countries until the year 2030 (i.e. approximately 2 billion persons). Africa and Asia, which today are the least urbanized continents on the planet, are also those whose potential for growth is the greatest.

URBAN POPULATION GROWTH IN ASIA AND AFRICA (PERIOD 2000-2025)

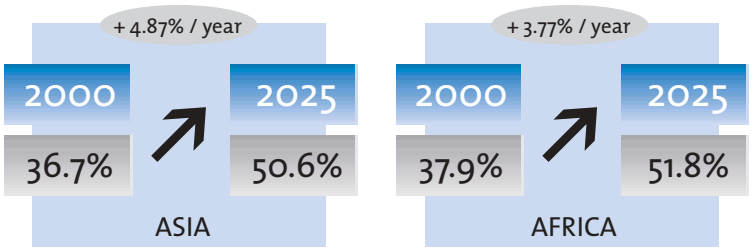


FIGURE 0.3

NUMBER OF CITIES WITH MORE THAN 500,000 INHABITANTS IN THE WORLD IN THE YEAR 2000
Source: United Nations

FIGURE 0.4

According to UN forecasts, 23 of the 27 cities with more than 10 million inhabitants will be located in the southern hemisphere in 2015. The multiplication of megacities is primarily occurring in developing countries, with Asia leading the way: of the 19 megalopolises with more than 10 million inhabitants in the year 2000, 11 were in Asia. China alone already counts 72 cities with more than one million inhabitants.

Among the world's most populated cities, Mumbai in India, ranked third in 2000 with 18 million inhabitants, will move to second place in 2015 when its population will exceed 26 million. Lagos in Nigeria, ranked 25th in 1985 with 5.8 million inhabitants, will move to third place in 2015 with 24.4 million inhabitants. **Urban centres with less than 5 million inhabitants will grow the fastest in the next 15 years: the number of cities with a population of between 1 and 5 million will grow by around 13%, and that of cities with between 0.5 and 1 million inhabitants by 25%.**

This sudden spurt in urban growth will be accompanied by profound imbalances. Developing cities will become poorly-developed cities. According to the United Nations Development Programme (UNDP), 1.3 billion persons currently live in a state of extreme poverty, with less than USD 1.00 per day to meet their needs.

URBAN POPULATION GROWTH FACTORS

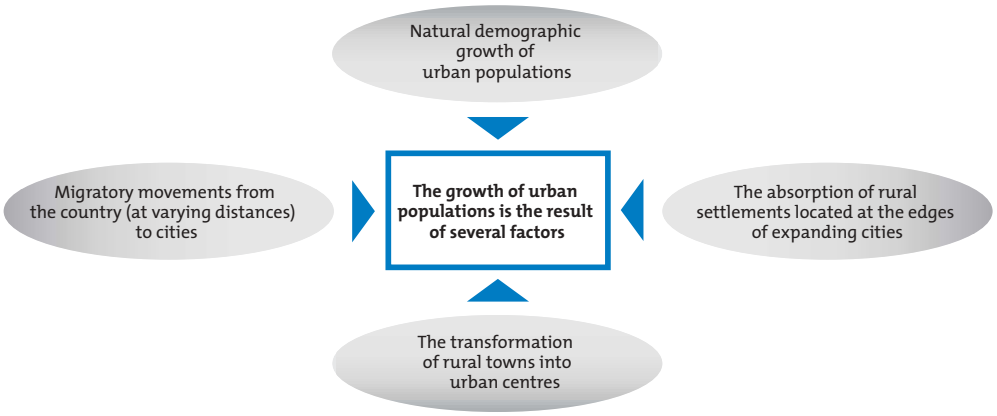


FIGURE 0.5

This urban expansion phenomenon is often accompanied by the multiplication and/or spread of disadvantaged settlements – *favelas* in Brazil, *townships* in South Africa and *slums* in India. Cities have become a mirage for country dwellers, whose arrival creates new social tensions calling for new forms of governance within the municipality. Newly arrived people sometimes settle in very precarious conditions around the city's periphery, on the edges of city refuse dumps, in huts they build with any materials they can find, in abandoned and dilapidated buildings (in central districts), or on low-lying, swampy ground.

0.2 KEY FACTORS DETERMINING ACCESS TO ESSENTIAL SERVICES

Half the 600 largest cities of China suffer from chronic water shortage. In addition to the obvious inconvenience for consumers and the impact on household organization, discontinuity in service has serious consequences on the quality of the water distributed, because cut-offs cause pressure drops that sometimes draw soiled and stagnant water into the poorly maintained piping. In many cities water distribution has become episodic.

> What are essential services?

Essential services are the vital or basic services required for a dignified and decent life:

- **Public drinking water supply and sanitation services**
- **Public hygiene and waste removal services**
- **Energy distribution services (electricity, gas)**
- **Educational and training services**

This list is sometimes extended to include other essential services such as daily public transport and basic information and communications services. To ensure the availability of these essential services, natural resources must be preserved: water, air, non-renewable or scarce resources (fossil fuels, natural materials), the natural heritage (biodiversity, primal forest). Access to essential services constitutes one of the bases for sustainable development and is an important component of environmental protection measures. These services contribute to the health, safety and well-being of humans.

Source: French Committee for the World Summit on Sustainable Development.
Figure 0.6

In Karachi (Pakistan), water is only distributed 4 hours per day, and in Kathmandu (Nepal), only 6 hours per day. This is also the case in many African cities. The traditional management of services is largely hindered by the urgency of lowering chronic drinking water shortages, and to provide sanitation (very rapid increase in demand, claims on the part of consumers who no longer tolerate disruptions in supply, etc.). Even when distribution networks have been laid, many shortages still occur due to the high level of line losses, which sometimes reach 60% of the volume of water supplied. And these losses only heighten the possibility of shortages.

Low income populations are often the first to be affected by water shortages and sanitary crises: due in a large part to lack of funding, public networks have not been laid quickly enough to reach outlying settlements, which are often difficult to access or are located far from the city centre. Poorly controlled urbanization makes it even harder and more complex for operators to supply populations whose dwellings are precarious and of widely varying types. By encroaching upon natural buffer zones (riverbanks for example), uncontrolled urbanization disrupts the water cycle and its natural shock absorbers. The increasing number of cases of polluted water resources bears witness to their growing vulnerability. As a result of these multiple restrictions, many developing countries have initiated sectoral reforms to provide answers to four hurdles blocking access to basic services:

- **Management of raw water draw off**

Many developing cities with abundant water resources are now facing water shortages due to their rapid growth and to the over-exploitation of their raw water resources. The depletion of resources and the deterioration of their general quality make it even more difficult to supply urban populations with drinking water.

- **The redistribution of responsibilities among public authorities**

Decentralization policies are designed to radically change the balance of power, and to clarify the respective roles and responsibilities of the various public authorities in charge of organizing public services.

- **The implementation of technologies and management methods suited to the needs of communities**

Coherent and effective management of potable water supply systems and the scheduling and carrying out of their extension programmes necessitates the use of specific tools employed by professionals in the water sector.

- **Mobilization of the capital needed**

At the present time, investment in water supply and sanitation systems the world over (70 to 80 billion dollars per annum) is too small to effect any real change in the current situation. The majority of states and cities suffer from chronic budgetary and financial problems.

The results of the reforms undertaken since the mid 1980s, their concrete impact for consumers and the durability of management systems vary greatly from one country to another, even when the organizational choices made have been similar. But despite many implementation problems, the influence of regional megacities and secondary urban centres is growing as a result of these policies. **However, water and sanitation services are in competition for funding with other urban services that are just as essential (housing, collection and treatment of household waste, public transport, etc.). The urgency of investment in water projects is emerging at a time of increased competition for global financial resources.**

> The efficiency of public services is a key to the economic development of cities

"Globalization works thanks to an international network composed of 400 metropolises."[1] Sharp competition has developed among these cities in their attempt to attract foreign investment. In vying for funds, whether on an international scale or among the cities of the same country, the efficiency of a city's public services is becoming as indispensable as that of its economic system. A lack of services hinders both the development and competitiveness of cities. **Building and maintaining major sanitation and potable water supply systems, and ensuring energy supply and urban transport contribute to the economic development and attractiveness of regions.**

The experience of Bangalore, the administrative capital of the state of Karnataka in Southern India, testifies to this reality. The city concentrated its economic take-off on the exportation of data processing software, based on a key comparative advantage: the first Indian university training engineers in information technologies was set up in this city. But the development of an urban business based on the production of non-material goods faces new challenges, notably that of providing effective public services to a growing population. Public authorities encounter problems in trying to ensure the supply of energy, water and a suitable urban transport system. Other Indian cities are ready to follow suit to achieve the exceptional position occupied by Bangalore today.

Figure 0.7

As a result of the urban explosion and virtually limitless needs in the water sector, states and municipalities have opened their doors to a wide range of management methods, calling in new players to satisfy the day-to-day needs of their citizens as best they can. The participation of these new entities has an effect on the management and organization of services. Professional operators, for example, transfer their capabilities within the scope of delegated management agreements to provide quantitative and qualitative improvements in various public services. But cities have also seen the rising influence of other types of operators belonging to the informal sector who, despite their small size, palliate some the failings of official departments.

0.3 COMPLEX SITUATIONS IN THE FIELD

The organization of *local water businesses*

The supply of water in areas not covered by public authorities is often more complex than it appears. Unclear legislation concerning property ownership, the multitude of temporary dwellings and the chaotic installation of some populations often prohibit the extension and densification of water supply and sanitation networks by official operators or municipal utility departments.

In the absence of official departments, *local water businesses* spring up to palliate insufficiencies in public supply, but the collection of wastewater is not always provided.

[1]Michel Bassand, "From Urban Environmental Management Towards Sustainable Cities". IREC, International Workshop, Ho Chi Minh City, March 2000.

If populations succeed in obtaining water in cities like Bandung and Jakarta (Indonesia), Dhaka (Bangladesh), and Bamako (Mali), where potable water coverage rates are very low (27%, 30%, 42% and 17% respectively), it is because multiple providers complement the public service supply. Alternative services are widespread in these cities, whether they are individual, family or community, commercial or non-commercial.

> Examples of alternative services

• **Consumers possessing a house connection resell water to their neighbours** (often illegally because the concessionary company or lease-holder does not usually recognize this practice, except in the Ivory Coast).
• **Managers – who are often the owners – of independent supply systems** (borehole, spring, storage facility, distribution network) supply areas that the official system has not yet reached.
• **Standpipe managers**, who themselves are often distribution company customers, and who sometimes possess a special contract. In Niamey (Niger) and Dakar (Senegal), standpipes are the main means of obtaining water in disadvantaged settlements.
• **Tank trucks**, purchase water in bulk quantities from the distribution company or private producers (borehole operators for example) and deliver it to owners of storage facilities, who resell the water to individual consumers in their surrounding area.
• **Water deliverymen** (by cart, donkey, rickshaw, bicycle, etc.) supply water door to door, avoiding the need to wait in line at standpipes (despite the difficulty of the work, delivering water accounts for many full time jobs in a great many cities).
• **Sanitation is ensured by trucks that empty septic tanks** and collect sludge from individual latrines (an essential service in cities where independent sanitation systems are developing very rapidly for families not connected to the public sewerage system).

Figure 0.8

Often accused of proposing inferior service (because health hazards sometimes remain uncontrolled) at exorbitant prices, these intermediary suppliers and independent operators ensure localized distribution to consumers who have no access to supply. Depending on the specific context of where they live, consumers not connected to the public system may be supplied in extremely disparate fashion, ranging from the various levels of service proposed by the official operator (standpipes, storage tanks, house connections), to those offered by local independent suppliers. **Service is thus highly varied, not only in terms of price, but also in regard to water quality and availability. Generally speaking, the more intermediary suppliers there are in the supply chain, the more unfavourable the quality, availability and price of water will be for the end consumer.**

Recent studies have shown that in cities such as Port-au-Prince (Haiti) and Nouakchott (Mauritania), independent operators represent from 50 to 80% of revenues in the drinking water business, as well as a significant number of jobs. Their share of the market in low-income districts is directly dependent on whether or not a local aid programme has been set up by the public water distribution company, as well as on the investments made to extend urban infrastructure into disadvantaged areas.

Local water businesses are typically in close competition with one another and this helps regulate the market. But sometimes markets are diverted and local cartels appear (illegal agreements among operators and intermediary suppliers in a given area, the purpose of which is primarily to fix prices). The pressure of consumer demand is not always enough to balance out the situation.

Moreover, health hazards increase with the number of players. The risk of contamination in the final links of the distribution chain is particularly high because it is often impossible to separate raw water draw-off points from wastewater discharge locations. The domestic storage of water can also be the source of serious contamination problems.

● Neglected sanitation and its consequences on health

The lack of sanitation in many countries throughout the world constitutes a public health disaster. The absence of suitable sewage water collectors increases the risk of coming into contact with excreta, which can be the vector for the development of many parasites dangerous to human health. Nearly half of humanity (three billion persons) is condemned to live without effective sanitation systems and basic hygiene. If no action is taken immediately, in twenty years' time this problem will affect more than 4.5 billion persons. Urgent action is needed to provide sanitation where population densities are greatest and revenues usually lowest. The inhabitants of Kibera, the immense shantytown of Nairobi, put their excreta in plastic bags and then throw them out onto the public roads (termed *flying toilets*). The lack of infrastructure is particularly evident in Africa and Central and South America: 19% of the population in the largest cities on the African continent do not have access to any kind of sanitation system; this figure is 20% in South America.

Urbanization means a greater concentration of household and/or industrial pollution needing treatment, and the likelihood of exceeding the self-purification capacities of aquatic milieus into which effluent is customarily discharged. Diarrhoea and dysentery are frequent and represent 13% of the causes of mortality in children under age 5 in the world (WHO, 2001). The collection of effluent has improved in the past few years, but even so, sanitation remains far behind potable water supply, especially in disadvantaged settlements. Independent sanitation solutions in many cities, provided in conjunction with sewerage networks, are already improving this situation to a certain degree.

The pollution of water designed for human consumption leads to 900 million cases of intestinal worms and 200 million cases of schistosomiasis each year. The United Nations Development Programme (UNDP) estimates that if everyone had access to potable water and sanitation, two million young lives could be saved every year. The accumulation of wastewater in densely populated zones increases the risk of filariasis transmission. Poor populations, who are the most vulnerable, are generally exposed to the greatest environmental hazards.

Because they lack financial means and information, some populations arriving from the country conserve their rural habits, which are not always suited to living conditions in an urban setting. Even where they exist, improvised systems observed in the field are often built of unsuitable materials or are poorly dissociated from water supply lines, thus increasing the risk of contaminating drinking water with wastewater.

According to UNICEF, the number of children who have died from dehydration caused by diarrhoea in the past ten years is greater than the number of victims killed in all armed conflicts since the Second World War.

The installation or upgrading of a sanitation service allows for making substantial savings in terms of lowering infrastructure management costs and improving living conditions. Sanitation therefore has a major and immediate impact on public health.

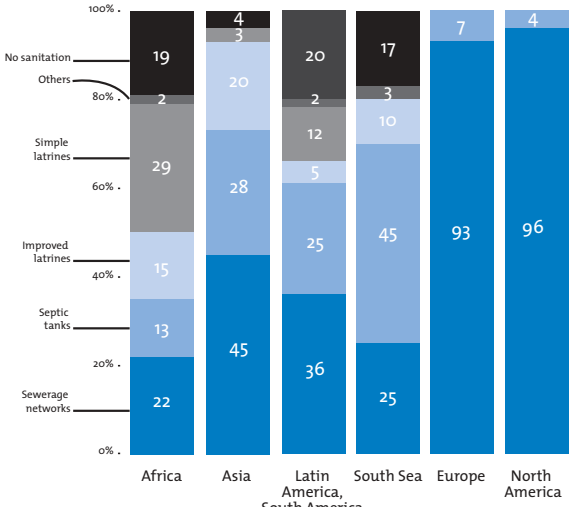
Because investments in sanitation lines were delayed and chlorine was improperly used in drinking water distribution networks (chlorine being the only product that has sufficient residual power to guarantee, without being harmful, effective bactericidal action along dozens of kilometres of pipelines), a cholera epidemic broke out in Peru between January 1991 and June 1992, causing 19,000 deaths. During the 10 weeks corresponding to the peak epidemic period, losses in agricultural exports and tourist income amounted to around USD 1 billion, i.e. more than three times the total amount of investment made in water supply and sanitation systems in Peru in the 1980s. **Poverty does not necessarily slow down improvement in sanitation. Despite their low GNP, some countries (Kenya and the United Republic of Tanzania for instance) have been able to make considerable progress in achieving generalized access to sanitation.**

A FEW EXAMPLES OF THE IMPACT OF INVESTMENT IN SANITATION

- A drop in mortality and morbidity rates
- A drop in health expenditures
- Improved productivity of the active population
- Improved learning abilities of school children
- An increase in school attendance (especially for girls)
- The strengthening of the dignity of persons

Figure 0.9

PANORAMA OF SANITATION SYSTEMS THROUGHOUT THE WORLD



Source: WHO, 2000
Figure 0.10

0.4 MOBILIZING ALL THE PLAYERS

In light of the present situation, all players likely to make effective contributions must be mobilized to increase sustained access to water of quality in sufficient quantity. This concerns local authorities, state authorities, professional operators, NGOs, funding agencies and management committees. The answers are at once technological, financial and organizational, and they concern all stages of the water cycle. **Together, new ways of working as a team must be found to make it easier to implement realistic public service policies that account for the customary practices and needs of all consumers, including the poorest.**

1. Local authorities

Many developing countries are engaged in a decentralization process that delegates important responsibilities (if not the means) to local authorities to ensure public potable water service. Their role is to make sure that inhabitants are provided with public services, and primarily water supply and sanitation. This does not mean that local authorities must assume this responsibility all by themselves, but that they should be able to call in solid partners as needed to help them.

Some municipalities have become actively involved in the sharing of responsibilities with other players in the public, private and even informal sectors. The goal of these partnerships is to implicate all the players in the world of water, whether they are newcomers or more traditional actors having achieved a greater level of independence.

2. State authorities

While making room for a variety of participants in the water supply and sanitation sector, the job of public authorities is to ensure services in the general public interest in conjunction with all interested parties. These bodies alone have the capacity to assume such operations, which essentially consist of defining the rules of the game at various levels (national, local, catchment basin), and in ensuring they are respected. State responsibilities cover:
- the management (both quantitative and qualitative) of all water resources in connection with urban and rural development schemes and in the perspective of sustainable development;
- the setting up of regulations and control mechanisms for various uses of water, the objective being to protect public health (by establishing quality standards), resources and consumers' rights (water tariffs, fair competition, etc.).

3. Professional operators

Whether public or private, national or international, these operators share their technical, commercial and organizational know-how with communities to help them improve the operation and organization of their water supply and sanitation services. Operators must ensure that specific approaches are included to meet the needs and payment capacities of the poorest inhabitants. Moreover, beyond being directly involved e.g., through delegated management contracts, private operators are also capable of investing in emergency humanitarian actions and in development actions.

> The implication of professional operators in emergency humanitarian aid and in development

In 1998, after cyclone Mitch hit Nicaragua and major flooding of the Yangtze occurred in China, Veolia Water decided to set up a permanent humanitarian emergency action unit provided with its own logistics and funds. The purpose of this unit, called 'Waterforce', is to develop and co-ordinate emergency aid actions to supply drinking water to populations who have been struck by war or major natural catastrophes. The programme of action consists of volunteering professional capabilities provided by Veolia Water. **Waterforce** works in partnership with various NGOs and other institutions (the national Red Cross and Red Crescent organizations, the ICRC, the Emergency Unit of the French Ministry of Foreign Affairs, the French Civil Defence Unit, and Catholic Aid). In June 2001, Veolia Water created an in-house programme of action primarily devoted to decentralized co-operation. The purpose of this programme is to devise, in partnership with public players and representatives of citizen groups, solutions designed to improve water supply and sanitation services in the cities of developing countries (**Waterdev** programme).

Figure 0.11

4. Representatives of citizen groups

To compensate for weak municipal structures in the disadvantaged districts of large cities, self-help associations (churches, neighbourhood associations, farm collectives, etc.) frequently contibute to the field of major public services in the sectors of potable water supply, education and health. **The mobilization of local players, albeit low-key, must be encouraged and not forgotten in setting up effective procedures for consulting consumer populations within the framework of a participatory democratic process.**

5. Management committees

Upon completion of construction projects for water supply systems in the disadvantaged areas of major cities and also in small cities, structures that run the operation and maintenance of the new installations are usually set up within the population itself. To allow these management committees to remain mobilized over time, they must be provided with a maximum of means so that they may organize operation of the new facilities effectively. Policies designed to transfer capabilities play a fundamental role in this regard.

6. Small private operators

Whether businesses or individuals, small private operators sometimes negotiate with local authorities to obtain the authorization to distribute water in specific districts. Small operators entertain solid relationships with the neighbourhoods they supply. Water supply and sanitation services in developing cities cannot be upgraded in sustainable fashion without extensive, concerted efforts at a local level. **Because small private operators today supply nearly 30% of the water distributed in urban areas, they must not be excluded from the process of modernization. But local operators do not always possess the technical and financial capabilities nor the manpower needed to handle the problems they are confronted with, nor the means to maintain the services by themselves.**

7. Funding agencies

Providers of capital, funding agencies play a fundamental role in financing projects. Funding agencies include international financial institutions (World Bank, Asian and African Development Banks, etc.), national development banks in some countries, public agencies for multilateral co-operation (United Nations, European Union) or bilateral co-operation, such as the 'Agence Française de Développement' (French Development Agency). The FDA has invested more than 1.5 billion euros over 10 years in co-operation actions in the field of urban water supply.
All these institutions are obliged to adapt their tools to meet the needs of populations as best they can and to support local players as directly as possible. In some cases private operators, commercial banks and other investors may also participate within the scope of suitable financial packages.

8. Non-governmental organizations and international solidarity organizations (ISO)

NGOs occupy an important position among the stakeholders in the world of water. Their origin (both the North and the South), their sphere of action (local, national, international), their activities (ranging from emergency humanitarian action to development aid) and their size and financing methods are extremely varied.

The projects of development-oriented NGOs and international solidarity organizations are focused on community development in both the urban and rural setting. These organizations work directly with the inhabitants, citizen groups, professionals in the sector and local and national public authorities; they work in the field to strengthen capabilities in order to ensure the sustainability of projects.

Humanitarian-oriented NGOs respond to emergency situations subsequent to natural catastrophes, armed conflict, epidemics, etc. In this case the focus is on meeting an emergency need for water supply and sanitation. The operation of these NGOs is based on private donations, but they also receive public subsidies, from the Ministry of Foreign Affairs, for example.

NGOs participate on several levels, often in very pragmatic fashion and in direct contact with populations within the scope of development projects or emergency actions. These organizations are key partners for the other stakeholders in the water sector. The programme Solidarité-Eau (Water Solidarity Programme), set up in 1984 as a result of a European initiative, groups together local authorities, professional bodies (water agencies, water distributors, design offices) and various solidarity associations. Its main goal is to assist local initiatives in the search for international funding while promoting the consistency of actions and the dissemination of technical information.

9. Decentralized co-operation

Direct aid programmes have also been set up by communities in the Northern Hemisphere through decentralized co-operation actions, thus ensuring solidarity between industrialized and developing countries. These actions are mainly focused on strengthening the capabilities of local authorities in the Southern Hemisphere, but also on work in the field involving citizens' groups. It was in this context that the World Summit for Sustainable Development was opened at the end of August 2002 in Johannesburg (South Africa).

Ten years after the first Earth Summit held in Rio in 1992, the fundamental role of essential water supply and sanitation services was once again confirmed. During the Johannesburg Summit, the international community decided to make strong commitments to try to significantly and above all durably improve the international situation in the coming decade. Initiatives and investigations in the water supply and sanitation sector were developed even further during the Third World Water Forum held in March 2003 in Kyoto, Japan.

The heritage of the 2002 Johannesburg Summit and the 2003 Kyoto World Water Forum

JOHANNESBURG 2002

The World Summit for Sustainable Development held in Johannesburg, South Africa, from August 26th through September 4th, 2002 closed with the adoption of a political Declaration and a Plan for implementing provisions aimed at achieving development that respects the environment. After several days of deliberation, the Summit, in which more than one hundred Heads of State and governments participated along with several tens of thousands of representatives of governmental and non-governmental organizations, arrived at important decisions concerning water, energy, health, agriculture and bio-diversity.

Given the complexity of questions tied to sustainable development, the Summit organizers set up a meeting in which all the stakeholders identified at the Earth Summit held in Rio (Brazil) in 1992 were invited to participate. Thus the Summit was marked by the presence of some major groups representing the world of industry and commerce who voiced their concerns and priorities to the international community, to the States of the world, to the institutions of the United Nations and to society in general.

The texts adopted are consequently the result of inter-governmental negotiation processes enriched by multipartite discussions, round tables of Heads of State and governments, and the contributions of private companies. The principal points made concerning the topic of water supply and sanitation are as follows:

- **The problems associated with access to water supply and sanitation services must be considered together and accounted for in any attempt to achieve sustainable development. The final implementation Plan consequently extends the goal presented in the Millennium Declaration** (to lower

by half, the proportion of persons with no access to drinking water by 2015), demanding that the proportion of persons with no access to sanitation be lowered by half by the same date, along with the number of persons living beneath the poverty threshold (at the time fixed at USD 1 per day). The links between poverty and the environment were clearly identified, as was the necessity to lower global threats to public health, which weigh most on the poorest populations, and on children in particular. The infant mortality rate must be lowered by two-thirds for children under five, and the maternal mortality rate by three-quarters in relation to their respective rates in 2000. The mobilization of financial resources, technical assistance and the transfer of capabilities were identified as the priority directions for action.

- **The development of sanitation services must go hand in hand with the promotion of technologies and initiatives for recycling and reusing wastewater to make the maximum use of this resource.** These technologies also help fight the risks of pollution, health hazards and water shortages. Technical and financial aid programmes must be set up to help developing countries obtain the infrastructure and tools needed. Initiatives from the private sector, including major multinationals and private foundations, and also from citizen groups, must be encouraged.

> Priority directions for action promoting access for all to water supply and sanitation services

- Develop and install effective sanitation systems in households;
- Improve sanitation in public establishments and particularly in schools;
- Promote good hygiene practices and health education, primarily with children, who are the principal vectors for sustainable behavioural changes;
- Give preference to the use of technologies that can be accessed by the poorest populations, and that respect the social and cultural practices of the consumers targeted;
- Develop innovative mechanisms for partnerships among players and also in setting up financial packages, principally by associating private and public funds;
- Encourage the incorporation of a sanitation chapter in global strategies for managing freshwater resources.

Figure 0.12

- **An integrated approach covering an entire catchment basin is to be preferred.** All the instruments available for managing sectoral policy must play a part in ensuring equitable access to water supply and sanitation services for all (regulation and control, follow-up and evaluation, promotion of volunteer actions, management of land/property, urban planning, financial tools). It should be recalled, however, that cost recovery objectives must not in any way constitute additional barriers likely to prohibit access to water supply and sanitation services by the poorest populations. National and regional strategies must consequently be developed to improve the efficiency and performance of water distribution systems by lowering losses and increasing recycling.

- **The forming of partnerships between public and private players, supported by stable and transparent governmental regulatory frameworks, is highly encouraged as a means to make progress towards these priority directions for action (see Figure 0.12).** The creation of many 'Type 2' partnerships and other forms of non-negotiated initiatives involving governments, international organizations and the representatives of major companies in the service of disadvantaged populations was announced. In addition to the 218 partnership initiatives submitted to the Summit

Secretariat, the creation of around 60 others was announced. The European Union, for example, announced two major initiatives in the fields of energy and water for which it will invest 700 million and 1.4 billion euros respectively. And of course continued support must be given to existing partnerships. In all these cases, partnerships must devote a very large part of their time to informing, consulting and ensuring the effective participation of the public concerned by the projects implemented. The constant concern of public and private partners alike must be the transparency and continuous evaluation of their actions.

- **The scientific understanding of how the water cycle functions must be encouraged, primarily by supporting cooperative efforts in observation and research** and by sharing experiences and transferring capabilities.

The World Summit for Sustainable Development held in Johannesburg has thus resulted in concrete but also ambitious goals to improve access to water supply and sanitation services in developing countries. In light of the enormity of the task that lies ahead and the urgency of taking a determined stand in relation to major public health hazards, the international community has, once again, underlined the importance of effective collaboration among all the stakeholders, both in regard to concrete action in the field as well as in relation to ideas and the sharing of experiences. It is precisely within this framework that UNESCO, the Programme Solidarité-Eau and Veolia Water have united forces.

During the Johannesburg Summit Nelson Mandela reminded participants of the major role played by water and sanitation services in preserving human dignity.

KYOTO 2003

More than 24,000 participants from 182 countries attending 351 sessions and workshops organized on 38 subjects...what better illustration of the extraordinary diversity and complexity of the topic of *Water*! After Marrakech (Morocco, 1997) and the Hague (The Netherlands, 2000), the third World Water Forum, organized by the World Water Council, was held in Kyoto, Japan in 2003. The Kyoto Forum marks a major step forward in implementing the goals of the Millennium Declaration adopted by the International Community in 2000 in New York, which was further added to during the Johannesburg Summit.

The Forum provided the opportunity for a great number of representatives of citizen groups, local authorities, the private sector, the world of research and governments and administrations to share their experiences and create new partnerships. **Over 100 official pledges were made during the Forum, a few examples of which are provided below:**

- **The United Nations Human Settlements Programme (UN-HABITAT) signed an agreement with the Asian Development Bank to set up a programme to strengthen the capabilities of Asian cities to manage investments designed to help the most disadvantaged, and also help regions meet the Millennium development goals.** The programme includes a USD 10 million subsidy to be managed by UN-HABITAT and the Asian Development Bank, plus a loan of USD 500 million provided by the Asian Development Bank to help finance water and sanitation projects in Asia through 2008.

- **With the help of a consortium of international financial institutions, United Nations agencies, NGOs and research institutes, the World Water Council made a pledge to set up a programme to clearly define the advantages of correct water management and to provide governments with the tools they need to programme and manage their policies concerning water as effectively as possible.**

- The United Nations Human Development Programme (UNHDP) signed an initiative to **strengthen the powers of local authorities to resolve problems linked to water and sanitation.** This initiative has been endowed with a budget of USD 50 million for the period 2003-2008.

- Concerning the Kyoto Water Declaration and indigenous populations, the Forum participants pledged to **set up a network designed to give more weight to local populations** and to strengthen the power of local authorities to help them preserve their rights.

- **Caribbean and Pacific organizations signed an agreement to set up a common action programme for 37 States designed to promote co-operation concerning drinking water, capacity building, the management of data and information, applied research and the sharing of know-how.**

- Through its "Water for Life" initiative, the European Union and its partners pledged to promote efforts to achieve the goals set at the Johannesburg Summit, i.e. to increase access to water supply and sanitation. **The European Union pledged in particular to strengthen co-operation efforts and to increase its financial and technical support programmes in the water sector.**

Other key subjects discussed during the Forum include the following:

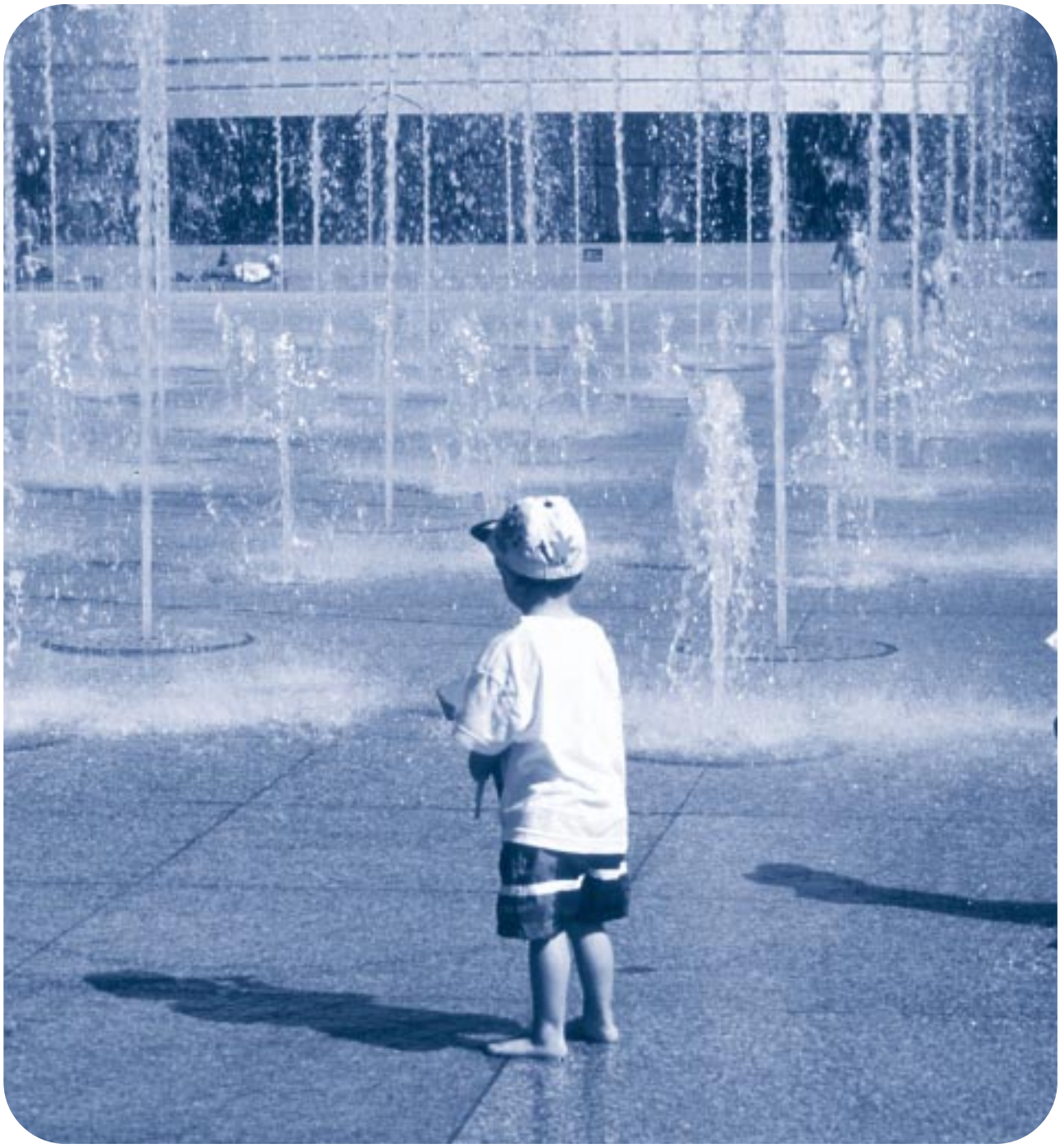
- **The question of governance**: the final declaration of the Forum stresses that in addition to facing water crises, many countries are also confronted with problems of governance because their socio-political and administrative system is neither sufficiently reliable nor transparent. To achieve the integrated management of water resources, **transparent and interactive procedures capable of meeting human and ecological needs must be implemented.**

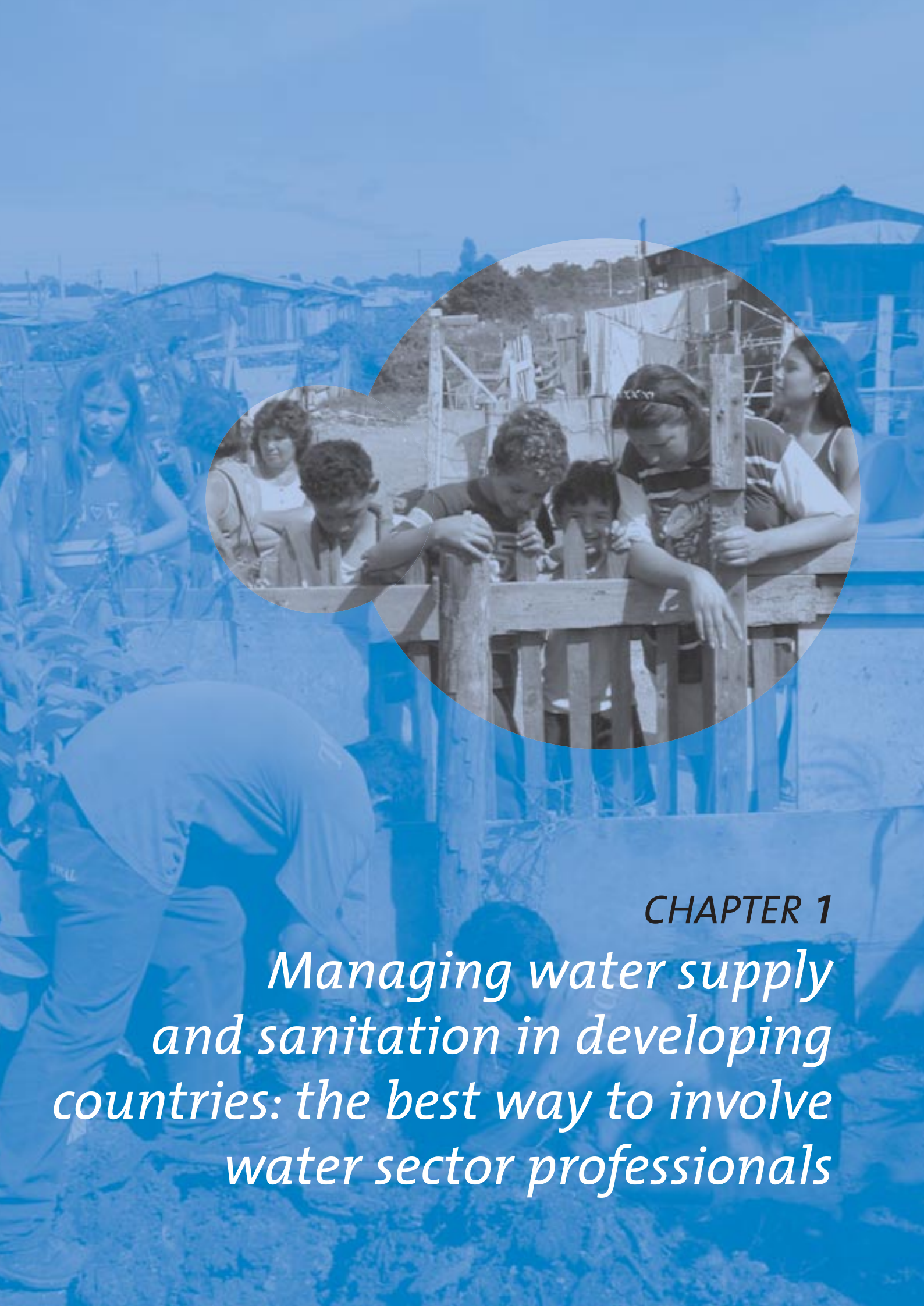
- **The question of strengthening capabilities, or capacity building: it is essential, via education and access to information, to strengthen the capabilities of stakeholders (individuals, organizations) at all levels so that they may understand, decide and act.** This is an important condition for ensuring the effectiveness of water management methods. But priority must be given to the participation of local institutions in this process, to promoting equality between men and women and to respecting cultural diversity and traditional know-how.

- **The question of participation**: the various stakeholders, elected officials, parliamentarians, local populations (men, women and children), workers (public or private companies), unions, heads of businesses, experts, reporters..., all have an opinion that should be heard. **Water management implies the involvement of a great many parties, and the setting up of partnerships among them is essential.** Participative approaches must therefore be implemented, in particular at a local level.

- **The question of financing the Millennium development goals: this question was raised and discussed during the Forum, notably as a result of the work of the 'World panel on financing infrastructure in the water sector', led by Michel Camdessus. The panel's report underlines the importance of improving and diversifying traditional financial sources and the guarantee mechanisms set up to protect those who outlay the capital.** It stresses the importance of regional development banks, encourages the development of local financial markets and pleads in favour of greater autonomy for local authorities and other infra-national organizations to access funding (while recalling the basic role played by national public authorities in defining a policy and national plan for using water resources). And finally the report recommends doubling the public development aid (PDA) presently set aside for the water sector around the world, primarily in order to send out a positive message and attract other investments.

The work of the Camdessus Panel on the funding of infrastructure in the field of water revealed in particular the importance of political decisions in industrialized countries, beyond any technical problems that might exist concerning the mobilization of funds. **The Kyoto Forum has taken a major step forward in mobilizing political decision-makers. A privileged moment for encounters and the sharing of ideas and experience, the Forum worked to extend North-South solidarity initiatives, mobilizing the energy of all those present in the service of human dignity.**





CHAPTER **1**

Managing water supply and sanitation in developing countries: the best way to involve water sector professionals

CHAPTER 1
Managing water supply and sanitation in developing countries: the best way to involve water sector professionals

To achieve sustainable urban development, the management of services in the water sector must be carefully thought through, and new financial resources found. In both these fields, professionals may be called in from either the public or private sector. When players from the private sector become involved, how their participation is organized will directly affect how the partnership with the public organizing authority functions. What types of contractual schemes are best suited to the diversity of local contexts in developing countries?

1.1 The central role of organizing authorities
1.2 The responsibilities of local authorities
1.3 The options for developing countries
1.4 Two African case studies

1.1 THE CENTRAL ROLE OF ORGANIZING AUTHORITIES

Water management at the national, regional, city or catchment area level is a complex process involving many economic and social players. The importance of cultural factors must not be overlooked in trying to understand how these various powers are interrelated. As early as the 9th century, the water supply system of the city of Fez in Morocco reflected a specific social organization, since water coming from the wadis first passed through the palaces (political authority), then through the mosque (religious authority) before being distributed in the city.

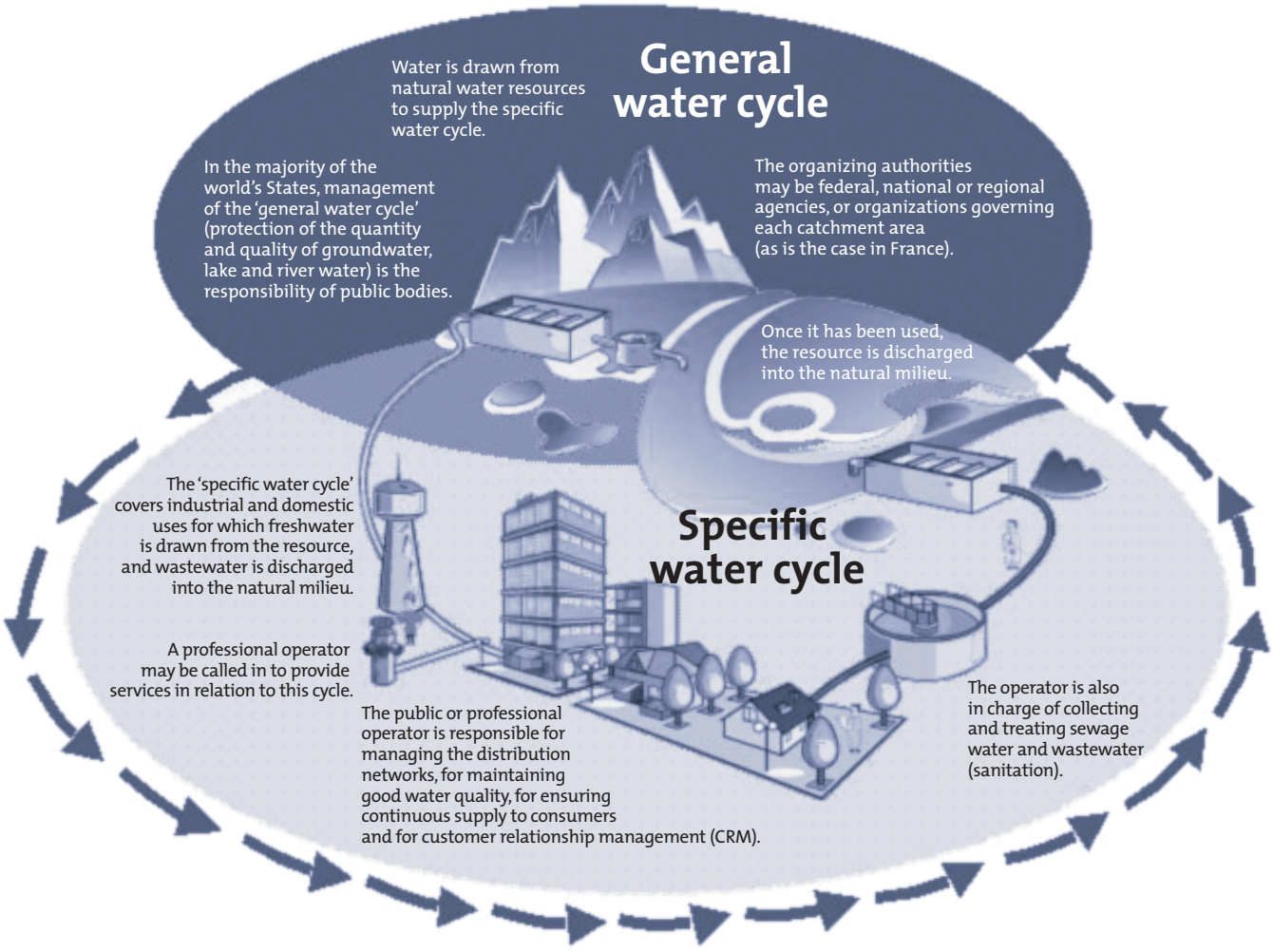
To thoroughly **grasp** the complex functioning of the water cycle, a distinction must be made between the '**general water cycle**', i.e. that of the natural resource itself, of how it is protected and shared among various uses, and the '**specific water cycle**', which concerns the services and uses associated with a specific resource. Two main categories of capabilities, and above all of responsibilities, correspond to these two cycles:

- **Management of the natural resource** (authorization and monitoring procedures for water intake in the natural milieu): how management is shared among the different categories of consumers, along with environmental protection measures (authorization and monitoring procedures for wastewater discharge into the natural milieu, and waste management) are the responsibility of public organizing authorities.

- **Management of drinking water supply and sanitation services:** this is usually the responsibility of a local structure (municipality, municipal company), which may or may not decide to transfer operation of the installations to external partners who are water sector professionals .

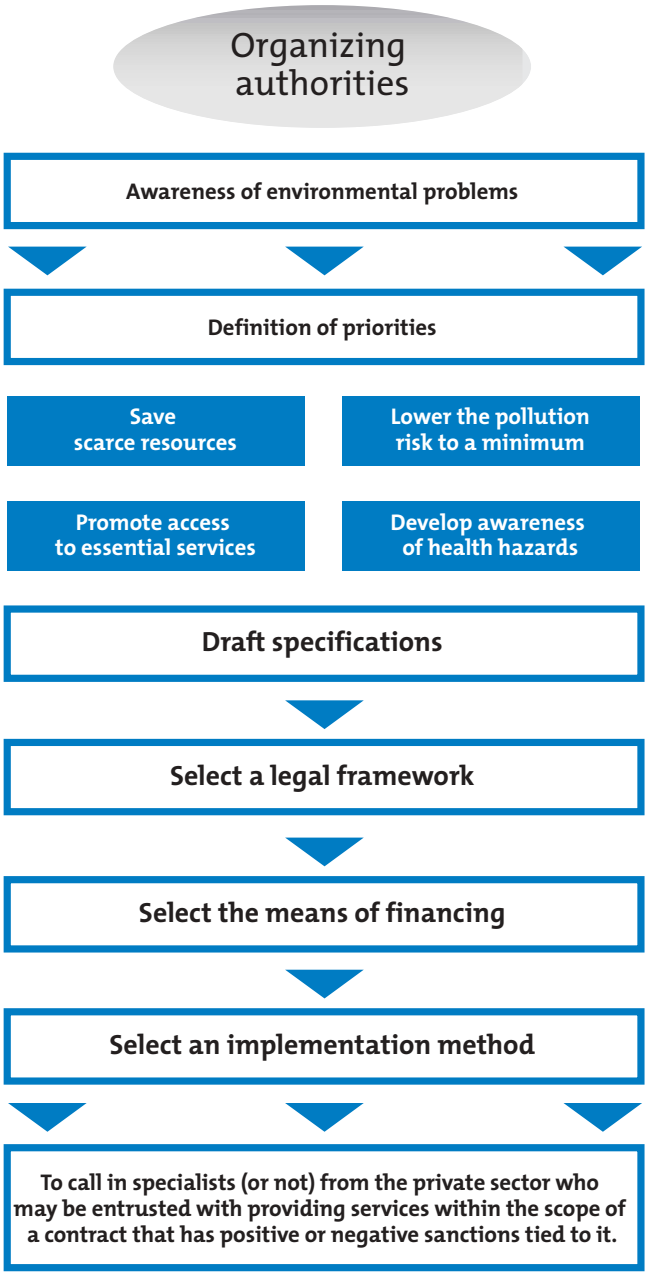
The overall organization of the sector, the definition of priorities, the monitoring of the application of legal provisions and the quality of the public service remain the responsibility of the national administration and its decentralized departments, the organizing authorities. If the decision is taken to call in private professionals to carry out specific services, they should be performed within the general framework defined by the organizing authorities, and will usually concern the 'specific water cycle' only.

GENERAL AND SPECIFIC WATER CYCLES
Figure 1.1



Before contacting a private partner to provide specific services, **organizing authorities must be fully aware of the relevant economic, social, cultural and environmental issues at stake.**
The purpose of such an approach is to best define the priorities of a sustainable development policy (saving resources, lowering the risks of pollution, equity of access to essential services, etc.). It is on this basis that public authorities will be ready to draft precise specifications for national, regional and/or local levels before they select a legal framework, the appropriate means of financing and a method of implementation ensuring that the goals set are attained in the best possible conditions.

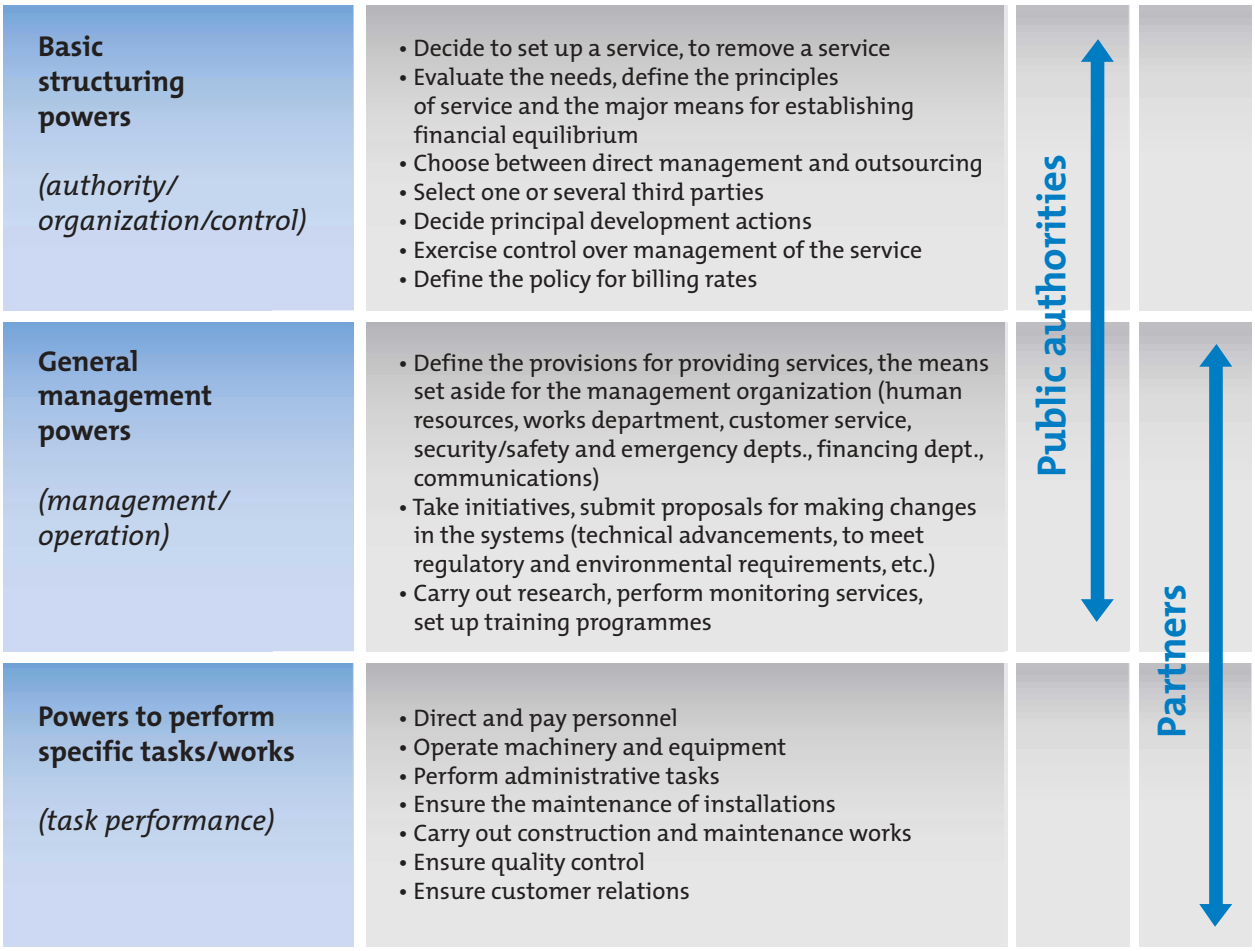
EXAMPLE OF A DECISION CHAIN FOR ORGANIZING AUTHORITIES
Figure 1.2



In the event that a partner from the private sector is called in by the organizing authorities, his range of action and responsibility must be precisely defined. To accomplish this, the level of the private partner's involvement must be selected from three possible options: power to create, power to ensure general management, power to perform specific tasks or works. The clear breakdown of roles and areas of participation is a key factor for ensuring the viability of a contract signed between the public authority and a private service provider.

THE THREE LEVELS OF THEORETICAL POWER WITHIN ORGANIZATOINS

Figure 1.3



The new organization of the water sector in Niger provides an excellent example of how roles have been shared between public organizing authorities and (a) private partner(s). The new National Hydraulic Plan (NHP) and its component in charge of urban development, the Sectoral Water Plan (SWP), set up to act as the interface between the Nigerois government and funding agencies until 2006, was implemented in 2001. This new organization is a result of the determination of public authorities to build an independent and financially viable sector capable of ensuring the supply of potable water to its inhabitants in sustainable fashion and at the least possible cost. The Ministers of the Plan and of Water Resources defined the major goals of their water policy in their letter on sectoral policy for urban hydraulics:

- To better understand and monitor resources;
- To increase the value of these resources by improving organization of their structures and systems;
- To improve coverage of the population's demand for water, primarily by implementing a rehabilitation and maintenance programme for existing installations;
- To support all production sectors by searching for the best possible equilibrium among investment, operating and maintenance costs for hydraulic infrastructure;
- To involve local authorities in the management sector and make them responsible, primarily by transferring specific areas of State capacities to them;
- To promote the participation of the private sector and citizen groups in managing the water sector by strengthening their capabilities;
- To seek the full participation of populations in designing and carrying out works, in clarifying and respecting the roles of the various partners involved and in securing management rights.

The State thus reorganized the entire sector of drinking water distribution in urban and semi-urban areas by creating a water heritage company (WHCN – Water Heritage Company of Niger) and a water management company (WSCN – Water Supply Company of Niger). The activities of the previous National Water Company (NWC) were transferred in part to the WHCN and in part to the WSCN. These new companies are bound together by a 10-year leasing contract. The first company is public and finances major structural investments in the supply systems (treatment plants, storage tanks, new networks composed of large-diameter pipelines); it also makes resources available to the second company, which manages the supply system, ensures its effective functioning and installs new smaller diameter branch lines that improve coverage of the population's water requirements.

> The sharing of responsibilities among the various players in the water sector in Niger

✓ **The State** defines sectoral policy, manages water resources, monitors the condition of the environment, and drafts the legal and regulatory framework as well as billing rates policy;

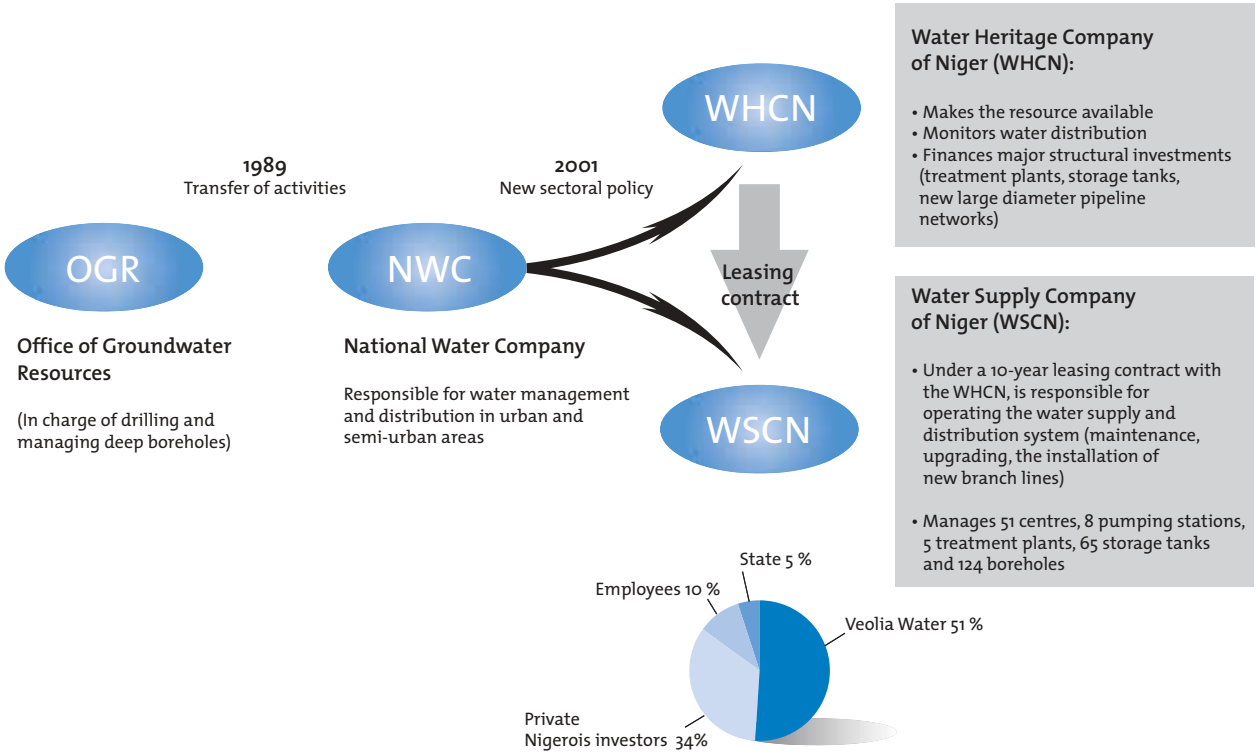
✓ **The multi-sectoral regulation authority** ensures the application of legislative and regulatory texts, protects the interests of both consumers and operators (paying special attention to transparency and objectivity), implements mechanisms for joint collaboration and ensures that the financial, economic and social equilibrium of the system is maintained;

✓ **The WHCN** manages the resource (enhances its value, ensures value for money), prepares master plans, seeks funding, acts as owner for the rehabilitation and upgrading of existing systems, for new installations and network extensions, and organizes public information campaigns;

✓ **The WSCN** operates and maintains the system, ensures the renewal of operating equipment, connections and meters, oversees network rehabilitation, renewal and extension financed through its own sources, ensures billing and bill collection, manages customer relations, ensures sanitation around supply points, protects intakes and well fields, and monitors the physical/chemical and bacteriological quality of the water distributed.

Figure 1.4

REORGANIZATION OF THE WATER SECTOR IN NIGER
Figure 1.5



1.2 THE RESPONSIBILITIES OF LOCAL AUTHORITIES

The development of local public services of quality (for the supply of safe drinking water and sanitation, but also for public transport, waste treatment etc.) is necessarily a part of the sectoral policies defined by national public authorities, or in some cases by federal authorities. In the case of Niger (see above), the State was directly involved in defining the main strategic choices covering reorganization of the water sector for the country as a whole. A private partner, Veolia Water in this case, signed a contract with representatives of the State, and not with any specific local authority.

However, in more densely-populated countries covering larger territories and with several big cities or even several megalopolises (urban complexes with over 8 million inhabitants), and where regional contexts may vary widely (federal States like Brazil or Mexico for instance), it is increasingly becoming standard practice to place the local authority at the centre of organizing access to essential services.

To achieve sustainable development at a local level, elected officials and managers of municipal departments must be able to make modifiable and informed choices concerning the future of their public services. They know the city better than anyone; they are aware of the waves of migration that have led to its creation, of the urban crises the city has already faced, and naturally, of the specific expectations of its consumers.

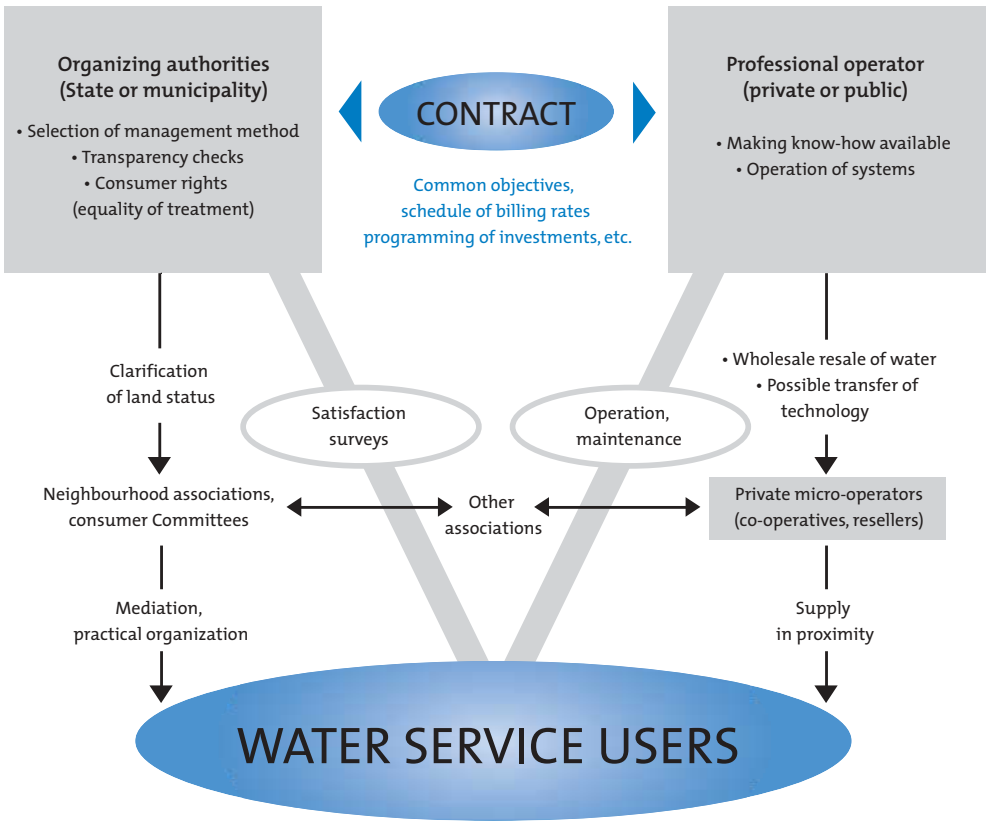
These are the people who know most about the city's resources, the problems it faces, and the extent of the need to upgrade urban services. From a practical point of view, there are three basic reasons for preferring the local handling of water supply and sanitation questions:

- **The high cost of transport** (the distribution of water usually represents the largest share of the total cost): water must be produced, distributed, then collected and treated in proximity to end consumers. Water supply and sanitation services differ in this regard from electricity, gas or even telecommunications services, for which major long distance transport and transfer lines already exist.

- **Their influence on urban development policies:** the structural impact of water supply and sanitation services on the urban landscape is now unanimously recognized; the installation of new distribution lines or collectors implies regularization of land use and land ownership, and is the direct concern of the local public authority.

- **The day-to-day management of water supply and sanitation services involves a great number of local stakeholders** (neighbourhood and consumer associations, management committees, small local operators, representatives – elected or not – etc.) Managers, whether public or private, must thus maintain close relations with these parties to ensure system equilibrium.

WATER SUPPLY AND SANITATION SERVICES ARE PROXIMITY SERVICES INVOLVING MANY LOCAL PLAYERS
Figure 1.6



But in many urban complexes in developing countries, the public management of urban services is becoming more and more difficult. With the rise in demand and the development of new environmental pressures, municipal departments are obliged to extend networks and schedule the construction of new infrastructure. At this point, four major hurdles arise:

- **The limited availability of public funding**, which is often the cause of major delays in upgrading urban networks (In the 1990s, for example, the water distribution system in the city of Buenos Aires in Argentina, with a population of over 11 million, only covered the needs of 6 million persons.)

- **The emergence of management problems** is sometimes the cause of deterioration in the quality of service. Insufficient customer management, long delays before any action is taken and low bill recovery rates are some of the reasons that have led to the restriction of financial capacities of public companies and to the neglect of certain consumer categories.

- **The difficulty of co-ordinating various municipal departments** that are more or less directly involved in the organization, monitoring and/or practical management of city water supply and sanitation services (respective responsibilities often being very poorly defined among the departments in charge of housing, land status, municipal statistics, urban planning, etc.).

- In some cases, **the absence of national public operators possessing the means and technological capabilities needed** to upgrade the system's networks (the setting up of a geographic information system, lowering unaccounted-for water losses, etc.).

In light of this situation, strengthening the role and capabilities of local authorities and recognizing their status are essential steps towards sustainable development.

The steps taken to strengthen the sphere of action of local authorities must be associated with decision-making processes at both the national and international level, and their means of action must be fortified. Since the summit held in Rio in 1992 and the Habitat II Conference held in Istanbul in 1996, networks of local authorities have been created worldwide to give them more weight on the international scene and to make their demands heard. These networks have undertaken many actions included in Agenda 21 (Figure 1.7) at a local level as part of strategies for sustainable development.

Parallel to the World Summit for Sustainable Development held in Johannesburg, a working session for local authorities was organized by the International Council for Local Environmental Initiatives (ICLEI), under the authority of the World Associations of Cities and Local Authorities Co-ordination (WACLAC). Local authorities from more than 700 communities from around the world participated in this working session. However, even if the United Nations currently gives more and more weight to local authorities as mediators during international negotiations and joint collaboration efforts, references to these bodies remain infrequent in official documents. In the Action Plan issued by the Johannesburg Summit, only paragraph 149 refers to their role explicitly.

In a period when state involvement has a tendency to decrease in light of the enormity of the work to be done, the responsibilities given to local authorities to manage sustainable development issues at the local level (and primarily to provide access to the essential services of water supply and sanitation) must be confirmed and recognized by all those involved.

1.3 THE OPTIONS FOR DEVELOPING COUNTRIES

Local authorities generally have two possibilities for managing public services. Either they opt for direct control, i.e. they manage services with their own resources (human, material, financial), or they set up an indirect management system, i.e. they entrust all or part of service management to a third party by signing a contract with an operator who is paid a fee, or by delegating the service. With public service delegation, the co-contractor either obtains a substantial part of his fees from consumer revenues, or is paid in relation to the results of the service provided.

There is still much confusion concerning the principal ways in which private professional operators can be involved in the management of water supply and sanitation services in countries undergoing development or transition. As was pointed out in the first part of this Chapter, the work of professionals from the private sector called in to perform specific services (if the public organizing authorities deem this appropriate in light of the specifications they themselves have defined) usually concerns *the specific water cycle*, i.e. water uses and services.

> Agenda 21: a commitment to sustainable development

During the United Nations Conference on the Environment and Development that was held in Rio de Janeiro in 1992 (Earth Summit), a number of countries confirmed their commitment to sustainable development by signing Agenda 21. This proposes keys for the implementation of sustainable development in the 21st century at national, regional and local levels. Agenda 21 is organized into 4 sections with a total of 40 chapters: **social and economic factors** (co-operation, demographics, health, etc.), **natural resources** (the atmosphere, biodiversity, freshwater, waste, etc.), **major population categories** (women, young people, native peoples, communities, etc.) **and means** (financing mechanisms, technological transfers, education, etc.).

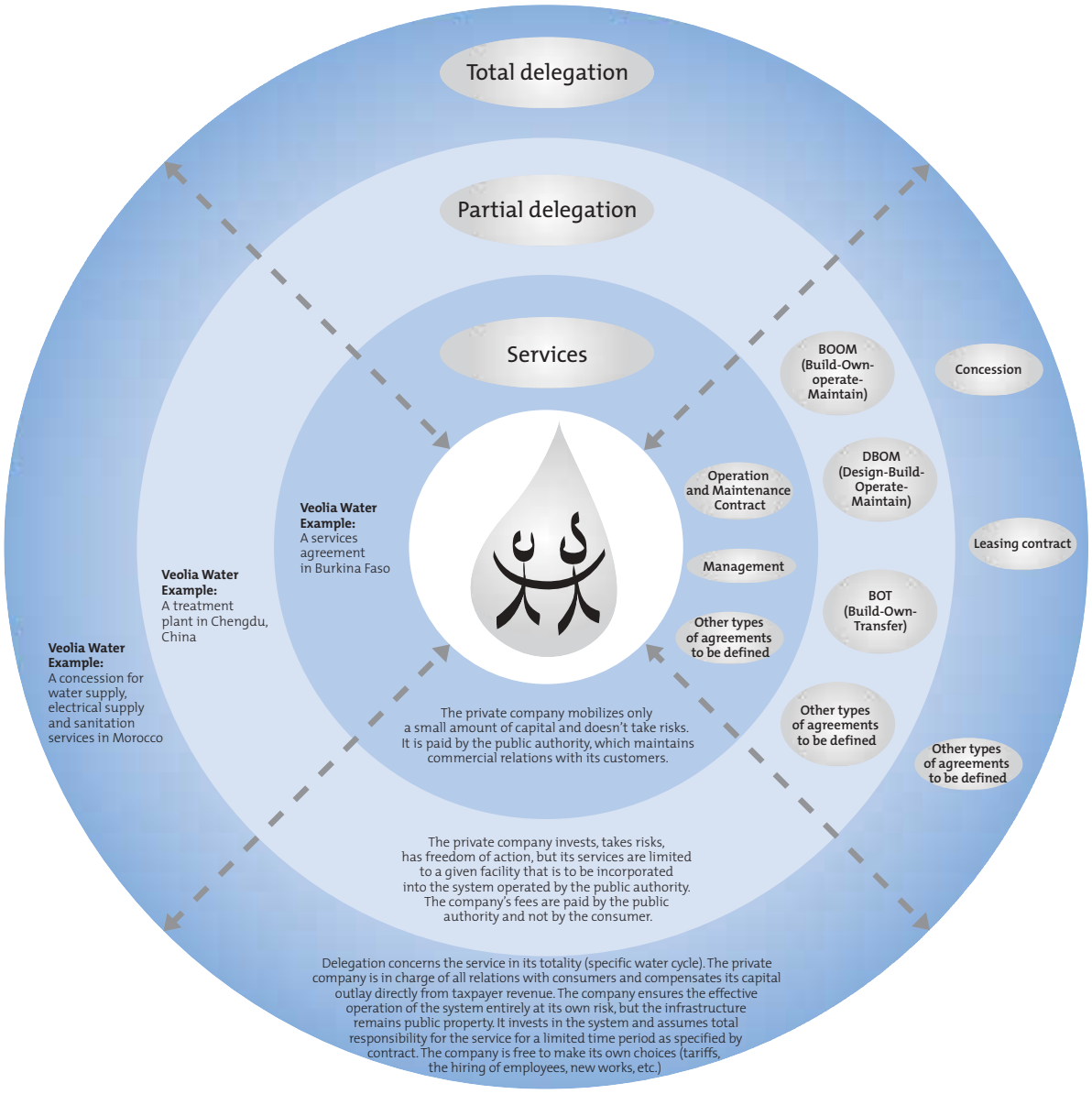
Report of the United Nations Conference on the Environment and Development
Rio de Janeiro, June 3-14, 1992

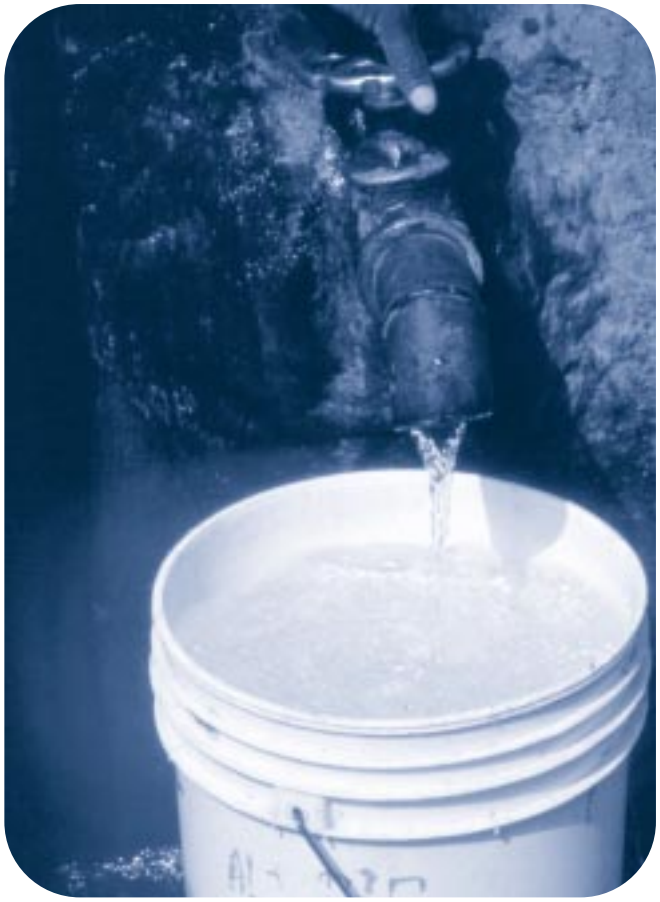
Figure 1.7

The concept of *public service delegation* is fundamentally different from that of *privatization* insofar as the former does not imply the definitive transfer of infrastructure ownership – and consequently of the public heritage – to one or several private partners.

Before competitive mechanisms for water distribution and sanitation management can be introduced, partnerships between public authorities and private sector professionals must first be organized. Setting aside the extreme case of infrastructure privatization (such as that found in the United Kingdom), several kinds of delegation are possible: limited, partial or total. The public entity entrusts to a third party all or part of its system management powers, but maintains authority over, organizes and controls the service. In this instance the activity has been outsourced and not, as is sometimes said, privatized.

DIFFERENT TYPES OF PARTNERSHIP WITH WATER SECTOR PROFESSIONALS
Figure 1.8





Transactions undertaken in developing countries are characterized by a high degree of uncertainty affecting both private partners (operators, subcontractors, funding agencies) and public partners (particularly local authorities). The private operator faces an environment that is sometimes hard to control. It is often difficult to assess with any certitude the real state of repair of the installations and the private operator is thus obliged to act prudently in negotiating and defining his services. In addition, he is usually required to mobilize major financial resources for a return on his investment that is often uncertain and which can involve sizeable risks.

Local authorities often lack experience in partnerships with the private sector and are particularly vulnerable to price increases and to discrimination in ensuring service to the various consumer categories (stopping service to populations with low incomes because their network extension costs are the highest).

The preparation of a delegated management agreement is consequently a key component in the setting up of solid relationships between public and private partners. It consists of several phases and involves many stakeholders: the local authority (ies), who has (have) drafted the initial specification, the public authorities in charge of supervising the bids for tender, one or several operators who have been selected, and any international institutions associated with the project. Partners usually apply 'typical' contract clauses even though no model exists that can be reused directly: the diversity of the legal, political, economic and cultural contexts lead to many adaptations and to the development of original solutions.

The extensive complexity of preparing agreements for delegated management has many consequences. Partners are often obliged, at the very advent of negotiations, to call in legal advisors specialized in the local context and/or in international regulations concerning major investment projects. But the multiplication of this expertise can sometimes be harmful insofar as they contribute to increasing the cost of managing the bid for tender procedure. They also tend to make everyone forget that **before becoming a struggle of opposing forces, the agreement is above all a partnership whose success depends on respecting the interests of all stakeholders in an atmosphere of mutual trust, and thus in the greatest possible transparency.**

Special clauses must be drafted to account for the specific context of safe water supply and sanitation in disadvantaged settlements. These clauses must identify criteria for differentiating between 'typical' and 'atypical' areas, the levels of service to be provided and the operator's specific obligations, the financial arrangements needed for network extensions, the payment ratios considered as 'acceptable' and the method of calculating supply rates.

Despite careful preparation, modalities for periodically revising the agreement must also be included to allow for redefining objectives at the appropriate moment. A good dose of realism favours the incorporation of data that become more finely tuned as the collaboration effort takes shape.

> The agreement is the key to public service delegation

- Service delegation is expressed through a freely negotiated, very carefully drafted agreement (the owner of the service being assisted in this task if necessary).
- The agreement must include extremely precise adaptation clauses so as to ensure effective adjustment in foreseeable conditions.
- The contract must legally govern the parties who sign it and so must include solid guarantees for each of them in the event of litigation.

Figure 1.9

EXAMPLES OF WAYS TO ADAPT CONVENTIONAL CLAUSES IN DELEGATED MANAGEMENT AGREEMENTS TO ACCOUNT FOR DISADVANTAGED SETTLEMENTS AND LOW INCOME CONSUMER POPULATIONS

Figure 1.10

	'Typical' contractual obligations		Possible improvements
	Conventional phrasing	Disadvantages for marginalized populations	
Exclusivity	Public authorities confer exclusive rights to the private operator within a specific area defined contractually.	In disadvantaged settlements not supplied by the system (but included in the area), the incorporation of an exclusivity clause makes supply by the informal sector illegal (wells, resellers, etc.), reducing the choice of service for poor households.	Limit this clause to areas already supplied by the public potable water distribution system. The cost of accessing public service is sufficiently high without adding a 'legal' exclusivity clause. For areas where there are no networks in the short term, small private operators – in partnership or not with the 'official' private operator – can also ensure water distribution.
Network extensions	Some agreements require private operators to connect households that aren't yet customers within a very precise period of time. A goal of this type could be expressed, for example, by the number of connections to be provided, or again by setting a 'target' rate of service.	It is often a problem for a private operator to attain such goals on the basis of data that are not very reliable (notably statistics). Some provisions sometimes even oblige the consumer to hook up to the system as soon as it passes close to his/her dwelling, even if no aid has been planned for covering the cost of the connection.	This requirement may be very effective in the short term (less than 5 years) in guaranteeing access to water for all, but long term estimates for connection are quite unrealistic. The criteria making service mandatory must be explained in detail in order to avoid excessive connections. Alternate means could be made 'official' or could at least be tolerated (at least temporarily) to facilitate system extension.
Tariffs	The contract often imposes an 'adjusted' schedule of rates (organized by successive income levels, for instance); in return, the operator benefits from special subsidies provided by the public authorities.	Only consumers already connected will benefit from a schedule of billing rates of this type. Rates are often inaccurately defined (initial income cut-off point too high, utilization of lump sums, etc.). This system does not directly encourage the private operator to expand the system.	Measures (primarily financial) must be taken in parallel to facilitate connection.
Bill collection and recovery	The rules governing payment procedures, time lapses for reminder letters, and any penalties for late payment are very general; they don't account for the everyday reality of disadvantaged consumers.	The percentage of unpaid bills is often high due to the precariousness of income. Moreover, the presence of intermediaries is likely to modify the relationship between the operator and the end customer.	Ratios could be defined to monitor status (amounts received/amounts billed for instance) and special clauses could be added (recourse for bill recovery, social clauses, creation of solidarity funds, the setting up of community awareness programmes, etc.).
Financial arrangements	The amount paid to third parties (to the local authority or to specialized agencies) is often based on the amounts billed.	The rate of unpaid bills is high.	The payment could be based on amounts received. Special payment arrangements and subsidies could be provided.
Technical specification	Agreements sometimes refer not only to the results expected in terms of service, but also to the techniques to be employed.	Specifications that are too rigid may hinder the attainment of objectives and impede the installation of sustainable house connections welcomed by consumers.	Flexibility must be incorporated in defining the services proposal so that operators can include disadvantaged settlements under the best possible conditions.

For full delegation of a public service, either a concession agreement or a leasing contract is drawn up with the local authority.

- **The concession:** the private operator is the exclusive manager of the installations that he runs for a predefined period of time. His right to use the installations and obtain revenue from consumers is defined contractually in return for providing a predefined level of service and for implementing an investment plan. He is responsible for the installations, for their maintenance and for financing their renewal, but the installations are returned to the owner (the local authority) at the end of the concession.

- **The leasing contract:** the local authority retains ownership of the infrastructure throughout the entire duration of the contract, takes investment initiatives and finances them. The private operator is responsible for system operation and maintenance, and at least partially for its renewal. He is paid from consumer revenues according to the terms defined in the lease.

In signing a delegation agreement between a private operator and a public authority, it is normal for the latter (whether a state or municipal body depending on the extent of decentralization) to monitor the agreement it has itself negotiated with the private partner. In some models of sectoral reform, the concepts of delegating power, of 'delegator', arbiter and controller overlap and sometimes lose their meaning. Depending on the context, it may be necessary to call in exterior means of control, but the creation of independent bodies, such as those set up in Argentina (ETOSS Agency) or in the Ivory Coast (National Water Authority), frequently strips the public authority of this essential responsibility. To avoid this, the public authority can create a specialized multi-disciplinary team (legal advisors, technicians, elected officials, etc.) within its own organization. Obliged to adhere to very strict rules to ensure transparency, the task of this team would be to monitor the effective performance of the agreement and to ensure that a relationship of trust is maintained with the private partner.

In conclusion, a fair and flexible agreement is the key to the success of delegating the control of a public service (similar to that which functions in France, for example). The delegation agreement must be designed to meet three main objectives:

- It must provide the public sector with the means for monitoring – and if necessary for encouraging or reorienting – the actions of one or several private professionals to ensure that responsibility for the service is taken over in the best possible conditions, that the principle of equality of access is respected, and that the investment plans for the extension and densification of existing networks are optimized, etc.

- It must guarantee that inhabitants, whether customers or not, benefit both quantitatively and qualitatively from the involvement of one or several private professionals, ensuring that essential needs are covered, that public property is effectively maintained, that billing rates are reasonable and that neighbourhoods are consulted and their demands accounted for, all of which must be in the respect of cultural diversity and democratic principles.

- It must give private operators the guarantees and latitude of action they need to allow them to honour their contractual commitments by selecting the best strategic options for sound management of system operation (while incorporating their specific requirements in terms of recovering costs and expected profitability).

1.4 TWO AFRICAN CASE STUDIES

Gabon: An experience in delegated management

After completing an institutional reform in the electricity and potable water sectors in 1993, the government of Gabon decided to transfer management of these services to the private sector in 1996. It began looking for a prestigious partner for the Gabon Energy and Water Company (GEWC), a company in which it was the major shareholder. With the help of the International Finance Corporation, a subsidiary of the World Bank, an international call for bids was sent out in 1997. Veolia Water was selected to become the major shareholder in GEWC, with a 51% share, the remainder of the capital being held by Gabonese investors. Delegating the management of these services corresponded to the decision to disengage the government from their financing while ensuring their extension and improvement.

The specific features of the 20-year concession agreement, begun in July 1997, include:

- **a major decrease in tariffs at the time of the call for bids:** water and electricity rates were lowered by 17.25%, with the formula for revision based on changes in production costs (fuel, equipment, personnel);

- **the management and maintenance of both water and electricity combined**, for both historical and economic reasons (to make scale economies in terms of sales and to allow for switching subsidies from one sector to the other as required);

- **the objectives to be met during the concession period concerning the expansion of service to inhabitants**, organized by geographic area (urban centres, isolated areas).

Due to its oil, Gabon is often thought of as a rich country. But poverty is nevertheless present in this region of Africa. Living in isolated towns in the forest and the peripheral areas of urban centres, poverty-stricken populations are also sometimes found in city centres. At the present time two mechanisms have been set up to facilitate access to basic water supply and sanitation services for the most disadvantaged populations:

- **a special low hook-up fee for disadvantaged households**, combined with special billing rates for a monthly consumption figure of not over 15 cubic meters. 24-month interest-free credit can be obtained to pay for the hook-up. By the end of 2001, the number of connections of this type was 11,320, representing 15% of the total number of house connections.

- **free access to public standpipes for inhabitants:** each cubic meter of water consumed is paid for from a fund which all customers pay in to (except those who benefit from the special low rates).

At the end of 2000, the rate of service was much higher than the goals set in the agreement in all the zones supplied, having increased by over 30% in four years. In the coming few years, the focus will be on isolated towns.

INCREASE IN THE RATE OF SERVICE FOR DRINKING WATER SUPPLY IN GABON *Figure 1.11*

	Concession agreements		Results of the survey taken in 2000
	Results recorded in 1993	Goals set for 2000	
Libreville supply system	49.3	53	61.3
Franceville	38.6	43	58
Port Gentil	37.7	43	49.5
Isolated towns supplied in 1996	33	38	40.1
Isolated towns needing service	0	12	7

COMPARISON BETWEEN CONVENTIONAL AND SOCIAL BILLING RATES IN GABON (TARIFF IN FCFA EXCLUDING TAX)
Figure 1.12

	Conventional rate	Special low rate	Difference (1) – (2)
House connection	120,000	63,129	47%
Meter rental/month	236	236	0 %
Price paid per m^3 of water on Jan. 1st, 2002	266.71 FCFA*	136.08 FCFA*	49 %

** 650 FCFA = 1 Euro*

Morocco: Connecting disadvantaged communities to water, sanitation and electricity

Connection to the public network is fundamental to ensuring that disadvantaged sectors of the community can benefit from quality water and sanitation. Its importance for public health is all too evident. The cost of connection remains nonetheless the main obstacle: a socially preferential water rate only makes sense if it is accompanied by a connection policy encompassing financial support; thereby ensuring that no user is excluded.

Veolia Water has managed the water, sanitation and electricity services of Rabat-Salé, Tangier and Tetouan since 2002 via its subsidiaries Redal and Amendis. Under these delegation contracts, the overseeing of "social connections" is one of the operator's obligations: water and sanitation connections through Amendis (Tangier and Tetouan); water, sanitation and electricity connections through Redal (Rabat-Salé). This commitment on the part of Veolia Water corresponds to one of Morocco's current national priorities; i.e. the restructuring of "informal settlements" that are often the result of migration from rural areas.

The principle is to allow people who otherwise could not meet the cost of a water, sanitation or electricity connection in a single payment (or even over 12 months) to spread payment over several years. This is contingent on authorisation by the city authorities and the fulfilment of certain conditions (concerning income, neighbourhood, type of living quarters etc.).

In general, "social connection" operates on the level of entire neighbourhoods which are not yet connected. This is either on the basis of *extension* (if the neighbourhood is far removed from the public network) or on the basis of *densification* (if the neighbourhood is already close, or partly connected to the public network – connection cost being less since it doesn't incorporate a network-extension contribution). The priority neighbourhoods are identified in conjunction with the Moroccan public authorities (locally elected representatives, the provincial government: *Wilaya*). The successful running of these operations requires:

- **A commitment by, and perfect coordination with, the local authorities.** Without their approval, the political will to restructure certain urban areas and their financial contribution, it would be extremely difficult to operate efficiently. The operator needs the support of the public authorities to begin social connection operations and to successfully oversee them on a daily basis.

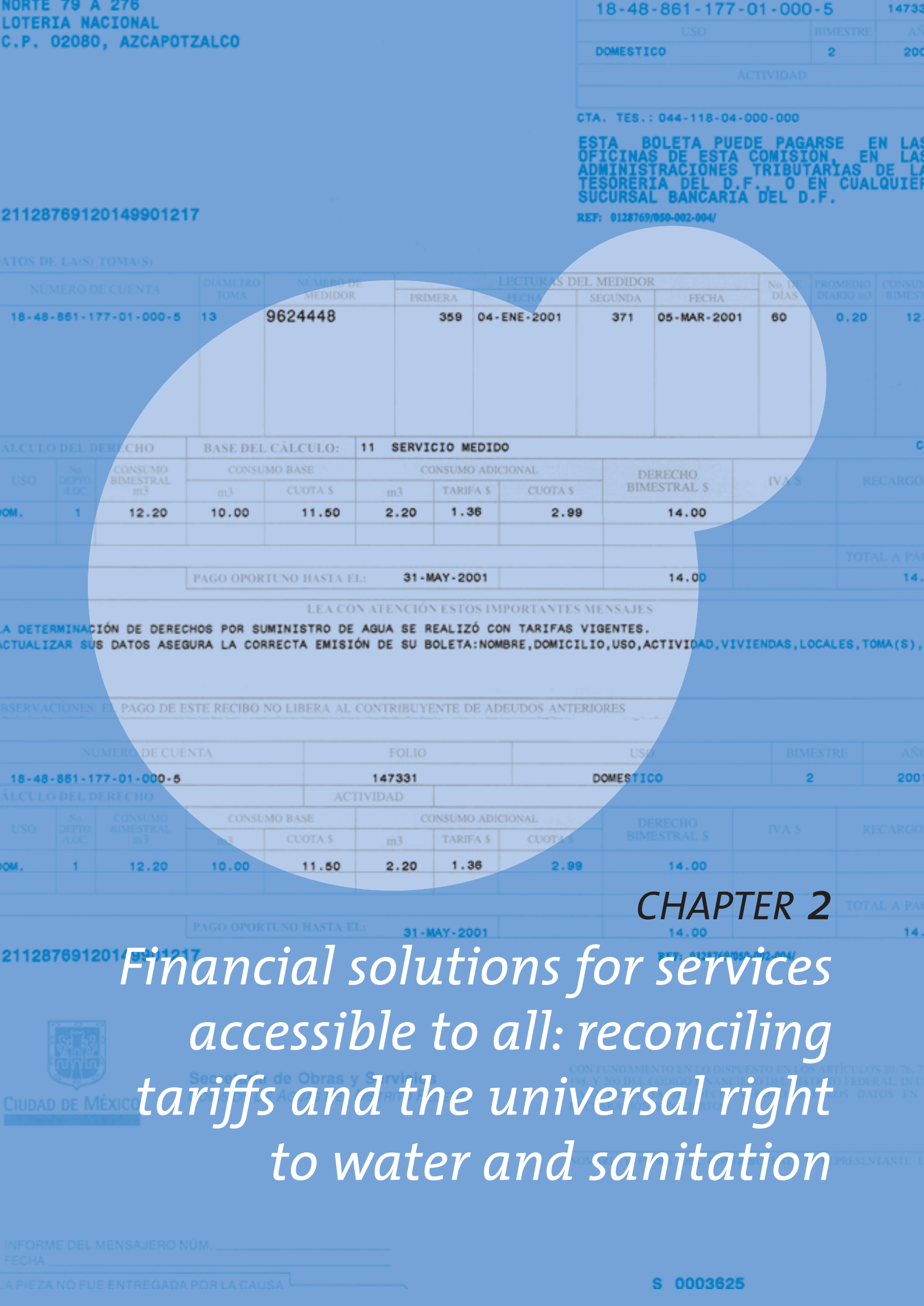
- **Communication and dialogue with the communities** in order to ensure useful consultation with future users and to establish confidence. This is based on solid partnership with neighbourhood and resident associations. Amendis and Redal are thus equipped with mobile agencies which allow inhabitants of the remotest neighbourhoods to carry out basic tasks (information, registration, bill payment etc.) in their vicinity. Some of these are established in converted buses while others are designed specifically.

- **Financial and technical innovation** that is based on partnership with local authorities, the State and other organisms (e.g. social development agencies) and that allows the subvention of part of the connection cost normally paid by the user. The further the user is located from the city-centre, the higher the costs of connection to water and sanitation services will be.

- **A commitment to being responsive:** when an inhabitant makes an administrative demand along with the first monthly payment, it is essential that the connection to the public network is carried out quickly.

- **Rigorous and innovative financial management:**
  Rigorous: A payment of 10,000 MaD (€ 1,000) spread over 5 to 7 years (water and sanitation) carries an element of risk. Automated payment recovery, the use of specialized software and personalised follow-up procedures in the case of a missed payment are essential tools. The regular presence of mobile agencies in the neighbourhood allows dialogue with the inhabitants as well as the anticipation of late payments.
  Innovative: Moroccan law forbids the supply of water to households which are not equipped with a sanitation system. It is, however, sanitation that increases the cost of a double connection (6,000 to 30,000 MaD, € 600 to € 3,000 — more if the target zone is very far from the public network). This situation excludes the majority of inhabitants of outlying areas even if payments are staggered over 7 years. Public subvention (Rabat) or other means of financial assistance (financial institutions, micro-credit) then becomes necessary.

Veolia Water's policy of social connections in Morocco is a concrete example of a professional operator's contribution to improving equal access to essential services. Thousands of Moroccan households have benefited from this in a very real way.
This policy is reinforced by other operations such as a school drop-out reduction programme run in collaboration with UNICEF and the Moroccan government (latrine construction in schools, hygiene awareness, public services awareness).



CHAPTER 2

Financial solutions for services accessible to all: reconciling tariffs and the universal right to water and sanitation

CHAPTER 2
Financial solutions for services accessible to all: reconciling tariffs and the universal right to water and sanitation

If one acknowledges the universal right to water for all humankind, water as a natural resource doesn't have a price. But with uncontrolled urban sprawl, the supply of safe water becomes the focus of economic exploitation by special interests that often penalize the poorest populations. Beyond the official debate concerning the participation of private operators in managing a public service, realities in the field demand concrete financial solutions guaranteeing equal access for all. The three basic financial questions needing answers are as follows:

- How to finance investments for upgrading and extending networks
- How to financially assist the purchase of a house connection for consumers with low incomes
- How to establish fair billing rates for the supply of safe water

2.1 Financing investments
2.2 The connection: a cost too high for consumers alone to pay
2.3 Consumption: tariff models for water supply
2.4 The contributions of micro-financing

2.1 FINANCING INVESTMENTS

Water is essential for life. **Every person has the right to safe water in sufficient quantity every single day of his life, and ideally in his own home**. In expanding urban centres, this fundamental right can only be respected if an equitable distribution service is created. By the right to water is meant the *right to good quality water*, and to continuous supply (or at least predictable supply), and also to the collection and treatment of wastewater. But the installation, maintenance and expansion of a

service of this type represents major costs. When *free water for all* is applied on a large scale, not charging for the service has made it impossible to guarantee quality service. When water management is not sustainable economically, it becomes unsustainable from a technical, social and environmental standpoint as well.

Access to water supply and sanitation in developing cities is indeed a challenge. It first of all raises the question of upgrading and extending networks. These processes are costly but essential if the fundamental principle of equality of access is to be respected. Beyond the problem of *mobilizing the capital needed* from the principal funding agencies, *the financing of investments* demands solutions that are both innovative and adapted to the context of developing countries. For in addition to the economic and commercial risks taken by the operator(s) involved in managing the service, and the need to respect cultural diversity, there are also political and monetary risks, which vary depending on the region. These risks directly affect the price of insurance premiums and the interest rates demanded by funding agencies.

We sometimes forget that it's because funding agencies and professionals who finance projects (whether local, national and/or international) have been mobilized that operators (national or international) can do their job, offering their skills within a stable institutional framework. The pledge of significant amounts of capital over long periods of time carrying risks that can only be poorly controlled or not at all, may generate excessive debt for the players involved. This is likely to threaten the equilibrium and viability of public services. An economic crisis or a sudden devaluation may thus have an extremely destabilizing impact on the public-private partnership as a whole, by suddenly increasing the debt service contracted by some of the partners in foreign currency. This situation may lead to the total or partial disappearance of the investment capacity of the players concerned, or to an unreasonable transfer of the debt to consumers via an increase in billing rates, or in the worst case scenario, to bankruptcy of the system.

On the basis of recent experiences in the delegated management of drinking water supply and sanitation services in developing regions, a few guidelines have been defined that may help find answers to the question of financing investments:

- **SOLUTION 1:** Optimize operation of existing installations
- **SOLUTION 2:** Realistically size and schedule new investments
- **SOLUTION 3:** Share risks the best way possible among all the players
- **SOLUTION 4:** Encourage the use of financial tools that are suited to the context

SOLUTION 1: Optimize operation of existing installations

If better use is made of existing installations, the need for new investments may be reduced or delayed. For the same quantity of water drawn off, more consumers can be supplied and the quality of service improved if the supply and distribution installations are made better use of. By lowering line losses throughout the system, the supply pressure can be increased and the continuity of supply in peripheral settlements improved; the quantities of water saved can then be redirected to areas that are traditionally under-supplied.

The job of the operator is to share his expertise in order to optimize the day-to-day management of the water supply service, for example by increasing the availability of potable water production plants, by lowering line losses or by setting up a system for monitoring results. The impact of such procedures may be considerable on the investments needed to finance system upgrading and extension in the future. They allow for partially resolving the conflict between the budgetary problems of local authorities and their immense investment needs. Improving the quality-cost ratio for system management preserves financial resources that can be used to finance new investments.

Today in France, approximately 15 to 25% of drinking water consumed in an apartment building is lost; the reasons are multiple: leaky valves in toilets and in lines in general service areas, losses in the supply and distribution system. In some megacities in developing countries, such as Cairo or Mexico City, losses in the public distribution networks can be as much as 60% of the water distributed. The maintenance and repair of public networks and domestic installations are thus indispensable if savings are to be made.

● SOLUTION 2: Realistically size and schedule new investments

Investments must be appropriately sized and an optimal programme of works organized to upgrade water supply and sanitation services in developing cities. Whether or not they entrust the management of their water supply and sanitation services to a private partner, local authorities must be precisely aware of the state of repair of their installations, and naturally of the expectations of the various consumer categories concerned. The over-sizing of investment programmes can thus be avoided. In the case of partnerships between the public and private sectors, leasing contracts may be of interest because they allow private professionals to propose their capabilities without having to sign a concession agreement for which the ground conditions have not necessarily been fulfilled. **During the initial years of management, the various partners learn more about consumer needs and about the real state of repair of the installations, on the basis of which investment programmes can be effectively sized.**

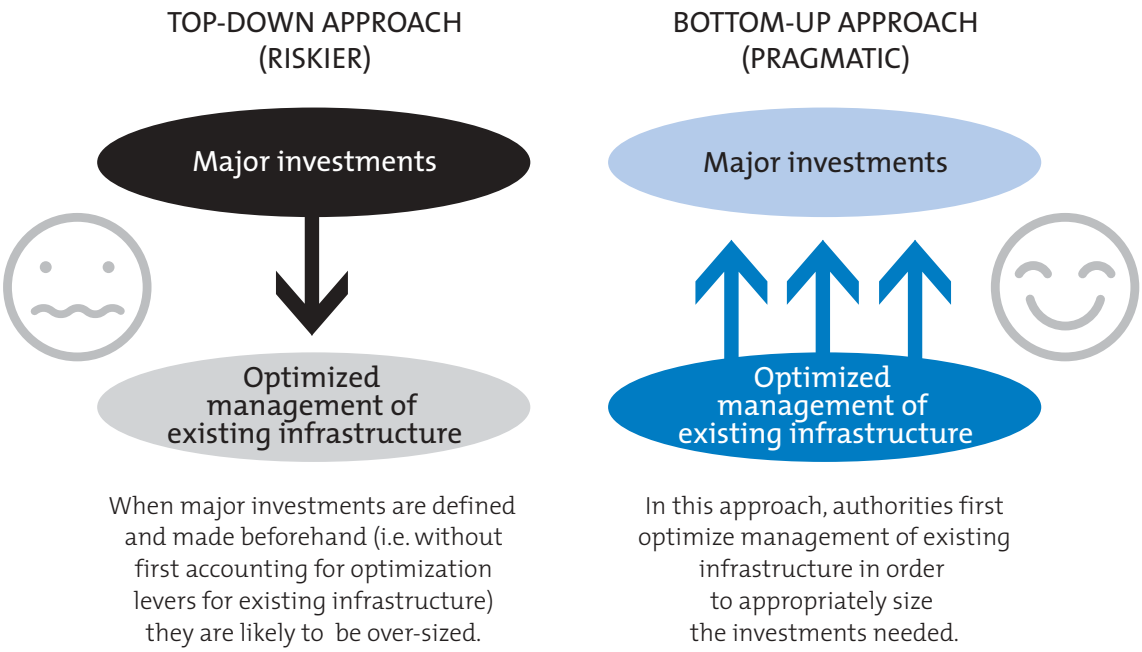
But collecting the data needed to define improvement programmes for water services remains a delicate affair. Estimating the cost of upgrading and extension works is a difficult task because the majority of the installations are below ground and are consequently hard to access. In addition, populations sometimes migrate to urban and semi-urban centres in ways that are hard to predict, creating new temporary settlements.

A thorough grasp of realities in the field is absolutely vital. In order to define obligations to attain realistic results, the validity of data concerning the initial level of service and the expectations of existing and potential consumers must first be checked. Elected officials must make decisions concerning the levels of service to be provided, the financing to be set up, the optimal tariff system, etc.

Encouraging partners to concentrate their efforts on the capital saved and not only on the capital *invested* is a way to optimize the sizing of new investments.

PAY ATTENTION TO INVESTMENT PRIORITIES!

Figure 2.1



SOLUTION 3: Share risks in the best way possible among all the players

Involving new international players, whether private or public, in the management of a water supply and sanitation service is a delicate process. A distinction must be made between funding professionals (banks, investment funds, multilateral organizations) and infrastructure management professionals, i.e. 'operators'. Further thought must be given not only to the optimal breakdown of the risks incurred by all the partners, but also to the way in which *these risks can be insured at the least cost*. High interest rates necessarily reflect the existence of major risks. It is for this reason that the percentage of finance charges in the total cost of water supply services in some developing countries is sharply increasing.

Usually, investment programmes and calls for bids are launched in a relatively tense economic and social context, to which problems tied to historical malfunctions of the service must sometimes be added. Loans are often taken out in foreign currency, whereas the revenues generated by the water supply and sanitation services are in local currency, which is often less stable. The time taken to consult local partners and consumers, a basic step in establishing a consensus as to priorities, is often insufficient and does not allow for determining real expectations.

Risks must thus be divided among the stakeholders according to their specific roles and respective tasks. The operator's job is first of all to use the existing infrastructure as well as possible rather than finance the new investments that are sometimes needed. Working with local investors and international funding agencies, the operator fulfills a particularly influential role during the construction

works that investments have paved the way for. When an operator's job is to upgrade a water supply system, his work guarantees that the financing made available by multilateral organizations and/or public authorities is put to good use. The operator helps the local authority (whose capacities do not always allow him to access financial markets by himself to control infrastructure development) to optimize his investment programme, primarily by attenuating its impact on the price of the service. Even though the mobilization of private funds is naturally more expensive than the mobilization of public funds, a private operator may provide part of the funding within the scope of a concession agreement or a BOT (Build/Operate/Transfer) type contract, and thus play the role of catalyst in attracting other financial partners.

The optimal breakdown of risks in relation to the specific situation of each player may be organized in several different ways: by strengthening the governance structures of States, by developing the independence and capacity to act of local authorities, by expanding the framework of action for operators of water supply and sanitation services, by improving consumer access to basic financial services.

● SOLUTION 4: Encourage the use of suitable financing tools

> *The complementary nature of public and private financing*

Social objectives are more and more frequently attached to institutional loans. Bilateral, community and multilateral development banks (grouped together under the denomination International Financial Institutions – IFIs) help countries with middle to low range incomes to set up strategies for reducing poverty by making loans available at low interest rates. These banks also act in an advisory capacity and contribute to increasing the knowledge and capabilities of governments.

In the past few years, IFIs have attempted to support various sectoral reforms and to mobilize private funding rather than directly finance the investments they themselves recommend. Even though

private investments tend to predominate in the energy, mines and telecommunications sectors, loans granted by IFIs continue to play a major role in the water sector, in particular for financing infrastructure.

Investments in the water sector are of two types: investments in water treatment equipment (having a lifespan rarely exceeding 20 years) and, **investments in civil engineering and public works** (pipelines, connections, etc.), the lifespan of which often exceeds fifty years and for which extensive financing is required. In industrialized countries, investment in major infrastructure has largely been financed by public funds, whereas private funds have been used for water treatment equipment.

The mobilization of public funding may be accompanied by the setting up of a national development fund. IFIs help authorities in the setting up of such funds, which are usually composed of contributions made by all providers of services. These funds are designed to finance the initial infrastructure works of contractors who are willing to work in disadvantaged areas. This type of fund has flourished in the telecommunications sector in Nicaragua and the Dominican Republic, and in the energy sector in Uganda. Funds of this type are scarce in the world of water. In Columbia, a project for sectoral reform proposes helping several average size cities (up to 300,000 inhabitants) and small towns (up to 12,000 inhabitants). Twenty to thirty-year leasing contracts and concession agreements have been signed with operators who demand the lowest subsidies in order to obtain the financing needed for investments, and to operate the water supply and sanitation service.

In many cases, combining public and private financing means lowering costs in comparison to entirely private or entirely public financing, and billing rates can be lowered in consequence.

IFIs encourage innovative solutions which call for a mix of public and private financing. With combined financing, private capital is only available if the political and commercial risk is reasonable. Political risk is usually covered by insurance-credit institutions like COFACE in France, or the Multilateral Investment Guarantee Agency (MIGA). These bodies encourage foreign investment in developing countries by guaranteeing investors against losses tied to non-commercial risks. IFIs can also contribute to covering excessive commercial risks that other players are not willing to insure.

One of the key roles of public financing institutions is to encourage the mobilization of private funds by using its own contributions as leverage. In France, the *Caisse des Dépôts et Consignations* (a public financial institution) estimates that guaranteed public capital can generate as much as seven times its value in private investments.

> *Output-based aid*

Based on the acknowledgement that many aid programmes do not really improve access to services for the most disadvantaged consumers, and in an attempt to be more realistic and also provide financial incentive, the World Bank has developed a new approach, called output-based aid. It consists of entrusting the supply of services to third parties, such as industrials in the private sector or NGOs, through contracts in which the payment of subsidies is effected on the basis of meeting the objectives set, such as the making of a specific number of household connections for water supply.

The output-based aid model is unlike traditional approaches because it is focused on evaluating performances, i.e. on the output achieved in using the aid, and not simply on the aid amount. It demands a very precise definition of the goals to be pursued.

This new approach is designed to promote efficiency and innovation, to improve management of public expenditure and to create a more attractive environment for private investors. It also differs from conventional models for the private management of services in that the revenues paid by consumers are mixed together with the payment of public subsidies, which is conditioned by meeting the goals set in the contract. At the same time that optimal allocation is obtained from public funding, output-based aid serves to increase the mobilization of private funding for some public services which today have ceased to attract investors.

> Why so little private investment in the water sector in developing countries?

The small proportion of private capital invested in upgrading/constructing water supply and sanitation infrastructure in developing countries is the result of economic constraints and the specific characteristics of the local political scene.

- Private investment is based on obtaining a return for the risks incurred by providers of capital and by professional operators responsible for management of the service. But 'country-related risks' (political, monetary, legal, etc.) often combine with industrial risks (acts of God, indexation and revision of billing rates, controlling costs, results, deadlines) and a 'customer risk' (solvability).

- Efficient regulations and balanced competition encourage private initiative. The majority of developing countries are still far from having the legal and regulatory tools that reassure potential investors and clarify their relationship with local authorities.

- Citizen groups perceive water supply and sanitation differently from other public services (electricity, gas, telecommunications). Their representatives do not easily accept the idea that private players (who in addition are international) have the right to take part in the management of this essential service.

Figure 2.2

2.2 THE HOUSE CONNECTION: A MAJOR COST THAT CANNOT BE BORNE BY CONSUMERS ALONE

The cost of connection precedes discussions about full cost recovery, because the sums paid by consumers are usually not enough to cover the hook-up expense. The connection cost and consequently access to public water supply and sanitation itself represents the single most important financial barrier for the most disadvantaged consumers, since low income families rarely have the initial capital needed to pay for connection to the public system.

In developing countries, approximately one of every two inhabitants living in megacities has no house connection. Lowering the price of a cubic meter of water would consequently not serve any purpose. The establishment of **scaled billing rates for consumption** compatible with social realities must be accompanied by the establishment of **scaled connection rates,** if equality of access to services is to be achieved. **Without financial aid for hook-up, low income consumers cannot benefit from measures taken in terms of tariff policy, or obviously from actions implemented to improve the quality of supply. A house connection means technical work in the field, the cost of which remains high, and which is inaccessible for the poorest households.**

In Buenos Aires, Argentina, the concession for water was awarded to the operator whose tariff proposal was the lowest, but only households already connected immediately benefited from the lower rates. However, at the same time, the cost of connection was actually increased to help cover the financing of network extensions into the most disadvantaged districts of the city. As a result the cost of connection has become too high for many disadvantaged households, limiting their access to public supply.

And yet, once connected to the public distribution system, the situation of lowest income families improves, primarily because they possess a water bill allowing them to become officially integrated into the urban community. As Jacques-Emmanuel Rémy of the United Nations Development Progamme observes: *"Water supply represents far more than a simple street operation: it is the granting of a service, and on this basis, of recognition."*

The cost of a house connection varies considerably depending on the country, the technologies employed and the service proposed. In Madagascar, the tariff study carried out by Générale des Eaux in 1996-97 revealed that the cost of a social house connection was the equivalent of more than seven months' salary for a labourer, six months' salary for a skilled worker and five months' salary for a team foreman. Based on a universally-accepted criterion, the cost of a hook-up should not exceed the equivalent of a year's savings. A labourer or skilled worker would be obliged to devote not a years' savings, but half his annual salary to pay for a connection. Because candidates for house connections usually have to pay the total connection cost all at once, the quantitative, qualitative and financial gap between those with hook-ups and those without continues to widen in the absence of a social compensation policy.

If access to quality service is to be broadened, increasing the service rate (or connection rate) must become the priority of public and private partners. Providing access to a house connection, (or at least to a shared connection) for all consumers must progressively replace alternative supply solutions, because such solutions are more costly or more hazardous in terms of hygiene and public health, or both. Public authorities have several solutions to choose from to increase the service rate: they can develop social connection polices, install shared connections (which often fail to work) or encourage the forming of consumer groups to develop their capacity to make savings and achieve financial solidarity on a local basis, employing such techniques as community empowerment and micro-financing (see below).

The development of social connection policies may be accomplished in various ways, but all of them require the setting up of suitable financial solutions such as the creation of government-subsidized loans. These loans may be proposed either by operators or by local authorities on the basis of funds supplied in part by revenues generated by the service, and by aid obtained from international financial institutions. The possibility of paying for a house connection in instalments over a period of time is also a way to help disadvantaged consumers. In the city of Manila in the Philippines, the cost of a house connection (approximately USD 115) may be paid over a maximum period of five years for households with an annual income of less than USD 1,900.

> Funds for financing social house connections

SODECI, a private company in the Ivory Coast responsible for the country's public water supply service within the scope of a 20-year concession agreement (renewed in December 1987), is in charge of drinking water production and distribution in urban centres. The company is answerable to the Ivorian Ministry of Economic Infrastructure. At the incentive of the World Bank, the country's National Hydraulics Fund was transformed into the National Development Fund in 1987. The new fund is managed by SODECI, directly under the control of the Water Authority. The revenues earned through the water tariff structure provide the resources needed for this fund, which is primarily used for extending distribution networks, installing coin-operated standpipes in semi-urban disadvantaged settlements and for renewing and making social house connections. The SONEES company is in charge of a similar set up in Senegal.

Source: L'Eau et la Santé (Water and Health), Paris, GRET/programme Solidarité-Eau, 1994

Figure 2.3

There are also other means of lowering the cost of a house connection paid by consumers. Determining the price to be paid for a connection should be based on in-depth socio-economic surveys geared to measuring the income levels of populations and their capacities to make savings. Quality, inexpensive technologies are to be preferred, and inhabitants to be encouraged to participate in the works. If equipment-purchase orders are grouped for large quantities of supplies (for an entire district for example) the overall cost of network extension projects in disadvantaged areas can be lowered.

2.3 TARIFF MODELS FOR WATER CONSUMPTION

The tariff policy is the essential lever in any procedure aimed at improving access to water supply and sanitation in disadvantaged urban districts. But first the local authority must make choices that 1) ensure the financial equilibrium of the public service 2) finance investments 3) break down charges fairly. Experience has shown that obtaining the total recovery of investment and management costs on the sole basis of billing rates for consumption is often unrealistic. The existence of tariffs does not mean that everyone pays the same price for water; paying for water supply does not in any way exclude the setting up of a social tariff, nor the financing of investments by tax payers and/or international funding organizations.

Socio-economic surveys carried out in disadvantaged urban communities reveal that in the majority of cases, the demand for better service is quite clear, even if improvements mean an increase in the price paid per cubic meter of water. For consumer families, improving the water supply service may take on several different forms: increasing the flow rate at a standpipe, installing low pressure house connections, increasing the number of hours per day during which water is distributed, etc.

To facilitate disadvantaged households access to public water supply, in particular by lowering the portion of household income set aside for this service, organizing authorities possess several subsidy systems, which are basically of three types:

- *Direct subsidies*, in which part of the water bill is paid for directly for households fulfilling specific eligibility criteria;

- *Indirect subsidies*, in which the operator receives public aid allowing him to establish billing rates which are lower than the actual cost of water;

- *Cross subsidies*, in which major consumers finance all or part of the low income category of small consumers.

In the first two types of subsidy, solidarity takes the form of transferring tax revenues to disadvantaged consumers of potable water. In the third type, solidarity is in the form of contributions made by more fortunate consumers, which help pay for the most disadvantaged consumers.

Progressive tariff systems by category of consumption are frequently set up. Relatively easy to implement, such systems allow for reconciling social preoccupations (solidarity among consumers) and environmental worries (more responsible utilization of the water resource). And normally, progressive tariff systems are not very costly for public authorities and the operator. Answers must be found to three principal questions before implementing a system of this type:

- **What is the minimum quantity of water needed by the low income consumer category?**
  The first parameter to be identified is the quantity of water corresponding to basic needs. This quantity varies from country to country: it is 6m³/month in South Africa, 14m³/month in Chad and 25m³/month in Bangalore (India). Based on comparison, it can be assumed that a quantity above 10m³/month would be too high and would not effectively account for small consumers.

- **How should the price of water for the low income category be determined?**
  Water supply for the social category of consumers may be subsidized with revenues received from other consumer categories, with tax revenues, or with aid from international financial institutions. The goal is to reduce the billing rate for the essential needs of the poorest consumers while remaining consistent and maintaining the principle features of the service. *A socially acceptable tariff may be defined as a percentage of income*, and in this case it should be less than approximately 3% of household income.

- **How should fixed expenses be broken down?**
  A poorly defined tariff structure is unfair to both the operator and the consumer. In general, a lump sum covering everything for the first 10 or 15 cubic meters of water consumed penalizes disadvantaged households whose consumption is lower than this figure. High fixed charges make it difficult for small consumers to pay their water bill. Many tariff structures only introduce these charges starting with second payment bracket.

There are several risks involved in setting up a progressive tariff system. Firstly, subsidies granted for the low income category of consumers must not lead to rates that are too high for the other consumer categories. In some large cities, the number of disadvantaged households qualifying for the social category may represent a very large part of the population (up to 30% in some instances), and thus constitutes a sizeable financial burden. In addition, tariff structures of this type may be accompanied by perverse effects that are hard to rectify.

For example, the sharing of a house connection among several households automatically results in an increase in the quantity of water consumed. Sharing consequently cancels the positive effect of a progressive tariff structure. Reselling water in the neighbourhood is also a frequent phenomenon: some customers become suppliers, selling water to their neighbours who are not connected. But they do not sell it at the price they pay for it; instead they index their price on the price per cubic meter paid by consumers in the highest consumption category. In some cases, the rate demanded by resellers, which includes a profit margin, largely exceeds the price paid in the top consumer categories. The number of households not connected to the public supply network consequently increases, even though in the end they pay a very high price for a service they cannot officially benefit from, but which becomes very profitable for others.

In Hô Chi Minh City (Vietnam), the resale of water from a house connection is allowed on condition that the customer-reseller's line is fitted with a meter. In fact, this practice has been progressively legalized. In Jakarta (Indonesia), the resale of water by PAM JAYA customers, although widely practiced, was forbidden until 1990, but has since been legalized. Because no pricing schedule has actually been established, resale prices are determined by the law of supply and demand in the neighbourhood, and are thus based on competition.

In addition to these balancing mechanisms, which in reality constitute tariff equalizations, some tariff systems include a geographic component designed to spread financial solidarity over a larger

area to reach more consumers in need of assistance. However, national or regional equalizations have a hard time accounting for local differences in production and distribution factors in their tariffs, and consequently do not work towards optimal management of the service at the local level.

And lastly, the definition of economic models adapted to the public water supply service also depends on the potential impact of neighbourhood associations (or CBO, Community Based Organizations), and in some cases, on that of NGOs regarding tariff-related questions.

By participating in the definition and implementation of projects, populations come to better understand how a water supply and sanitation service operates and are consequently more willing to accept the tariffs associated with these services. Moreover, if the participation of the community is well–organized, numerous opportunities present themselves for lowering investment and/or management costs, and thus for lowering billing rates. This is discussed in Chapter 3.

COMPARISON OF SUBSIDY SYSTEMS

Figure 2.4

	Direct subsidies	Indirect subsidies	Cross subsidies
Examples	Chile since the reform of 1990 Russia since 2002	Almost all states in which the municipal operator receives national subsidies	Progressive tariff structures by consumer category: South Africa Ivory Coast, Chad
Advantages	• **Transparency:** subsidies are explicit and rates constitute authentic signals expressing the scarcity of the resource • **Possibility of subsidizing new house connections**	• **Lower administrative cost** • May allow for accompanying system extension	• **Easy to set up** • **Efficient tool for managing the resource** (fights against the wasting of water)
Disadvantages	• **High administrative cost** • Problem in **selecting criteria** that effectively target the beneficiaries (income level, geographic criteria, etc.) • In most cases, only consumers benefit from this type of subsidy	• **Opaqueness:** which consumers actually benefit • **The price of water no longer reflects its real value (its cost)**	• No benefits for consumers not connected • Frequently the **middle classes** benefit the most • **The price of water no longer reflects its real value (its cost)**

Community-based organizations and in some cases NGOs can offer their experience in the field along with innovative solutions for determining billing rates.
They can also suggest ways to organize bill payment and recovery adapted to the situation of disadvantaged households because they are in contact with them on a daily basis. These organizations can also set up systems in proximity for meter reading, billing and bill recovery that are not only efficient but also adapted to the needs of the population. And finally, local associations can help inhabitants negotiate rates for services and conditions for payment, helping ease the pressure of a monopoly supply situation.

> When the social rate is high: the limits of social tariffs

Until the beginning of the 1990s, the majority of developing countries organized their public water supply service as a State service in which system management was ensured in its totality by a public operator, and discriminatory tariff regulations were enforced. Positive tariff discrimination was based on financial and social considerations, i.e. it was financial to the extent that the state manager, the service or the public company tried to achieve financial equilibrium of the service provided, and social to the extent that the tariff policy was organized in such a way that the rates charged to major consumers, regarded as rich, covered the social rate (or even free water) granted to small consumers, regarded as poor. The system operated on the principle of cross subsidies and positive discrimination.

The social rate was put into practice as follows: the rates charged for water were broken down into categories based on consumption. The rate applied for the first (lowest) consumption category was far below the actual cost (cost price) of the water produced. The existence of this first category meant that all customers could profit from a minimum volume of potable water. The billing rate for the category situated just above this category more or less corresponded to the cost price of water. The third and final category, reserved for major water consumers, was billed at a higher rate. The tariff structure was thus progressive, with a minimum limit for the quantity of water consumed. While the system was designed to work 'inter-customer' by means of cross subsidies, there was also equalization between customers and non-customers, ensured by public standpipes where water could be obtained free of charge.

This tariff system is an excellent example of how things can go wrong. Consumers did not behave in the manner expected. First of all, the social rate did not encourage consumers to become customers because the cost of a house connection was far beyond reach. Secondly, a new type of consumer, 'the neighbours' came into being.

Non-customers living far from a public standpipe very frequently developed new supply strategies, by soliciting customers who lived next door. The latter became resellers, allowing their neighbours to obtain water from an outside connection against the payment of a fee. Resellers were very happy with their new found business.

By passing on their water bill in totality to their 'customers', resellers could cover the cost of their own consumption, which consequently was absolutely free. Resellers simply adopted the marginal cost principle, which consisted of demanding a price that was not the average of the rates for the three consumer categories, but the highest rate. The resellers (presumably rich) added a profit margin to the service they were providing in order to pass the cost of their own consumption on to their customers (presumably poor). Their enthusiasm for this newly discovered job pushed them even farther, to the point where the resale price was far higher than the public rate for the highest category of consumer; the resale of water thus became a profitable business.

Source: GRET, programme Solidarité-Eau

Figure 2.5

2.4 MICRO-FINANCING

In contrast to certain preconceived ideas, savings can be mobilized in disadvantaged urban areas, however modest they may be. The capacities of poor families to save seriously limit their investments. How can a situation of insolvability be overcome to allow these families access to a house connection on the public supply line? How can local investment capacities in community facilities be developed? A number of schemes in the micro-finance sector have already been successfully tested. However, such schemes must be adapted to the specific context of access to water supply and sanitation in developing countries if they are to be employed effectively in this field.

Micro-financing mechanisms may be used to obtain a loan, to safely place one's savings, add to them and then make use of them with a minimum of formalities. For instance they can be used to help disadvantaged families invest in private and/or public facilities. Micro-financing schemes differ depending on how their decision-making and control structures are organized, on the type of security demanded and on the financial techniques employed. But whatever their specific characteristics, they do not resemble conventional banking procedures.

Conventional banks will not do business with certain segments of the population because of the risk involved. The procedures associated with micro-financing schemes respond to three vital concerns: *proximity, simplification* and *supervision/regulation*; they set aside the conventional guarantees demanded by commercial banks (goods or collateral to back a loan), which many households are not in a position to provide. The primary motivations for these loans are the development of some sort of economic activity, access to healthcare, home improvement, the organization of marriages or religious festivities, the purchase of supplies, etc. **Micro-financing refers to a concept of development characterized by short credit circuits, by re-injection of the savings made into micro-projects and by maximizing the use of savings at the local level.**

Some of these schemes can be used to encourage local investment (even on a very small scale) in water supply and sanitation services: tontines, credit cooperatives, mutual guarantee loans, individual loans with guarantee, mobile banks, village banks, etc., the features of which are as follows:

- **Mutual guarantee loan**
  Borrowers are organized into small groups of around five to twenty members; together, the members are collectively responsible for loans taken out individually. The mutual guarantee loan allows the most underprivileged to obtain credit, even if they cannot individually provide the necessary security. Trust is a key element of this mechanism, which is based on the solidarity of the borrowers. In some disadvantaged settlements, mutual guarantee groups are organized in order to build latrines or to improve roads (primarily to lower the impact of flooding).

- **Micro-loans made available by specialist organizations**
  Thorough familiarity with the context is essential for partners involved in this type of project. They must be very well informed about the needs and main features of the way of life of the households target. Selecting a local correspondent is necessary both before granting the loan, in order to assess the social feasibility of the project (to estimate the level and regularity of incomes, the level of debt of individuals, etc.), and afterwards, to ensure the loans are effectively distributed and monitored.

- **Tontines**
  The subscribers in a tontine pay into their common fund on a pre-established date and take turns using the total amount of the contributions made over a given period of time. The parameters for this mechanism, such as the contribution amount, the frequency of contributions, the maximum number of subscribers and the way in which the fund is to be shared (turns defined in advance, turns established by drawing straws, etc.) vary with each tontine. This scheme is very flexible and can be adapted to various socio-economic contexts (average income level, social relations among the subscribers, etc.).

> Some background data on micro-financing

- Micro-financing began in the early 1980s in Bangladesh and Bolivia, primarily to help poor women living in rural areas develop activities to earn money and consequently improve the quality of life for their families (health, school attendance, etc.)

- There are currently some 10,000 of these institutions, which mostly consist of small neighbourhood organizations (village cooperatives, NGO programmes, etc.), and whose activities concern nearly 20 million persons worldwide.

- Micro-financing operations cover loans and savings and even insurance, but the underlying principle is granting short term loans to micro-businesses or to persons with low incomes. The goal is to help them start new activities that bring in revenue.

- Micro-financing ensures financing services that are normally not covered by conventional financial institutions. Its main clients are micro-businessmen in rural areas.

  In order to gain a wider sphere of influence, micro-financing will have to become more professional and find a way to refinance itself.

Source : Association PlaNetFinance (www.planetfinance.org)

Figure 2.6

Operators of water supply and sanitation systems usually cannot be directly involved in such schemes because they have no control over them. However they can set up partnerships with the subscribers or the managers of tontines or mutual guarantee loans in order to channel, for example, part of the savings to finance new connections to essential services networks. This is a real incentive for development because it makes water supply and sanitation more accessible in the regions that need it most.

Micro-financing schemes therefore play an important role in freeing resources for building the economy of low income populations. Loan repayment instalments are close together because it is easier for persons with low revenues to reimburse small sums each week rather than large sums once a month. **The key to the success of micro-financing mechanisms is extremely tight management backed by careful monitoring and the continuous supervision of borrowers.**

Unlike grants, which do not necessarily motivate the recipients, micro-financed loans create a rotating fund paid into by the repayment instalments, which other families can then benefit from. Whereas grants do not provide incentive to maintain existing infrastructure, poor urban communities that partially finance the investments they are to benefit from develop a sense of ownership regarding the new or upgraded installations. This attitude ensures diligence in carrying out the work itself as well as in performing the maintenance work needed later on.

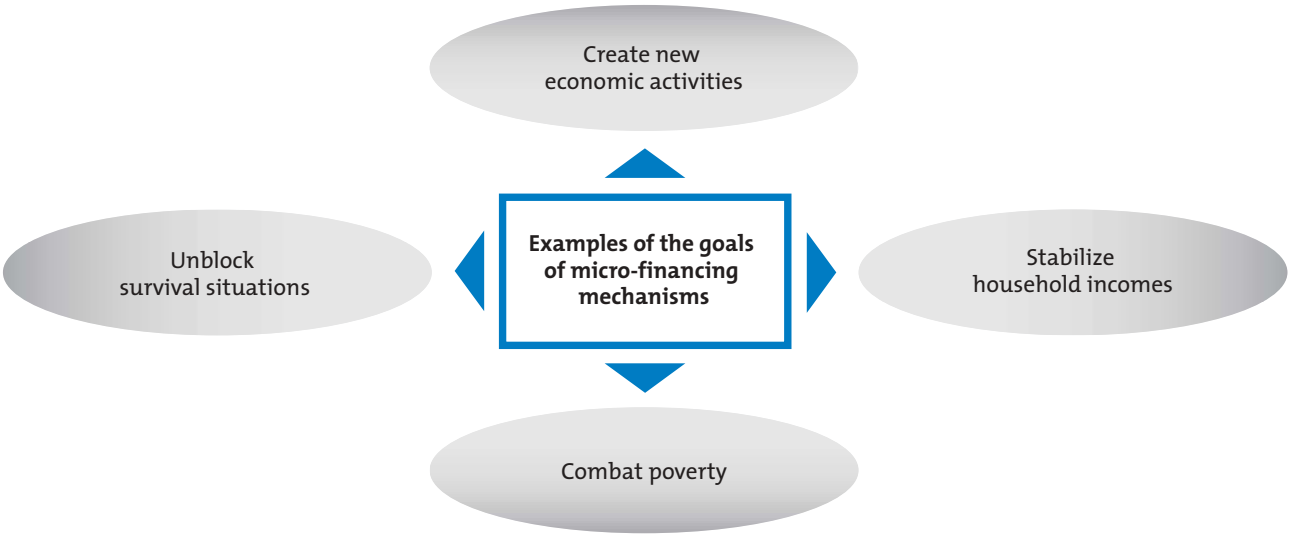


Figure 2.7

Micro-financing interest rates are usually around 3 to 5% per month. This might seem high but it is an essential condition for ensuring the sustainability of funds. All the costs of the lending body must be covered (capital costs, inflation, the risk of non-repayment, logistic expenses for monitoring the loan, data processing and management, training and remuneration of supervising staff). When the local credit agent cannot be paid satisfactorily, the monitoring process (which is essential) suffers.

In any event, interest rates of 3 to 5% per month are low compared to rates applied with other types of loans offered to disadvantaged persons. Because of the scarcity of money in impoverished settlements and the high risk of non-repayment, some private lenders demand exorbitant rates of from 5 to 10% per week, and sometimes even more (up to over 100% per month).

COMPARISON OF PRINCIPAL FINANCING SYSTEMS

Figure 2.8

	Micro-financing		Moneylenders in disadvantaged settlements	Commercial banks
	Mutual guarantee loan	Individual loan with guarantee (for micro-businesses)		
Interest rates	3 to 5% per month	3 to 5% per month	30 to 100% per month	Less than 3% per month
Loan period	Usually 3 to 12	Between 6 months and 2 years	A few weeks	Usually from several months to 2 years
Amount	$30 to $50, as much as $150	$300 to $1000	Usually $10 to $50	Highly variable
Guarantee/Security	• Mutual guarantee of savings-loan group • Blocking savings	Individual guarantee or based on the assets of the micro-business	Pressure of the moneylender	Backed by personal goods or collateral

Responding to the following four questions may help decision-makers to appropriately size micro-financing systems:

- **Who provides the initial capital?**
  This may be international funding agencies, local authorities, an operator or system beneficiaries who progressively make savings. In the latter case, a long period is needed before the fund is of sufficient size to back major loans. But aside from their starting capital, such funds usually need technical and organizational support, primarily and most importantly for training managers and treasurers.

- **How should the loan amounts authorized be determined?**
  The amount depends, of course, on the repayment capacity of the borrowers, which is sometimes hard to evaluate with precision. A current practice for determining the optimal loan amount consists in employing a multiplier of a given person's savings: a borrower could, for instance, ask for a loan equal to 3 to 4 times the sum he has already been able to save. But beyond a certain threshold, the solidarity of several persons for backing a loan is not possible. In this case an individual loan is set up with a guarantee. Mutual guarantee loans may be as much as USD 30 to USD 50, and may even exceed USD 100 in some cases.

- **Should 'productive' loans be separated from 'unproductive' loans?**
  In other words, should a distinction be made between an approach that is economically sound and one that is purely social? At district level, a wide range of activities qualifying for savings and loan schemes (the construction of latrines, water supply, electrical supply, professional training, etc.) help channel local financial resources and consequently create a real development dynamic.

The fact that these activities are complementary may make it easier to set up new micro-credit groups and consequently increase the number of beneficiaries. This observation allows for a clearer understanding of the interest of integrated approaches not limited to water supply or sanitation, approaches in which infrastructure improvement is combined with the backing of productive investment (loans designed to improve income, training, etc.).

- **Should such a fund become permanent?**
  Funds may be set up to respond to specific needs. In this case they do not need to be continued once they have served their purpose; this may be the case for a fund that has been created to accompany a house connection policy for water supply for example, or a latrine construction policy. Once the objective has been attained, such funds could be reoriented towards other goals and/or other areas of the city if required, but this often poses several problems (incorporation of a new profile of beneficiaries, how to utilize any leftover savings of the initial mutual guarantee group, etc.).

And lastly, micro-financing schemes sometimes encounter problems:

- **Unpaid loan repayment instalments or late payments,** which continually threaten the economic equilibrium of the system.

- **Organization, decision and supervision problems,** which may arise in a variety of ways, depending on group size and legal status. Problems occur when a structure is composed of several income levels and regroups several hundred members who must together learn the art of delegating – running the risk of breaking up the group into those who are initiated in the process and those who are not.

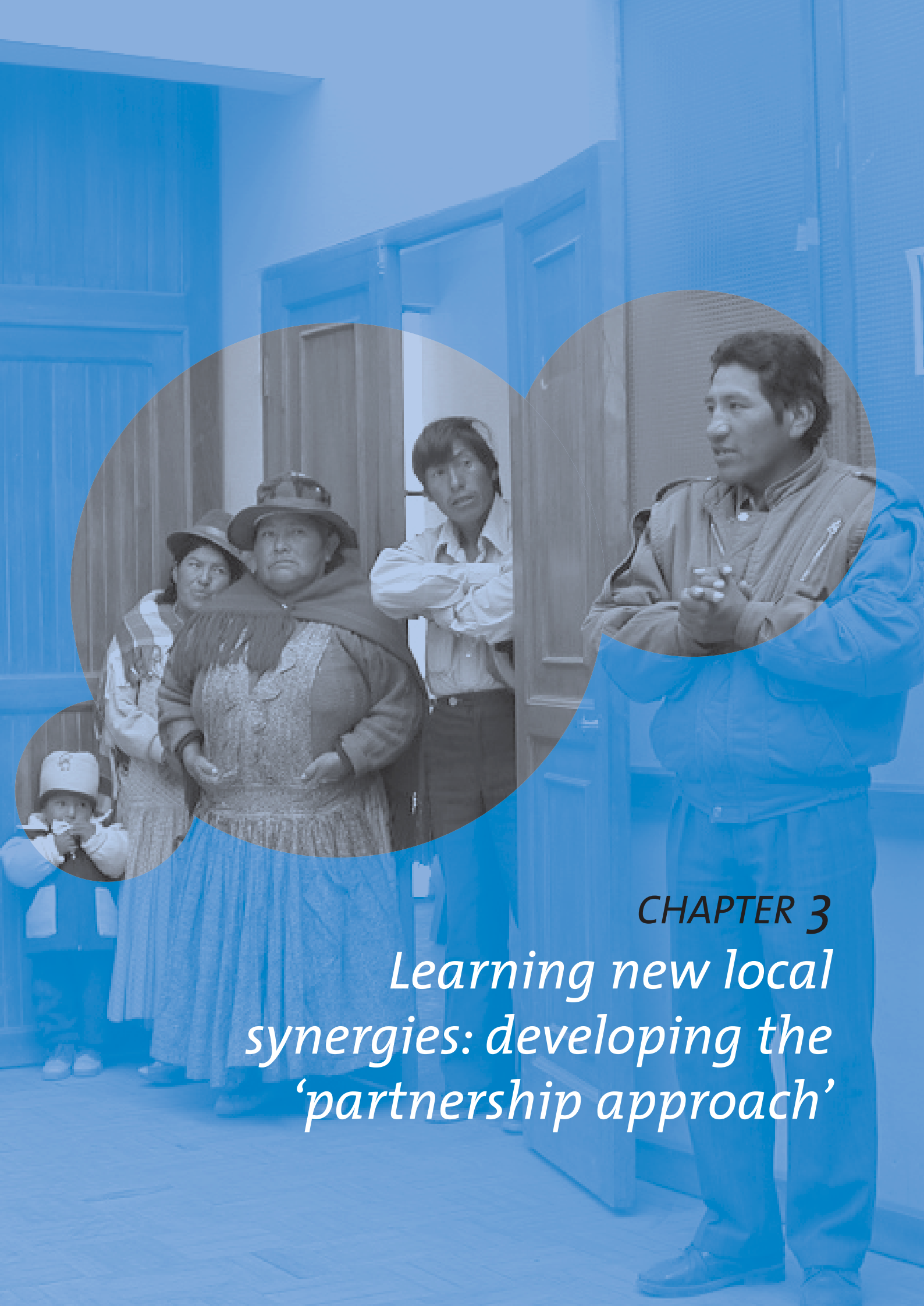
- **The absence of a legal framework for action:** in some countries, for example in Vietnam, no legal framework has been set up for the micro-financing sector and the actions of NGOs. This makes it hard to give such structures the professional standing they need, and constitutes a key challenge in moving towards a complete range of modern financial products adapted to needs.

- **Highly varying loan conditions:** the success of some funds can be partially explained by their utilization of highly diversified ways of operating and by their desire to let the beneficiaries freely organize the mutual guarantee groups themselves. And yet, too much organizational freedom complicates the monitoring of loan repayment, fund management, consolidation of the financial results, and consequently effective control over the lending mechanism itself.

Micro-financing undeniably offers promising solutions to a number of challenges represented by the financing of small local investments. Households benefiting from micro-financing develop new management capabilities, learn how to save regularly and also adjust some of their consumption habits.

Over the long run, populations involved in micro-financing learn how to plan ahead, and their vision of the future changes. The independent status of micro-financing organizations must be maintained to ensure that the decision-making powers remain with local players. The setting up of micro-financing schemes will of course never replace the implementation of major investment plans over the long term, and in particular policies designed to transfer capabilities and knowledge.

Allowing disadvantaged populations to obtain loans and other basic financial services is a social and economic endeavour that largely surpasses a simple financial mechanism. The development of micro-financing is not an end in itself, but it is one means of promoting a fair and humanistic approach to local development strategies.



CHAPTER 3
Learning new local synergies: developing the 'partnership approach'

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Learning new local synergies: developing the 'partnership approach'

The delegated management agreements referred to in the preceding chapter define a general framework binding one or several operators to public authorities over a long period of time. But the day-to-day operation of water supply and sanitation services in the cities of developing countries also involves the smaller scale actions of many other players (alternative suppliers, NGOs, consumer associations, communities, etc.).

Experience in the field has demonstrated that learning how to work together is an essential factor for success. Institutional players must be provided with partners who are thoroughly familiar with the local context and who communicate effectively with all community members. All possible synergies and complementarities must be developed to ensure that the services provided are as close as possible to consumers and their needs. However, the practical organization of local partnerships is not easy to establish.

3.1 A new urban governance
3.2 The dynamics of sectoral reforms
3.3 Accompanying community participation
3.4 The experience of tripartite partnerships

3.1 A NEW URBAN GOVERNANCE

Confronted with the emergency situations observed in many developing countries, all players who can efficiently contribute to the widening of sustained access to safe water in sufficient quantity must be involved in major water supply and sanitation management schemes.

The solution will not come from a single category of players. Northern states are behind in their commitments to aid development. International professional operators only contribute to around 5% of the water services market, while municipalities are overwhelmed with innumerable problems related to the extremely rapid growth of their populations.

If a solution is to be found, everyone concerned must be mobilized: local authorities, public authorities, private operators, international financial institutions, Non-Governmental Organizations, and of course the inhabitants themselves. The most effective solutions are at once technological, financial and organizational and are based on the respect of local customs. Such solutions concern all stages of the water cycle.

To implement realistic public service policies accounting for local customs and cultural traditions as well as for the material needs of all consumers (including the poorest), public and private players and those belonging to the humanitarian circuit for international solidarity must find new ways to work together. Some communities have become involved in sharing responsibilities with other players in the public, private and even informal sectors. These new partnerships are designed to bring together all players in the world of water, whether they are newcomers or more traditional actors whose independence of action has increased.

But officially establishing multi-player partnerships in the field remains a delicate task even though in so doing the connection rate is significantly improved as a result of system extension.
The main problem is defining and negotiating the quality and cost categories to be set up for water services with both operators and consumers and also ensuring the transparency of competition among various suppliers. In such processes, stakeholders whose size and legality vary widely must work together to find a solution. It is sometimes hard for municipal services and the private operator to find a way to effectively communicate and co-operate with other stakeholders at the local level. Non-governmental organizations, which often work in a very direct way with populations, are very helpful in overcoming this problem.

Traditional partnerships between the public and private sectors become more flexible when they cooperate with and are extended by other partnerships, making it easier for the operator to work locally with citizens' representatives (neighbourhood associations, community leaders), NGOs and with local water distributors and resellers – including those who work in the informal sector, such as water carriers, cooperatives, etc. One of the main challenges of these new partnerships is how to progressively incorporate, when necessary, non-institutional suppliers into the partnership by reinforcing the link between the formal and informal sectors based on complementarities that already exist (technical support, relations with the inhabitants, etc.). As a result of both the work of private operators specialized in water management services and the increased involvement of inhabitants (particularly in disadvantaged districts), new types of governance are coming into being in the world of water. Where they have been set up, the partnerships associated with these new forms of governance help move towards the fully responsible and sustainable management of water in major cities. Such partnerships encourage communication and collaboration among the many different stakeholders in the water sector and consequently promote the consultation and involvement of populations at all levels.

In the past twenty years or so some communities have witnessed changes in their role as organizer of urban services. From simply being the operators of these services, municipalities have been given *delegating powers*, while conserving their responsibility as a public service. Their function has been refocused on representing consumers and also on establishing policies for land use and urban services covering a broader scope (economic development, the incorporation of profit margins, the lowering of inequalities, improvement of the standard of living, etc.). These municipalities actively consult all the players concerned by the future of the city (businesses, consumer communities, unions,...).

One of their essential tasks is to set up and implement a framework strengthening the participation of communities in decision-making processes. In this regard all levels of representation must be identified, including specific ancestral forms that continue to structure the society. In Bolivia, for instance, some territorial divisions going back to the Pre-Columbian era remain in force for the inhabitants of La Paz. In the shut-in world of urban poverty, many aspects of daily life are interdependent: income level and stability, hygiene and health practices, the accessibility of essential public services, safety, community organization, etc. The culture, living conditions and interests of inhabitants may be very different from those whose job it is to supply them with good quality water and sanitation services (operators and public authorities). Room must be made for discussion and mediation.

New urban governance structures must involve all players in the local water economy, including the inhabitants themselves, providing for discussion and planning in order to bridge the gap between worlds that are still too often unaware of one another's existence. An initial consultation should prove sufficient for discovering the real aspirations of communities, but it should be accompanied by and structured according to feasible technical choices and modes of supply, concerning which the operator is the competent player. Discussion provides the means for consumers to express their wishes. But the community may not be of one voice or may be unrealistic in assessing its own capabilities; the end decision, however, must be based on reasonable choices.

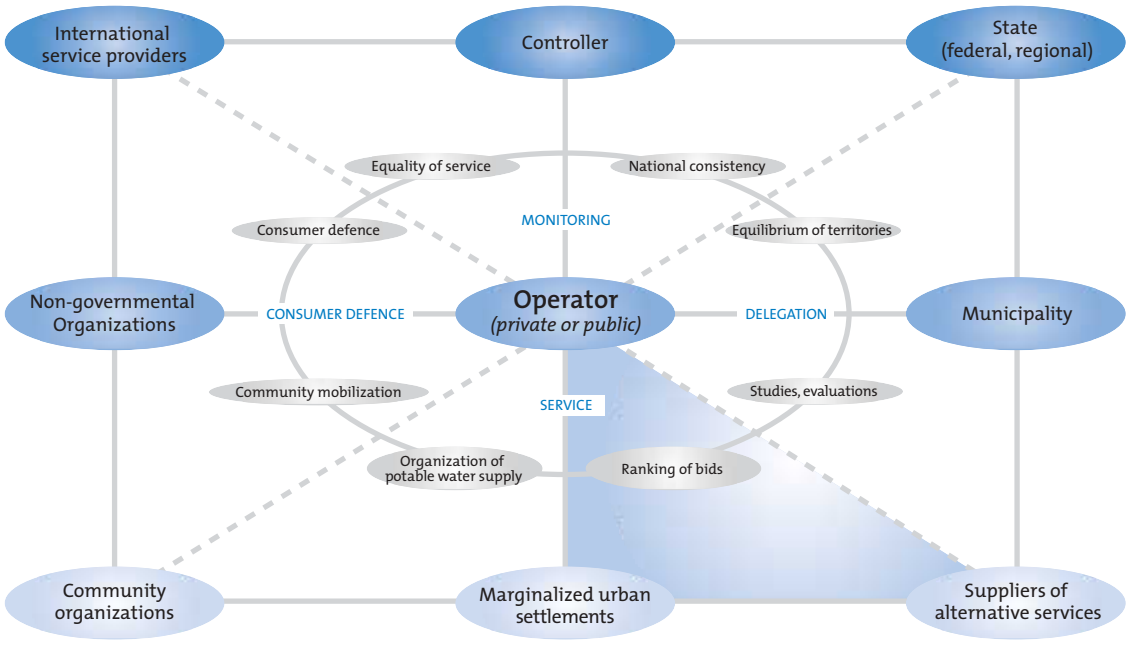
> Partnerships for a new urban governance

In the provision of a public service, in the consistency of a national or federal policy, in identifying financial imperatives, and in ensuring solidarity with and meeting the demands of the poorest consumers, the roles of the respective players are neither clear nor identical from one country to another. **In order to define the roles and interests of the various stakeholders in the water sector, identify the principal conflicting points of view among them and also identify potential supports, the division of responsibilities among the players must be thoroughly understood.**

To identify the players in the water sector, the association *AQUA tu penses?*, set up by students of the ESSEC Business School and sponsored by Veolia Water, organized an eight-month field trip to ten large urban complexes (Rio de Janeiro, Curitiba, La Paz, Mexico City, Aguascalientes, Manila, Bangalore, Calcutta, Durban, Pietermaritzburg). At the end of the period, the association had identified nine interactive categories of players in a single matrix.

At community level, the community being responsible for participating in management of the water supply service (relation of *delegation*), the operator must supply consumers who are practically inaccessible because they live in marginalized urban settlements (relation of *service*). The NGOs present in the field (within the scope of local development programmes) and thus known by the municipality, may possibly be of great help to the operator (relation of *cooperation*). This is a tri-sectoral partnership, the principle of which is also promoted by the BPD programme (*Business Partners for Development*), initiated by the World Bank.

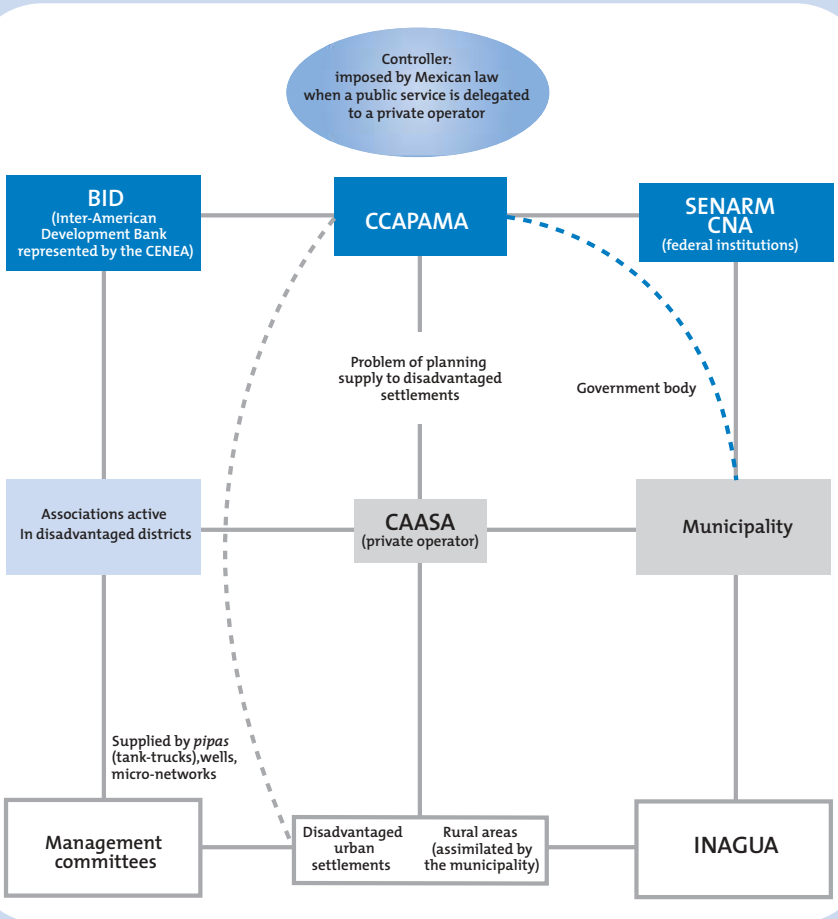
At a more general level, and in the case of delegated management involving the participation of a private operator, the latter must deal with both the political influence of the State (regional or federal) and the institutional influence of *international providers* (financial aid institutions, development banks, for instance). The task of the controller, usually performed by an independent agency, is to check the equilibrium of the relationship between the operator and the municipality, and to ensure that the contractual commitments made concerning supply to disadvantaged settlements are respected (relation of *monitoring*).



In a triangular set-up (one operator and two other players) eight different tasks of the operator can be identified, each of which can be linked to targeted partnerships with the other eight players involved (directly or indirectly) in management of the water supply service, and to the partnership with marginalized urban settlements in particular..

The case of Aguascalientes, in Mexico

Located 450 km north of Mexico City, Aguascalientes, an old thermal resort city, is currently undergoing major demographic and economic expansion (average growth rate of 4% per year). Today the city is home to a little over 800,000 inhabitants, 148,000 of which are customers of the public water supply service. The living standard in Aquascalientes is higher than the Mexican average. The city's water resources consist of an over-exploited aquifer with boreholes drilled ever deeper into it (174 boreholes throughout the urban complex at depths ranging from 300 to 600 meters). Management of the water supply service (production, sterilization, storage, distribution and sales) has been entrusted in its entirety to a professional operator (Veolia Water) through of a 30-year concession agreement (commenced in October 1993). A decentralized body is in charge of monitoring services to ensure that the contractual commitments of both parties, private operator and public authorities alike, are respected; this body also represents the municipality in its relations with the concessionaire. There are five tariff categories, updated on a monthly basis, three of which are assigned to domestic consumers in relation to their socio-economic situation and two to commercial and industrial activities. In addition, a Social Aid Fund *(Fondo de Apoyo Social)* has been created to help the most disadvantaged families who cannot pay for the water they consume, even at the minimum rate.



Source: "AQUA tu penses?" Association (2000)

Figure 3.1

3.2 THE DYNAMICS OF SECTORAL REFORMS

The decentralization policies implemented in many developing countries, although often still far from perfect, have contributed to bringing decision-makers and inhabitants closer together by encouraging the increased participation of the population, improving the visibility of the service for both citizens and consumers.

A community service by excellence, water supply is a core part of these major reforms. As States are progressively recognizing the insufficiency of uniform and centralized solutions at a national level, local authorities are becoming aware of the severe limitations of solutions designed for an urban area covering too much territory and in full expansion. At the end of the 1990s, in Burkina Faso and in Mali for instance, the professional management and maintenance of water distribution and sanitation systems became a necessity. Government administrations consequently decided to reform sectoral policy while decentralization laws were being passed to transfer ownership of drinking water supply systems from the State to local authorities. The new directions taken were based on the "cascading delegation" of various functions (production, distribution, maintenance of facilities, specialist consultation, etc.) to consumer associations, national and even international large-scale private operators, small private operators in the informal sector and local authorities.

In both these countries partnerships were set up to put the changes programmed into action, partnerships, as Denis de Rougemont, one of the world's major federalizing voices puts it, of "variable configuration":

- In Burkina Faso, maintenance services for potable water supply systems in rural and semi-urban areas were reformed to transfer responsibilities to private operators. The operators, approved by the State's technical departments and selected through a call for bids, were entrusted with concession areas (normally two or three provinces) corresponding to a number of facilities sufficiently large so as to make equalization possible among the various centres.

- In Mali, the national strategy has been based on the capabilities of consumer associations developed in recent years; the latter have also joined together to form associations of operators in order to demand the payment of water bills from decentralized State departments. In the past, consumer associations signed agreements with public authorities for the delegated management of their water supply service. Within the scope of the new decentralization laws, this delegation agreement will now be signed with local authorities.

In keeping with this type of sectoral reform undertaken by public authorities in many developing countries, the opening up of possibilities and the forming of extended partnerships are of major interest for disadvantaged semi-urban settlements. Thus, the specialization of players and across-the-board acceptance of the transfer of ownership – including at a very local level – produces solutions that are well-suited to the needs of consumers.

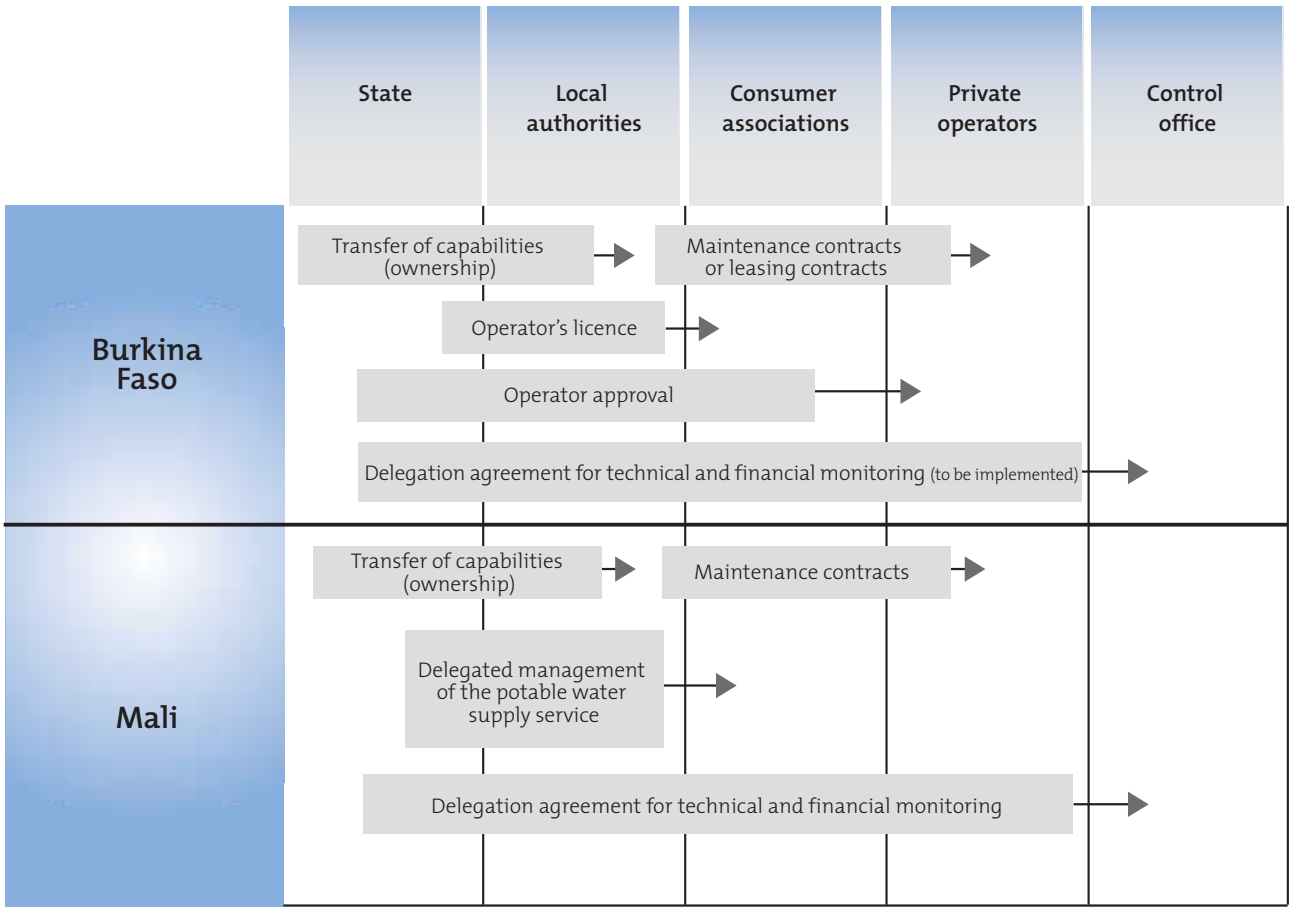
The setting up of official partnerships in the field constitutes a first step in improving the supply of services in general. It is well within the interest of local authorities to enlist informal citizen dynamics by signing delegation agreements with associations or consumer groups – for example to construct and manage latrines and septic tanks, as is the case in India. The quality of the service and its cost must be defined and negotiated with both operators and consumers, and competition

among various suppliers organized so as to ensure transparency. **Turning to local subcontractors often allows for improving neighbourhood services because third parties, who are close to consumers, then become responsible for their actions; this partially lowers management costs at the same time.**

Organizing authorities must clearly define the way in which the roles and areas of action are to be shared out among the various categories of players involved in water distribution citywide. To be effective, this procedure should allow for creating links between large scale urban planning expressed in the form of Master Plans and investment programmes prepared by official technical departments, and small scale planning undertaken by a community and its leaders at district level. But the success of any such link depends on the real determination to co-ordinate the work of these two levels of action, and of course on the existence of the means for doing so, without forgetting the existence of community representatives who have the power to speak in the name of the inhabitants and/or informal operators of the district in question.

THE DYNAMICS OF SECTORAL REFORMS IN BURKINA FASO AND IN MALI: ADVANCING TOWARDS PROFESSIONAL MANAGEMENT AND MAINTENANCE OF WATER SUPPLY AND SANITATION SYSTEMS

Figure 3.2



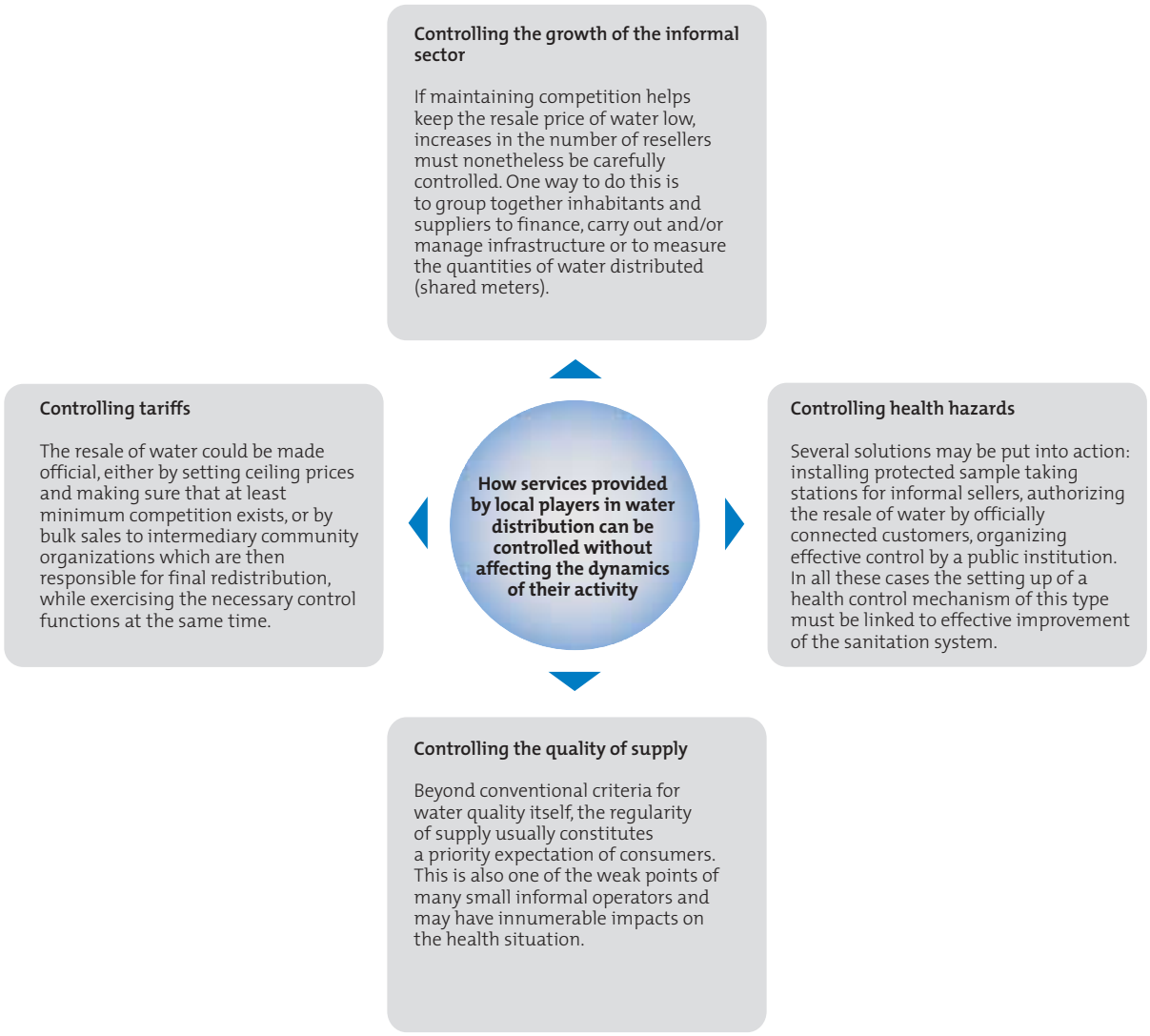
Depending on the regional cultural contexts and the sectoral policy choices made by public authorities, relations between formal and informal players in the water economy are in fact highly varied. Managing the gap between a 'mega' project opening the water sector to a foreign private operator, and the existence of micro-monopolies and micro projects, primarily in disadvantaged districts, may be quite complex at citywide level.

The players involved in informal service are usually treated in a marginal way or are simply tolerated. They often have no legal status whatsoever in the eyes of the administration or local authorities even though they sometimes contribute very concretely (even if in a disorganized fashion) to supplying water to the inhabitants of entire districts. But it is nonetheless often very difficult to grasp the ties among the various players represented. The transfer of responsibilities creates new relations of interest, linked primarily to the goals and constraints of each party. Only a clear definition of roles, backed by an authentically balanced representation of the various sectors involved (public, private, citizen groups), will lead to partnerships that function effectively.

Obtaining the best possible compromise for establishing an optimal public service offer means incorporating small local players into the process in a controlled way, one which does not affect the dynamics of their activity or their flexibility. The participation of these players may be controlled in one of four principal ways:

CONTROLLING THE SERVICES PROVIDED BY LOCAL PLAYERS IN WATER DISTRIBUTION WITHOUT AFFECTING THE DYNAMICS OF THEIR ACTIVITY

Figure 3.3



3.3 ACCOMPANYING COMMUNITY PARTICIPATION

In major developing cities, urban sprawl is largely uncontrolled by public authorities. For the vast majority, informal dwellings built in disadvantaged settlements occupy without any authorization land that has not been subject to regulation (no official property deeds). Because of the precariousness and non-recognition of this situation, it is often extremely difficult for inhabitants to appropriate their living space and even more so the infrastructure they themselves might possibly install. And yet, the findings of research conducted since the beginning of the 1990s by associations and the principal international aid institutions (United Nations Development Programme, World Bank, etc.)

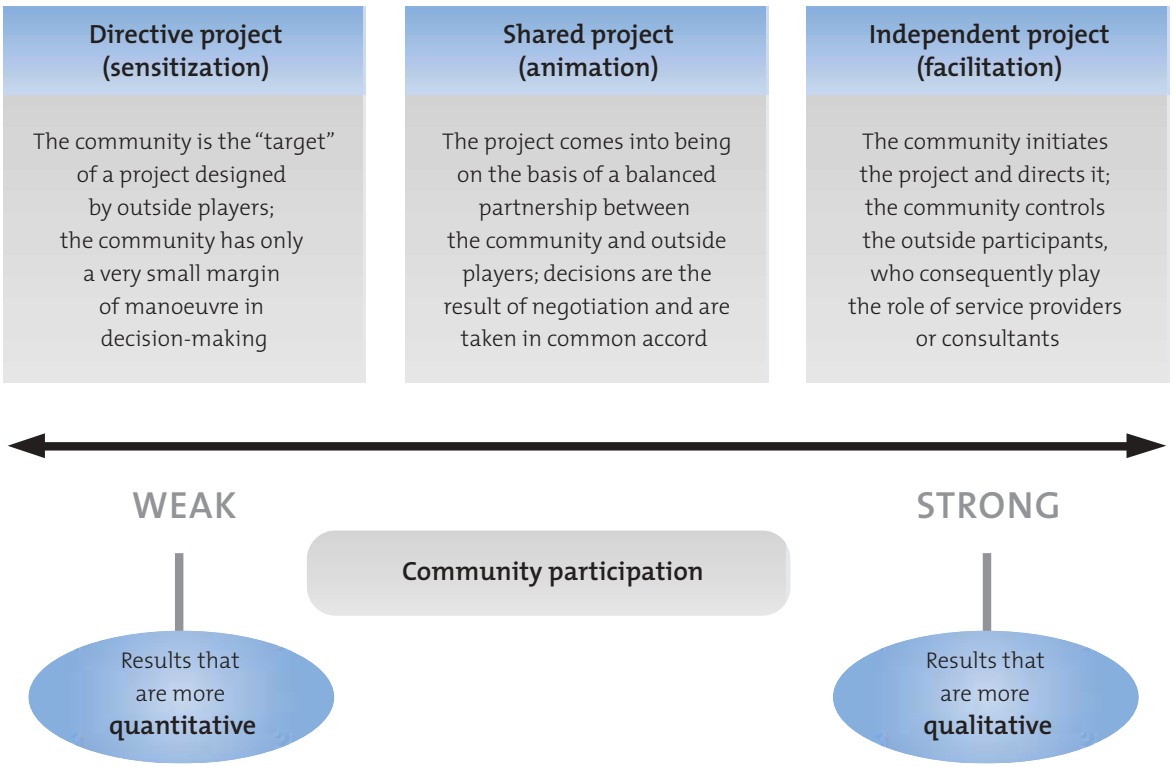
come to the same conclusion. All acknowledge the determination of inhabitants, low-income families included, to participate financially and technically in improving their water supply service.

Encouraging the active participation of communities allows inhabitants to progressively accept the various implications of a new water supply project on their day-to-day lives: modification of consumption habits, transformation of the standard of living, and improvement of the status of women, who may consequently demonstrate their capabilities publicly and sometimes even upset traditional hierarchical relationships.

The appropriation of a project by the community target is indispensable to ensuring that the infrastructure is properly used and effectively maintained. Community participation – whether in the decision-making process, in making a financial contribution or in providing workers – is the principal key for project appropriation. The direct contribution of labourers – for instance to dig the trenches in which the pipelines of the new network are to be laid – allows for lowering the overall cost of the project by limiting the investments needed, and the management expenses generated in consequence. Inhabitants must therefore be trained to work on the infrastructure installation project and to ensure future maintenance if the sustainability of the project is to be guaranteed.

THE VARIOUS LEVELS OF COMMUNITY PARTICIPATION

Figure 3.4



From a directive project – in which the inhabitants of a district must comply with a programme developed elsewhere and also with what is expected of them – to an independent project set up at the initiative of the community and controlled by its inhabitants, the concept of 'community participation' masks highly diversified intentions and realities.

All levels of representation must be included during community *consultation*, including specific traditional structures of the society. The *carrying out* of the project must account for ancestral customs and the calendar of local festivities without becoming blocked by resistance to change, which respecting tradition sometimes implies. To avoid certain sanitary practices that are not suited to community life in a high density urban setting, *education*, and in particular the education of girls and women, is effective in raising the awareness of the entire community. Key messages should be communicated to children, the future inheritors of the project and principal vectors for change, and also to women, who are usually in charge of water supply and sanitation in the home. *Maintenance training* should allow for reproducing simple technical gestures that are essential for the upkeep of local infrastructure (valves and fittings, inspection chambers, piping).

The *evaluation* process provides the community with the opportunity for measuring the progress that has been made and for definitively appropriating the system it will have contributed to installing.

Over the long term, certain precautions must be taken to ensure the continuity of community involvement and the full appropriation of development projects by the inhabitants. The initial consultation must be both sufficient to understand the real aspirations of inhabitants, but also carefully weighted because technical choices are primarily made by professionals. And the impact of a project on the organization of the community itself over the short, medium and long term should not be overlooked. The risk of a project being diverted to partisan ends can thus be avoided (the proximity between local responsible parties and the population intensifies the impact of electoral influences on projects and increases the risk of seeing their goals deviated). Another risk occurs when situations are created in which the 'conditioning' of the population overtakes real participative education based on current recognized methods such as PHAST (see p.130) and SARAR.

And lastly, support for development projects is more or less difficult to obtain depending on the socio-cultural environment. When conflicting interests are exacerbated, some groups may try to compromise or delay the project – hence the importance of knowing the positions of the various community representatives in regard to the actions planned. As types of representation diversify in the urban setting, some leaders may try to exercise their authority over the community and may demand to be consulted on a regular basis, multiplying the risk of destabilising projects. **In order to become thoroughly familiar with a community in all its complexity, a long period of discussion and observation is needed. Even NGOs possessing considerable broad-based experience in the field acknowledge that several months are needed to establish a relationship of trust with the inhabitants of a given district.**

CONDITIONS FOR COMMUNITY PARTICIPATION

Figure 3.5

Four key conditions

- **Evaluate** the social cohesion of the population
- **Identify** the forms of leadership within the community
- **Respect** cultural practices and customs (holidays, beliefs)
- **Encourage** the involvement of women (gender approach)

Advantages

- Possibility of increased understanding of the needs of the population (work in proximity)
- Development of a sense of responsibility as a result of the involvement of future consumers
- Incorporation of local know-how (specific trades micro-businesses)
- The lowering of costs
- The creation of solid bases within the community development and consequently their mobilization for future development projects

Disadvantages

- Dependency upon charismatic leaders
- Development of an elite and the creation of jealous reactions in consequence, seeing violent conflicts of interest
- Not meeting the expectations of the population
- Handling a specific case without thinking of reutilizing the techniques employed in another context
- Criticism for not respecting national development objectives

Source: nomadéis/ «AQUA tu penses?» association

> Strengthen community management by calling in water sector professionals for support: The example of Mali

Potable water supply to small towns in Mali was expanded considerably in the 1990s. At the present time, the rate of satisfying demand is around 50% in semi-urban areas. Most water supply systems in rural centres (less than 5000 inhabitants), in semi-urban centres (between 5,000 and 10,000 inhabitants) and in secondary urban centres (more than 10,000 inhabitants) are managed by consumer associations. These associations benefit from the assistance of the Advisory Unit for Potable Water Supply, designated by the National Water Authority to monitor the technical and financial management of water supply systems.

The Advisory Unit for Potable Water Supply provides assistance to consumers, owners and operators.
The Advisory Unit for Potable Water Supply furnishes technical and financial monitoring tools for consumer associations responsible for system management. These tools, in spiral binder notebook form, are used to keep accounting books and to record work performed on the system. The Advisory Unit closes the management accounts of the consumer associations twice a year. Each closing is reported on during a general assembly attended by all the consumers. The Advisory Unit staff travels to each centre to attend these assemblies, which also provides the opportunity for checking the installations and inventorying the state of repair of equipment, for drawing up a report on maintenance, on service organization and on future needs for equipment renewal, and finally for drafting recommendations designed to improve system management.

The participation of inhabitants via consumer associations

An institutional scheme usually ensures a high degree of citizen representation. The users of the same standpipe unite in informal groups called *robinet-ton*. Each *robinet-ton* designates two delegates to represent it and participate in the general assembly of the consumer association. The representatives of standpipe users bring with them announcements and information allowing for comparisons with the results of other centres and for grasping the general status of the water supply situation. With full knowledge of the facts, these delegates discuss questions such as the choice of the level of service, the renewal of the executive committee or its dissolution, setting the price of water, how savings should be employed, etc. Decisions are taken on the basis of precise data that have been updated and furnished by the Advisory Unit for Potable Water Supply.

How the inhabitants perceive the actions of the Advisory Unit for Potable Water Supply

Consumers view this Unit as an information tool and as a guarantee of transparency. For communities that own their supply system and are responsible for the public service, the Unit provides essential aid in delegating management to operators. The services ensured by the Advisory Unit for Potable Water Supply generally help train local elected officials in the ownership of public facilities. And the technical and financial monitoring provided by the Unit improves system management through the recommendations it makes and its outputs, thus contributing to raising the water service to professional standard. And lastly, operators appreciate the intermediary logistics furnished by the Advisory Unit for Potable Water Supply.

Source: programme Solidarité-Eau

Figure 3.6

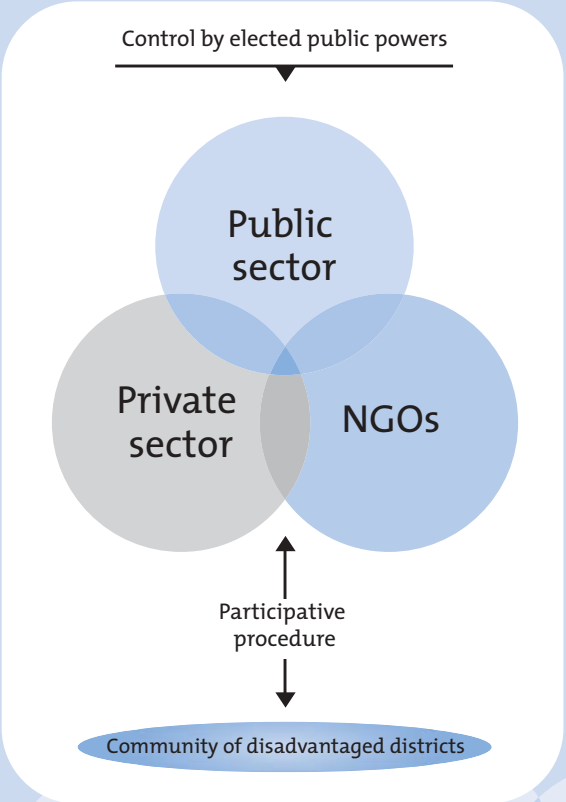
3.4 THE EXPERIENCE OF TRIPARTITE PARTNERSHIPS

Providing sustainable water supply and sanitation services to disadvantaged urban communities necessitates the setting up of innovative solutions which are at once technical, commercial and organizational. Tripartite or tri-sectoral partnerships form an integral part of such solutions.

Constraints related to the rapid development of cities and the socio-cultural specifics of marginalized urban settlements often direct conventional partnerships between the public and private sectors towards the increased involvement of NGOs and district inhabitants. The concerted effort of the public and private sectors, along with that of representatives of citizen groups is generally becoming – depending on the context – more efficient than actions undertaken separately by each sector. The effectiveness of these partnerships depends on the capacity of its members to converge their interests in order to improve service precisely where installing conventional water supply and sanitation networks is very difficult, if not impossible.

These partnership models are based on complementary capabilities, each partner working very closely with all the others to achieve the goals set. The idea is to develop and utilize synergies on three levels to ensure support of the project and the involvement of the inhabitants, effective technical performance, and a sound financial basis. **Without being contradictory, the interests of the respective players (public sector, private sector, NGOs and communities) may be divergent. Project orchestration must thus allow for establishing a consensus among all participants to attain common goals, while guaranteeing the independence of each player and clearly defining their respective responsibilities.**

> The principle of tripartite or tri-sectoral partnerships: the public sector, private sector and NGOs in the service of disadvantaged populations



Elected officials play an essential role: they defend the general public interest, account for needs and constraints over the long term, represent all the inhabitants and encourage their participation.
Tripartite partnerships help governments (local, regional, national or federal) improve the effects of their own policies regarding access to essential services and attract new capital and new skills to their territories.

The public sector is aware of the performance potential and of the limits of conventional potable water supply and sanitation systems in the urban setting. The public sector sometimes has considerable experience in providing services to disadvantaged areas (as is the case of the DMWS, the municipal public operator for water supply for the city of Durban in South Africa, recently renamed eThekwini Water Services). The DMWS has an overall view of the development of essential services and of possible synergies among them. With the aid of other players, the DMWS is able to better ensure its responsibilities.

The private sector, i.e. the operator, shares its technical, organizational and commercial know-how. As a result of its investments in research and development, the operator in the private sector has tried and tested new methods and technologies that more closely respond to the imperatives for modernizing disadvantaged urban areas. By participating in the partnership, private operators can more finely tune their capacity to serve marginalized consumers, and develop new capabilities at the same time. Tripartite partnerships also help operators meet their contractual obligations by helping to increase connection rates and by providing operators with the opportunity to develop concrete actions aimed at attaining sustainable development and at stimulating the responsibility of the population.

The NGO fulfils the role of mediator with the community. Perceived as a player whose motives are neither political nor financial, the NGO opens the way for discussion with the community and confirms its preference for the involvement of the inhabitants. Because of its local set up, the NGO can anticipate and evaluate the risks and opportunities related to the actions undertaken. Its familiarity with the socio-cultural context is indispensable for adapting the project to the local reality and for promoting the participation of inhabitants. The presence of an NGO is also needed to set the gears of social cohesion into movement, to call upon leaders for support at the right moment in order to deal with any reactions that could bring the ongoing project into question, and to ensure that the entire community benefits concretely from the project. In return the NGO benefits from the financial and technical guarantees provided by the other partners who furnish the NGO in part with the means it needs to perform its tasks in the best possible conditions.

Figure 3.7

A formal discussion mechanism can be set up among the stakeholders in tripartite partnerships, thus encouraging joint actions. Such partnerships make it easier for the parties involved to appropriate the development actions, and also reduce the risk of too great a dependency on donors and development agencies, and particularly on international institutions.

However, the tri-sectoral partnership approach is not suited to all contexts. Some projects initiated as part of the World Bank's BPD (Business Partners for Development) programme never came about due to misunderstandings among the partners and the impossibility of arriving at a compromise, or due to too much rigidity in conducting the partnership. Potential partners must evaluate together the risks associated with their joint project very precisely (real costs exceeding estimated costs, possible negative impact on the company image, the disengagement of one of the partners, etc.). In conclusion and despite the many examples of success in the field, there is no set model that can be used in all contexts.

> The BPD pilot project in KwaZulu-Natal (South Africa)

Since March 1999, Veolia Water has been coordinating an innovative pilot project in South Africa in two townships in the province of KwaZulu-Natal (districts created during the apartheid regime and located far from the city centre). The project is being conducted in partnership with the cities of Durban, recently renamed eThekwini, and Pietermaritzburg, as well as with the Umgeni Water Company, the Water Research Commission (South African government) and the Mvula Trust and ELET NGOs.

The purpose of the project is to install sustainable water supply and sanitation systems in disadvantaged urban and semi-urban communities. The project forms part of the BPD (*Business Partners for Development*), a programme initiated by the World Bank and designed to promote the convergence of the resources, expertise and interests of three very distinct sectors: private operators, public authorities and society at large, including NGOs and citizen groups.

More than forty social and technical actions, including studies and projects in the field, have been implemented by these partners over the course of the past three years, notably:

- health education and hygiene sensitization programmes
- the upgrading of facilities and infrastructure
- programmes for lowering water losses
- the design and implementation of suitable levels of service
- information campaigns for consumers
- the training and involvement of local subcontractors
- the implementation of a programme monitoring the partnership and evaluating its results

Tri-sectoral partnerships are not formed according to any real models. Many local parameters must be taken into account during their constitution. Experience has shown, however, that a number of principles must be respected to ensure the viability of projects, and primarily:

- the community must really be involved in all stages of projects
- the public sector must actively participate in the projects, beyond providing institutional support
- the NGO partner must be funded by third parties not involved in the project
- the partnership must be systematically evaluated in regard to all its aspects (cost recovery, the resolution of conflicts, the respect of the task schedule, the balanced participation of players, evaluation of the real impact on those who benefit from the project, etc.).

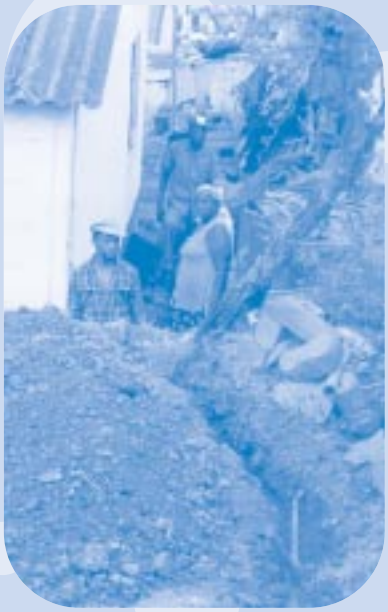
The BPD pilot project in KwaZulu-Natal ended in March 2002. To continue their cooperative effort, Veolia Water and the city of Durban set up another partnership project based on the participation of associations from semi-urban communities. This project was launched during the 1st quarter of the same year. Together, the new partners undertook two actions focused on improving living conditions in disadvantaged urban communities: creating a customer service in proximity, and carrying out of a technical, social and financial feasibility study to develop a system for the reuse of grey water, i.e. domestic wastewater.

Source: Veolia Water

Figure 3.8

Creating a real spirit of partnership takes time. During the first months of a project, priority is therefore given to constructing solid relationships of trust among the future partners. Relationships of trust can only be established if equilibrium is achieved in the contributions made by each party, and only if there is great transparency. When projects are set up hurriedly, it is often to the detriment of establishing exchange with consumers which, by nature, is slow and progressive. In Durban, real mutual trust was created with the passing of time thanks to free and open discussion, which was sometimes informal and outside the scope of institutional meetings. With time, the perspectives of each partner were able to grow and change, although close attention must be paid to the schedule of tasks, which must be divided up and organized into successive deadlines, and then implemented by the partners.

> Examples of actions undertaken by the BPD pilot project in KwaZulu-Natal (South Africa)



Participation of local people in carrying out the earthwork

Upgrading of existing water supply installations

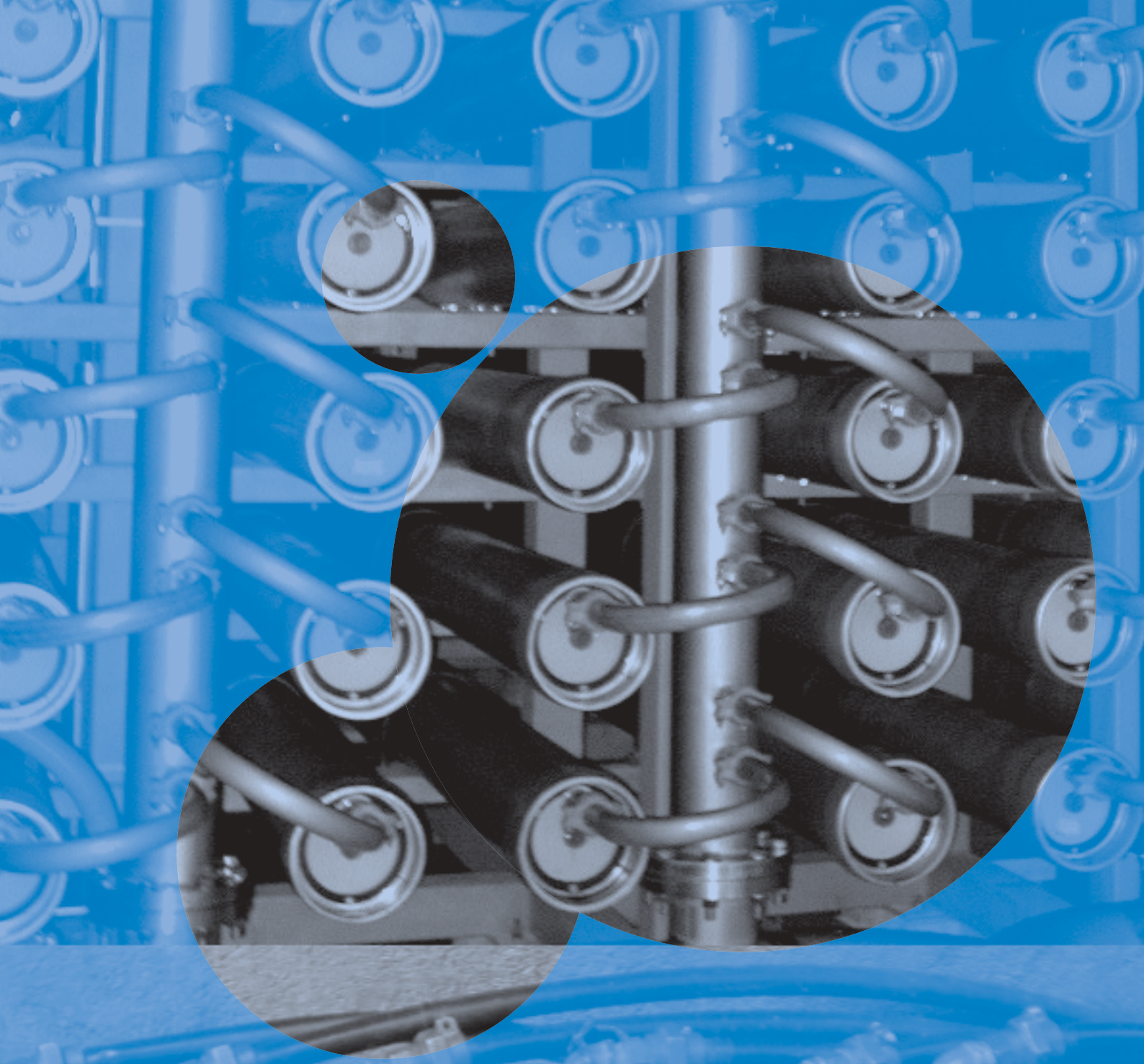
Figure 3.9

The KwaZulu-Natal initiative benefited from a spirit of collaboration that progressively came into being among the partners. As a result of the real and effective tri-sectoral teamwork of this project, the need to strengthen the concept of BPD partnerships has been fully recognized. To meet the specific challenges of disadvantaged areas, it is not enough for each partner to fulfil his role in an isolated fashion – for example, exclusively assigning the NGO the task of educating the community and with being their sole mediator, the public sector with the task of making laws and applying regulations, and the professional operator with managing the water supply system.

The structure of BPD type tripartite partnerships must be sufficiently flexible to allow for the overlapping of actions among the partners. The operator may thus tackle education problems and the NGO customer management questions. But this does not in any way diminish solidarity among the partners, each of whom willingly engages his responsibility in conducting joint actions.

However, weaknesses specific to each player may hinder the effective functioning of the partnership. Transparency and communication are consequently a must at all levels, whether to be objectively aware of the interests of each partner, to accept the financial performance imperatives of the private sector, the political bias of the public sector, or the need for independence of the NGO, etc. Drawing up an agreement that defines the commitments of each partner concretizes the convergence of interests in the project, making it official; the agreement also defines the general project goals, and the responsibilities of and means to be furnished by each partner. The contractual process usually occurs in two stages: first of all a Memorandum of Understanding is drafted, then a co-operation agreement is prepared and signed by all the partners. The agreement delineates the roles and responsibilities of each partner and details their human and financial contributions. The agreement also lists the various bodies to be created for project implementation (steering committee, project teams).

Everyone has the right to water, and the values that are attached to this right demand, sooner or later, the support of consumers and citizens. Both must be fully involved in supporting the water supply policy of their city, not only in its wealthier areas, but in disadvantaged districts as well. And the involvement of consumers and citizens depends on their understanding of the importance of the responsible use of water. Without information, the consumer cannot formulate a knowledgeable opinion, nor can he/she find his/her voice, much less adhere to projects that are proposed by public authorities in partnership with professionals in the sector and the representatives of citizen groups. In the image of a globally democratic society, tripartite partnerships constitute the promise of better communication among all those concerned.



CHAPTER 4

Sharing and applying know-how: the transfer of technical innovations

CHAPTER 4
Sharing and applying know-how: the transfer of technical innovations

Modernizing the management of water supply and sanitation services in developing countries means meeting many technical challenges. The objective is twofold: to ensure the maintenance, upgrading and extension of existing installations, and to accelerate (while respecting cultural differences and local constraints) the sharing of new technologies developed in industrialized countries, along with simple alternative technologies that are less demanding in terms of maintenance, from both a technical and financial standpoint. To accomplish this, the technologies and tools best suited to answering the specific needs of communities must be identified on a case by case basis in relation to existing, heterogeneous systems for the production and supply of drinking water, and the collection, treatment and possible recycling of wastewater. A wide variety of dwelling types, particular topographic features and the unpredictable character of population movements must also be accounted for. In addition, the transfer of capabilities must be organized progressively if skills and knowledge are to be effectively assimilated, with the end goal being to completely hand over operation to local teams.

4.1 Recent technological innovations
4.2 Tools for managing existing installations
4.3 Introducing alternative systems
4.4 Effective ways to transfer capabilities

4.1. RECENT TECHNOLOGICAL INNOVATIONS

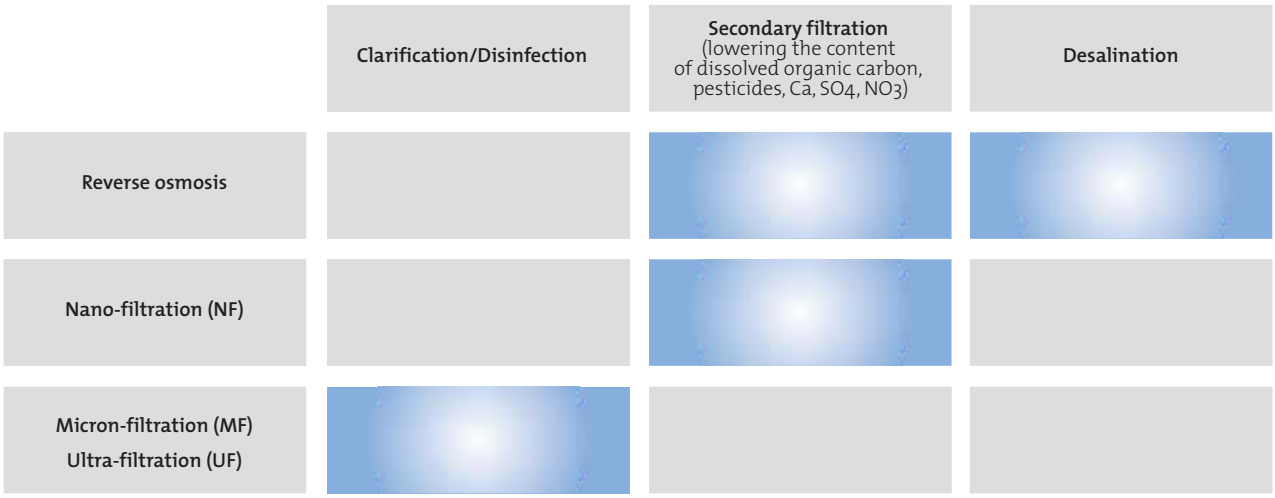
The employ of technological innovations improving the performances of water supply and sanitation services is progressively spreading to developing countries. In the years to come, professionals working in the field of research and development will find a way to lower the cost of implementing new techniques even more, making them more accessible to a greater number. A wider range of supply possibilities will result and everyone will be able to benefit from good quality public service.

Among recent innovations, some new treatment processes offer numerous advantages: the diversification of water resources, improvement of the quality of water distributed, lowering the risks of polluting the natural environment, and consequently the risk of contamination and epidemics. Whether they are of the conventional type or alternatives (which are easier to monitor and maintain and which are sometimes managed by the consumers themselves) these new processes accompany an overall strategy for sustainable development, in combination with efficient water supply and sanitation systems.

To the forefront are techniques employing membrane filtration, because they can be used either in potable water supply or for treating wastewater. Membrane filtration is very effective in lowering both turbidity and the micro-organism count; it allows for limiting the by-products of disinfection and thus for improving the taste of drinking water. Many innovations are due to this process: micron-filtration, ultra-filtration, nano-filtration (depending on the porosity of the membranes employed), immersed membranes, reverse osmosis, etc. Considered until recently as costly and therefore as a practically inaccessible advanced technology, these techniques (the cost of their installation progressively decreasing) will one day change the lives of populations by making access to potable water supply a reality.

MEMBRANE FILTRATION APPLICATIONS FOR POTABLE WATER PRODUCTION

Figure 4.1



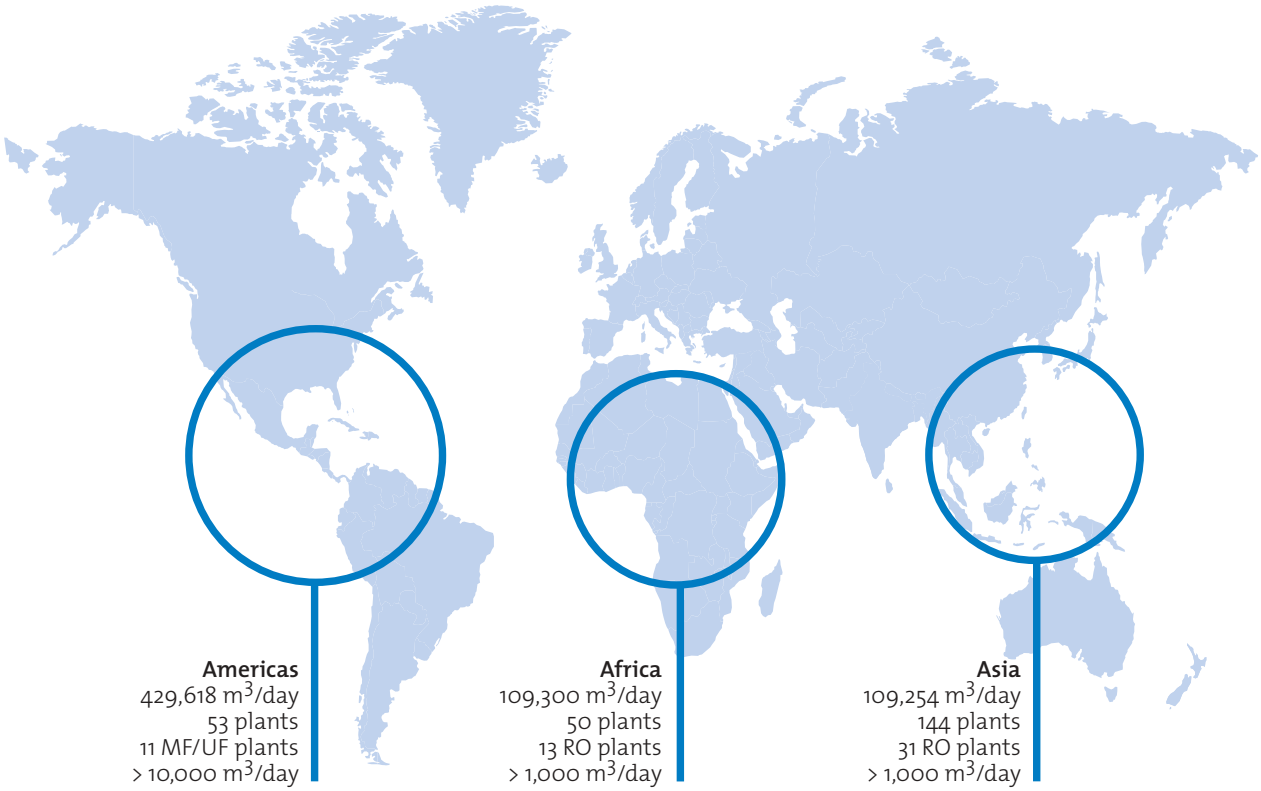
Even though today, membrane filtration techniques are used less than conventional techniques for potable water treatment (clarification, sand filtration, and chlorination, ozonization, or UV rays for disinfection), they are increasingly accessible as a result of research focused on optimizing their

impact. They are already currently used, for instance, to design desalination plants and mobile units at a cost and for quantities of water treated that make this solution advantageous in comparison to the high cost of transporting water over long distances.

Because membrane filtration techniques take up less space, require less energy and fewer chemicals for water treatment, they are very promising alternatives for municipalities engaged in a sustainable development policy.

POTABLE WATER TREATMENT PLANTS BUILT BY VEOLIA WATER EMPLOYING MICRON FILTRATION (MF), ULTRA FILTRATION (UF) OR REVERSE OSMOSIS (RO)

Figure 4.2



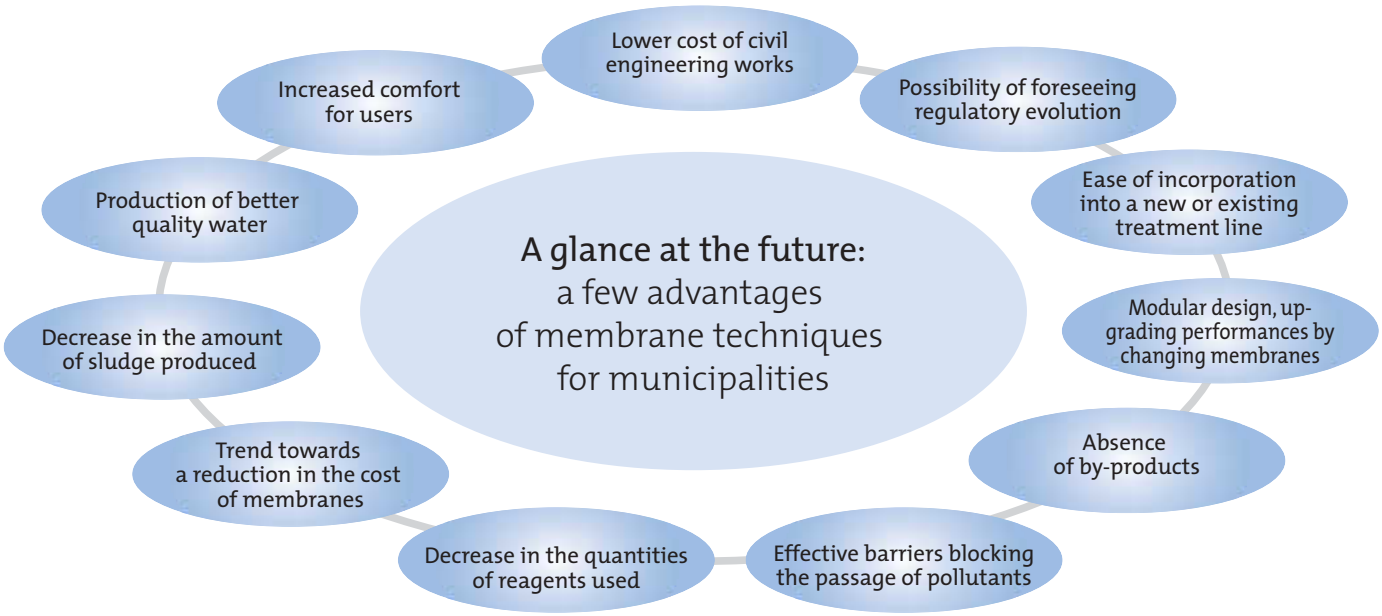
> Seawater desalination

Fresh water, which only represents 2% of the world's water resources, is becoming scarce. To anticipate the growing needs of populations living in regions where fresh water is in short supply, a few international operators have developed innovative techniques to desalinate seawater and brackish water. Two basic processes, **thermal desalination** and **membrane filtration desalination** can be combined when this lowers costs and increases performance. Even though the capital outlay and operating costs per cubic meter of treated seawater have been halved in ten years, desalination remains an expensive process, one that is still relatively inaccessible to most developing cities. But the costs will continue to drop and this technique will rapidly become a very interesting solution for supplying hundreds of coastal cities suffering from drought.

Figure 4.3

The utilization of new membrane filtration techniques plays a decisive role in public health. With membrane micron-filtration for instance, the continuous production of potable water complying with the strictest bacteriological standards is ensured by means of hollow fibres that retain the finest of particles, including micro-organisms. This process eliminates pathogenic parasites resistant to chlorine in particular. By regular unclogging and cleaning by the injection of compressed air, membranes can be freed of the impurities that have collected on their fibres. Membranes have a lifespan of over five years. The membrane filtration system also has another advantage: it is compact and composed of modules. Pre-assembled in transportable elements, the modules that comprise the unit do not require any use of concrete.

Figure 4.4



In addition to potable water production, membrane filtration techniques can be used to treat wastewater, which can then be recycled for industrial and irrigation needs, thus ensuring better global protection of the ecosystem. This spares water resources that can be used to meet the domestic demand for drinking water.

Membrane filtration techniques also present the advantage of promoting the utility of efficient collector networks for removing liquid waste harmful to public health. On the basis of a 20-year BOOT contract (Build, Own, Operate, and Transfer) signed in 2001 and covering the treatment of wastewater for its reuse, the city of Durban in South Africa (recently renamed eThekwini) has been able to protect its water resources and at the same time increase the volume of potable water available, in particular for supplying peripheral districts. As a result, 8% of the total potable water available has been freed up for human consumption.

Other innovative technical processes are also promising for meeting the needs of communities in developing countries; one of them is activated charcoal filtration. This process is relatively inexpensive and allows for increasing the quality of potable water, primarily by eliminating pesticides, which conventional treatment methods (pre-treatment, coagulation, flocculation, clarification, sand filtration) do not allow (removal by retention on activated charcoal or by means of nano-filtration). Activated charcoal absorbs impurities under the effect of electrostatic forces; pesticides are trapped on the surface of the charcoal. Made from wood, coal or coconut, the charcoal is basically composed of carbon (90%), which has been activated by thermal or chemical treatment. Extremely porous, the activated charcoal offers a contact surface of from 1,000 to 1,500m²/g. In the form of grains, it is installed in pressure filters across which water is percolated for around twelve minutes. The lifespan of activated charcoal depends on the characteristics of the water to be treated (organic matter and pesticide concentration), but once saturated, it may be regenerated by thermal treatment, which reinstates its absorbent properties.

4.2 TOOLS FOR MANAGING EXISTING INSTALLATIONS

Other innovative techniques are used to upgrade, manage and optimize the operation of potable water distribution and sewage water collection systems. Designed to preserve and maintain existing networks, these techniques require a thorough knowledge of system operation and of the real state of repair of the installations. An inventory of resources, of production and treatment plants in operation and their state of repair, the accuracy of existing drawings and of measurement instruments all precede the effective management – and even monitoring – of supply.

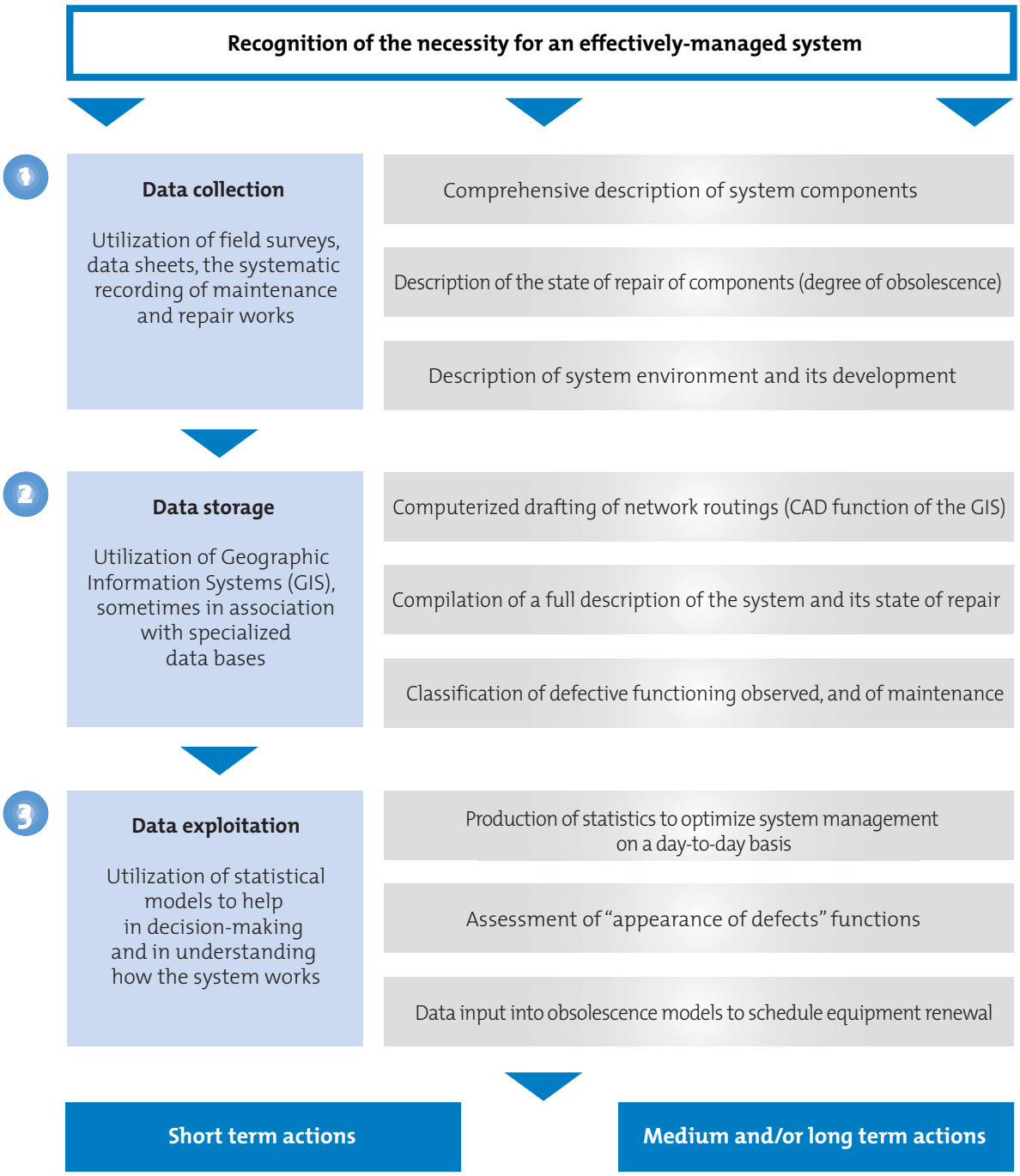
Whereas communities in industrialized countries base their actions on these prerequisites, some communities in developing countries suffer from a lack of information concerning their proper management systems. The poor state of repair of some infrastructure, the creation of draw-offs and micro-networks by players who usually form part of the informal sector, along with unexpected population movements make it extremely difficult to obtain such information.

To improve management of their potable water supply and sanitation systems from the perspective of sustainable development, developing communities need modern tools and techniques to assess as accurately as possible the characteristics and condition of their installations.

The very goal of a public water supply service is to ensure the production and distribution of good quality water in sufficient quantity and at an acceptable pressure in relation to system capacity, while respecting regulations designed to preserve water resources and the environment, and protect both the public and personnel. Professionals have developed specific tools and methods for inventorying installations to help communities achieve these goals. Several of them are based on a Geographic Information System (GIS) and allow for a detailed computerized view and a comprehensive inventory of existing infrastructure. The diagram on the opposite page proposes an approach in three stages for inventorying potable water supply networks.

A THREE-STAGE APPROACH TO INVENTORYING POTABLE WATER SUPPLY NETWORKS

Figure 4.5



> Improving management of potable water supply systems: the case of Calcutta in Bengali (India)

In 1999, the Seureca Space Company (an engineering design office and subsidiary of Veolia Water) was put in charge of improving the potable water supply system for the city of Calcutta in India (6 million inhabitants). Many studies were carried out, including:

- making a hydraulic model of the system and its transcription onto new maps
- the installation of a system to monitor network flow rates
- meter installation and management for major consumers
- the development of a software package linked to the GIS (Geographic Information System) designed to monitor flow rates, pressure, consumption, billing and cost recovery
- the carrying out of a leak detection programme

As is the case in many large Indian cities, Calcutta's water supply service is faced with a double challenge: water shortage and obsolete infrastructure. Until 1999 water was available only 4 hours per day at best and at very low pressures. The metering of water consumption was either inexistent or very defective, and the volume of water lost in the city networks represented nearly 40% of the volume produced, or more than 450,000 m^3/day. Programmed over a three year period, the work performed by Seureca Space considerably improved in sustainable fashion the level of service and the quality of the water distributed, despite limited investment. The programme of works included:

- a complete inventory of the water supply and sanitation networks in a selected area
- transferring operation of new high technology equipment to local teams, including training of the latter
- a more accurate assessment of consumption, and specifically that of the city's 100 biggest industrial and commercial customers
- net improvement in network efficiency following the carrying out of a leak reduction programme

Source: Veolia Water

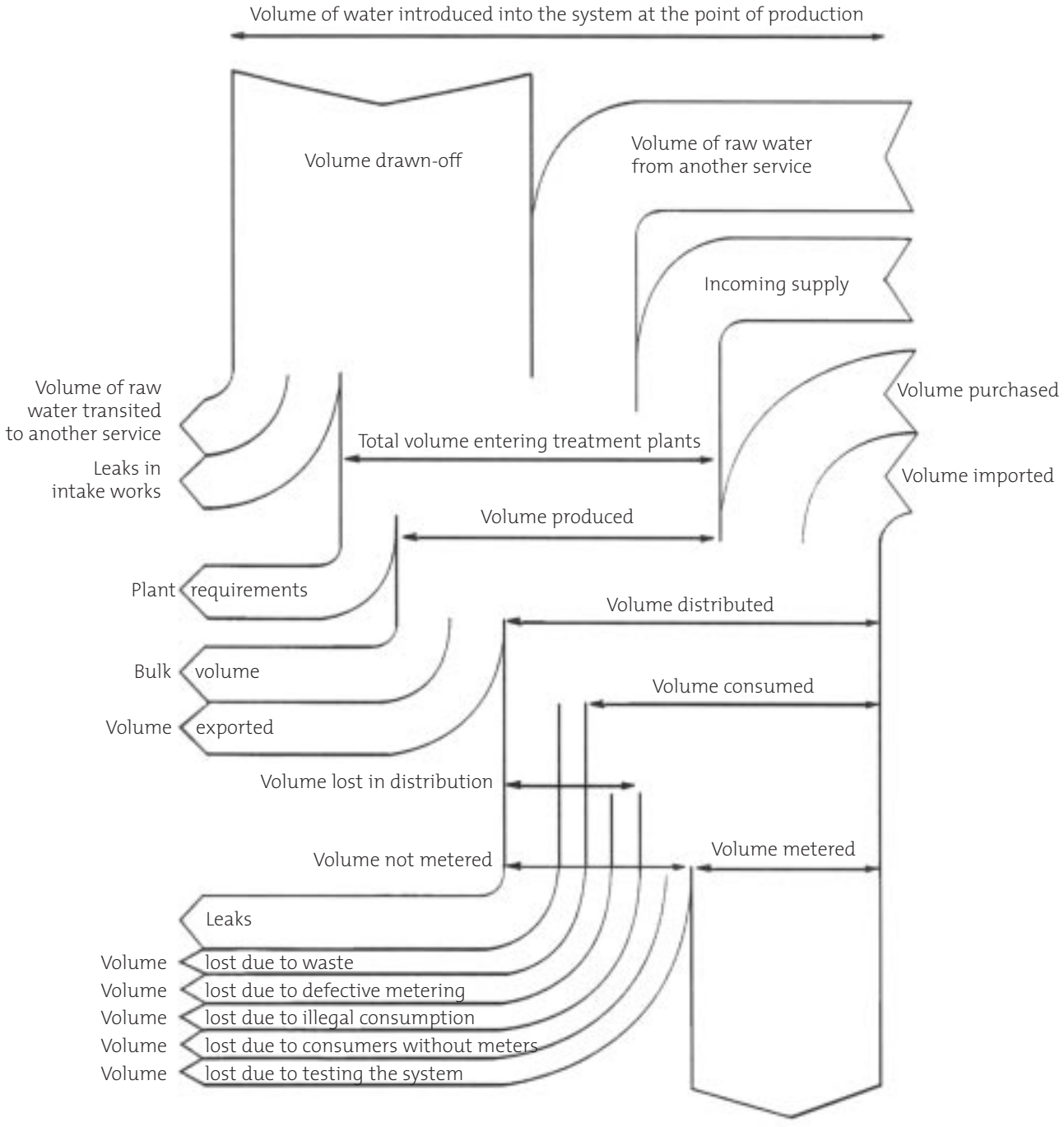
Figure 4.6

There are all kinds of line losses in distribution networks, and many different reasons for them. Losses occur in supply mains, at branch connections to all categories of consumers, and at public access points, for example at standpipes in a very poor state of repair, because inhabitants prefer seeing the water spring forth permanently rather than having to work the pump. Leaks can also be the consequence of the type of terrain (slides, vegetation), of climatic conditions (freezing temperatures, floods), of the piping material used (defective joints), of the chemical composition of the water distributed (causing corrosion to pipe interiors), of the conditions in which the piping was laid and is maintained, and even of excessive pressure in the lines. And lastly, acts of vandalism or illegal work on the lines (illegal connections, the destruction of some installations) also lead to line losses and/or may hinder the proper functioning of the system.

Figure 4.7 shows the principal "paths of water", i.e. all the elements which must be accounted for in assessing the total quantity of water lost in a given area.

ASSESSING THE QUANTITIES OF WATER TRANSITING IN A POTABLE WATER SUPPLY SYSTEM

Figure 4.7



This diagram regroups all the factors to be accounted for in assessing the volumes of water transited in a potable water supply system. Taken from a special issue of AGHTM No. 481, May 1990.

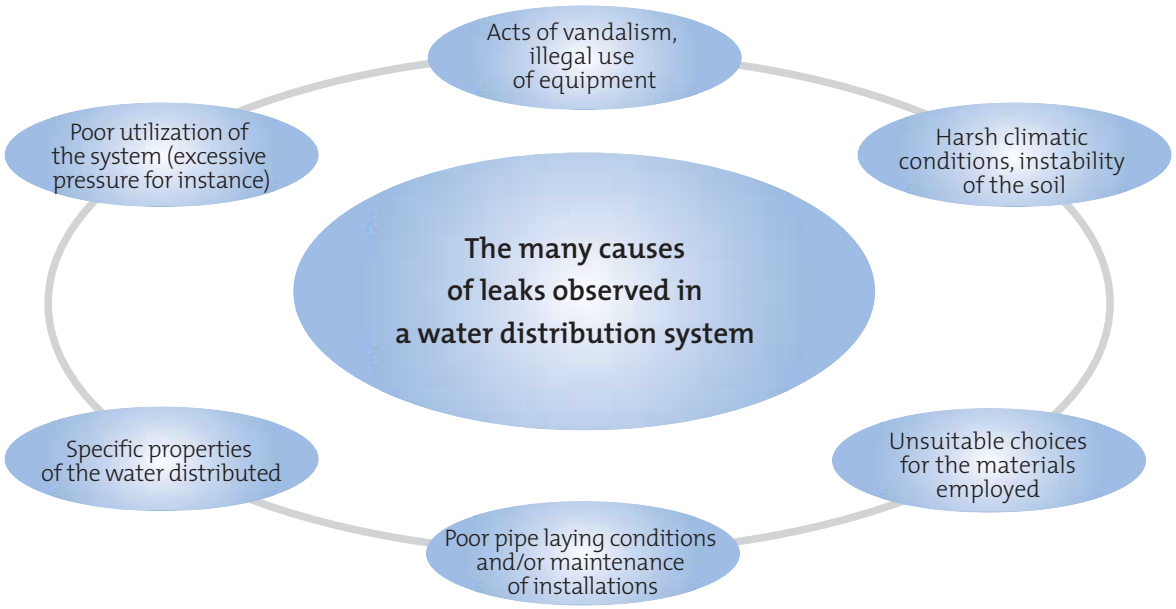
> Consequences of line losses for the community

- Low pressure at consumer connections
- An increased risk of polluted water entering the lines
- Deformation of the ground and road problems
- The need to oversize works leading to extra investment costs
- An increase in operating costs (energy, treatment products, etc.)
- Possible cut-offs during periods of severe low water level
- Possible artificial increases in billing rates

Figure 4.8

POSSIBLE CAUSES OF LEAKS IN A WATER DISTRIBUTION SYSTEM

Figure 4.9



The two methods currently used to detect leaks are acoustic correlation and the quantification of losses:

- **Acoustic correlation:** meters monitoring distribution are installed at strategic points of the system in order to precisely record night consumption in the various sectors supplied, and more specifically to localize major leaks in priority sectors.

- **Quantification of losses:** by measuring the instantaneous consumption rates on a portion of the distribution network, sectors that are defective can quickly be isolated. This technique is very useful for distribution networks in grid configuration.

In conclusion, an investigation to determine the way in which existing infrastructure is managed, a network assessment, a leak detection and repair programme and fighting against waste all work towards developing an effective policy for system operation based on reliable methods that help in decision-making. **The objective is to make optimal use of water resources in order to delay or even avoid the need for new investments in potable water production and/or network extension.**

4.3 INTRODUCING ALTERNATIVE SYSTEMS

Today a number of alternative systems for water supply and sanitation have improved access to essential services in the cities of developing countries. These systems are often developed by the populations themselves, in their search for technical or organizational solutions suited to their needs.

Professionals are not the sole innovators in the water supply and sanitation sector. Through an empirical approach, local players (associations, suppliers, public authorities, etc.) often come up with solutions that are adapted to the cultural, social and economic features and needs of local populations.

Institutional programmes have been set up to inventory and analyse such approaches in order to share experiences and avoid repeating efforts needlessly.

Advanced technologies for potable water supply and sanitation are only of interest if they are combined with distribution and collection methods adapted to local requirements. In the specific case of disadvantaged urban settlements, experience has shown that alternative systems sometimes provide better solutions, especially in the short and medium term when financial constraints and the outlying fringes of the urban fabric make it impossible to satisfy a house connection policy with any rapidity. But the coexistence of several systems in the same area or within the same urban complex also poses problems: differences in performance level, competition among systems, etc. In order to preserve the overall quality of public service, alternative systems should not interfere with the operation of existing, conventional systems.

The *Bayan Tubig* programme in Manila (Philippines): an alternative solution in disadvantaged districts

Maynilad Water Services (MWSI) is one of the operators responsible for managing the water supply and sanitation services of Manila, a city with approximately 12 million inhabitants. The MWSI implemented a policy in 1997 to improve the rate of connection in the area it manages. As a result of its policy-based programme, called *Bayan Tubig*, meaning *water for the community*, MWSI has made more than 100,000 new connections, half of which are in disadvantaged urban areas.

The programme consisted of offering local communities the possibility of making their own hook-ups to a *master meter*, and in inviting them to manage their distribution subsystem themselves. Earlier socio-economic surveys performed by MWSI had indicated that consumers (including those living in the capital's disadvantaged districts) preferred individual house connections to shared public access, even though the latter is less expensive.

From a technical point of view, the *Bayan Tubig* programme is composed of three types of networks:

- *A primary network*, consisting of the buried supply mains located the closest to the community to be connected.
- *A secondary network* of distribution pipelines laid directly on the ground, or either partially buried or fixed to the walls of dwellings, when laying the piping in trenches is not possible, for example when the streets are too narrow.
- *A tertiary network* in which each household makes its own hook-up using standard flexible hose to the set of meters, the quality of the connection being checked by MWSI.

The *Bayan Tubig* alternative supply system provides an original solution to three major problems:

- **The narrowness of streets and lack of space** is a serious handicap in relation to a conventional supply system and necessitates the digging of trenches, a procedure that can sometimes be delicate in very cramped quarters. The *Bayan Tubig* programme authorizes consumers to run flexible hose along walls and through the streets to the master meter unit, thus making the individual house connection a real possibility.

- **The scattered layout of dwellings housing the poor** makes the marginal extension of a conventional network to supply them an extremely costly undertaking. The overwhelming simplicity of the *Bayan Tubig* connection method allows for lowering hook-up cost to a minimum and consequently for including a maximum number of households in the connection plan.

- **The lack of reliable statistics and the extreme mobility of populations** often make it impossible to plan the deployment and extension of distribution networks in the long term. Flexible and relatively easy to implement, the *Bayan Tubig* programme ensures access to water supply for disadvantaged consumers in the time it takes to install the hook-up.

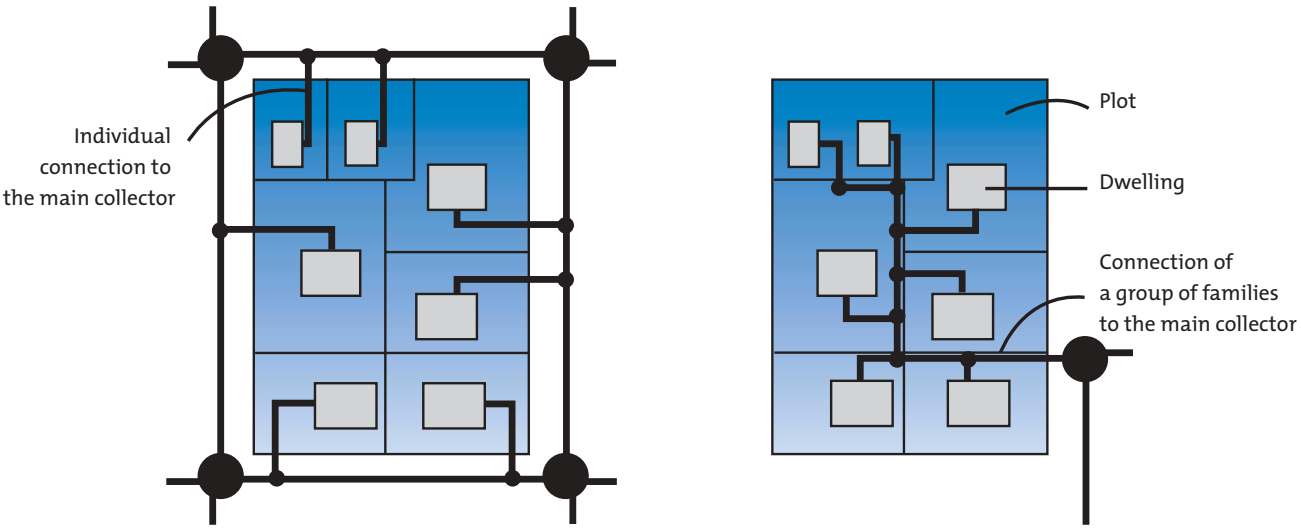
The *Bayan Tubig* system does have one drawback, however: it transfers to the consumer a considerable part of connection and maintenance responsibility. One of the key factors to system success resides therefore in the capacity of the operator to monitor the quality of the connections made by individuals and to ensure regular maintenance of the district's principal roads.

● Condominial sewerage systems

Condominial sewerage systems first made their appearance in Brazil at the beginning of the 1980s. The initial objective was to compensate for the lack of sanitation in poor urban districts in the northeast of the country, in particular by proposing new forms of management and maintenance. Very easy to set up in inhabited districts and in future housing estates, the system progressively spread throughout the country to meet the demand of municipalities to provide sanitation for the inhabitants of districts located far from any public infrastructure.

CONVENTIONAL AND CONDOMINIAL SYSTEMS FOR ORGANIZING SANITATION NETWORKS

Figure 4.10



CONVENTIONAL SYSTEM
(individual connection)

CONDOMINIAL SYSTEM
(connection by "blocks")

Today this system covers a wide range of techniques and installation procedures. The semi-private collection of household wastewater is usually effected on a block by block basis to allow for the installation of independent treatment systems managed by groups of families. The network layout of each block is different because it is adapted to existing constructions and future housing estates. A simplified technical design is used for the installations (smaller diameter collectors laid at a shallow depth either at the back of the house plot or under the sidewalks so as to avoid disturbance to the inhabitants). In poor districts where the water consumption rate is rather low, the sizing of the sewerage system is more complex because solid effluents need water in abundance to be carried away. Pipe diameters have thus been decreased in order to create sufficient pressure to transit sewage water.

Domestic installations typically comprise four elements: **sanitary installations** (toilets, sinks, wash basins, drains), **the branch lines** connecting each fitting to the house collection pipe, **an inspection trap** (usually located inside the house) to which all waste and sewage water is run and **an inspection chamber** allowing access to the drainage piping and system maintenance. The discharge piping from the inspection chambers of each dwelling is run to the main collector (usually in the street), which collects the sewage water from several blocks (generally covering from 50 to 200 dwellings) and transits it to the treatment system.

At a local level, the condominial method promotes urban development that is compatible with decentralization policies. By encouraging inhabitants to participate in carrying out work, and to work together, the method helps lower welfare dependency. At district level its impact is very positive on street appearance. The method thus improves the standard of living while allowing for making substantial savings compared to a conventional sanitation system.

The viability of this method over the long term depends, however, on installing a condominial sewerage system that is backed by the participation of the population concerned. Because each block constitutes an individual case it must be equipped in relation to its specificities. Households that do not want to be connected to the condominial system should be able to benefit from an individual connection directly linked to the main collector laid in the streets. At block level, the illegal connection of a household that was not at liberty to choose the solution it wanted endangers the viability of the entire system (particularly from a financial standpoint). **Socio-economic surveys are needed far in advance in order to become acquainted with future users and to evaluate their capacity to use a condominial system, and consequently to foresee any incompatibility the system may have with certain practices or beliefs of the population.** The problem lies not with the initial level of participation of the population but with its ability to operate and maintain the system over time.

To avoid the progressive abandonment of the installations and the return to more traditional practices, such as wells or pits in backyards, **the technical installations must be accompanied by a sensitization and health education programme designed to explain system operation and encourage its use** (by means of brochures, public meetings, models, street theatre, etc.). And lastly, **maintenance responsibility and methods must be clearly defined among the operator, the municipal departments and the community of customers.** When maintenance is the responsibility of the community, technical training is needed to ensure that the required skills are transferred to the population or to selected maintenance crews.

The success of a condominial sewerage system project is conditioned by a number of socio-economic and cultural factors of community life. The support of local organizations or specialists (particularly sociologists and educators) is thus essential if the technical actions of the operator are to be effective in promoting the advancement of health and hygiene in the district. The results of condominial sanitation projects vary from zero to total success depending on the way in which these conditions are respected.

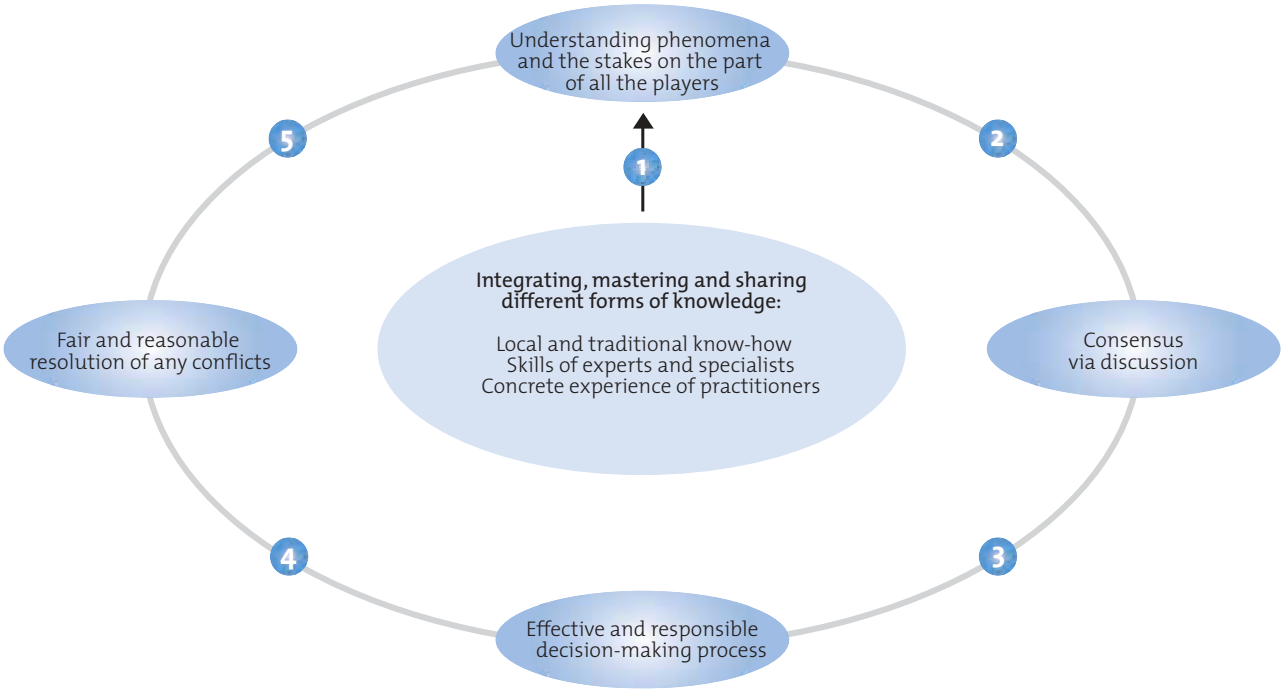
4.4 EFFECTIVE WAYS TO TRANSFER CAPABILITIES

The organization, management and development of water supply and sanitation services demand the participation of a great many players whose means and capabilities are very different. Sharing know-how is an essential key to any policy for sustainable development. Solid skills are needed to understand phenomena, to obtain a consensus concerning decision-making and to fairly and reasonably resolve any possible conflicts.

In 1999, Veolia Water set up a water research centre in partnership with the University of Science and Technology (UST) of Hong Kong. The activities of this centre illustrate Veolia Water's determination to carry out research locally in order to adapt new techniques to local specificities, to perform the technical transfers required to its local subsidiaries and to establish cooperative efforts locally to generate new ideas and new skills within the company. Beyond this cooperative effort, the Veolia Water research team in Asia is currently developing specific technologies designed to meet the needs of this part of the world, working to optimize the management of both seawater and fresh water and the treatment of waste and sewage water. The goal of this research is to satisfy the demand for potable water and the wastewater treatment requirements for the city of Hong Kong, and more generally for the whole of Asia.

SHARING KNOW-HOW, A DECISIVE STEP IN SUSTAINABLE DEVELOPMENT

Figure 4.11



Technical assistance and capacity building contribute to improving the effectiveness of local institutions responsible for the management of water supply and sanitation services. **Initiatives specifically aimed at rendering communities technically independent, called *community empowerment*, are essential in the combat against the marginalization of disadvantaged populations.** Not only the community, but also public authorities, must be mobilized to attain this goal, so as to set up the legal and administrative framework that ensures the effective functioning of community institutions, including the setting up of consultative structures, for example.

The sustainability of water supply and sanitation services set up and/or managed by international operators in developing countries depends on the capacity of these professionals to comprehend local cultures and practices. Learning the local culture and customs also provides the opportunity for discovering and promoting local talents, which is crucial in terms of managing human resources and selecting local providers of services.

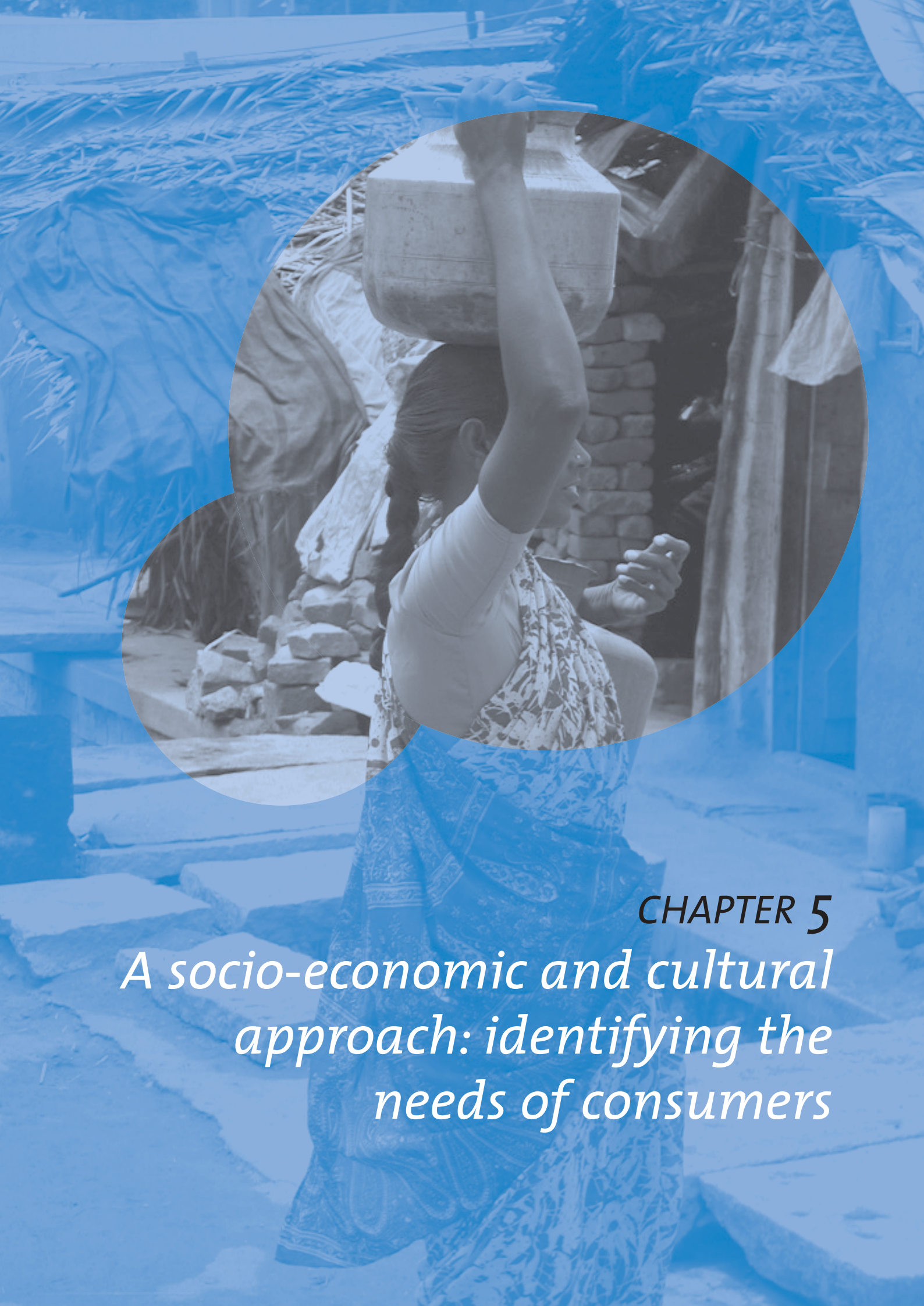
Developing the capacities of local personnel is a priority for a company such as Veolia Water, which each year sets aside nearly 4% of its total payroll to train personnel in order to respond to ever-changing demands in the water supply and sanitation sector. The basic goals of training are to:

- improve the technical capacities of operators
- anticipate needs related to development and to the sharing of new techniques in the water sector
- capitalize on and transfer the skills acquired continously
- encourage personal development and career advancement
- mobilize personnel in relation to priorities defined by communities

Training is designed to improve project management, strengthen the quality of public services, and ensure greater worker safety; the methods and tools employed are adapted to the local context and to the skills required. Training may cover the laying of sanitation lines, the operation of pollution removal and sewage treatment plants, sewage water analyses, the repair of collector networks, hydraulic engineering applied to sanitation, etc. The training itself may be of various types or use different means to facilitate assimilation by the personnel concerned, but the focus is on practical training for which concrete teaching materials such as machines, learning-oriented software and models are employed.

Creating training programmes adapted to the local context first of all means identifying needs, and then monitoring the development of capabilities with local authorities and the community to define a pertinent strategy for training local personnel *at the right place at the right time with the right tools*. A wide range of teaching methods are generally employed (courses by correspondence, training sessions, practical work sessions, professional training in the field, tutorials, self-training, simulators, resource centres, etc.) to allow local personnel to improve their performances through continuing education.

Concrete initiatives to identify best practices and improve the sharing of South-South experiences are essential elements of knowledge transfer. Innovative solutions are encouraged, then tested and may possibly be scaled-up if required, even when the political, socio-economic and cultural contexts are not the same. None of these contexts should be overlooked: respecting cultural diversity characterizes not only a democracy, but on a more immediate level, the capacity of individuals and communities to adapt to specific situations. Moreover, the sharing of experience is a real help to community decision makers who are often faced, from one area and one country to another, with similar problems.



CHAPTER 5
A socio-economic and cultural approach: identifying the needs of consumers

CHAPTER 5
A socio-economic and cultural approach: identifying the needs of consumers

The general approach of the United Nations has always been to place the concerns and needs of users at the core of the development process. Municipal departments responsible for urban maintenance are now starting to make technical and organizational choices in which they involve their constituents. The operators of public water supply services must pay special attention to the needs and demands of consumers in disadvantaged districts because the environment in which these consumers live is particularly complex and difficult to access (topography, security, lack of statistical data, etc.).

5.1 Getting to know consumers
5.2 Fully comprehending the diversity of needs
5.3 The setting up of differentiated services
5.4 An integrated application: customer relationship management (CRM)

5.1 GETTING TO KNOW CONSUMERS

Many municipalities and operators in developing countries are today expressing the need for methods to better understand the practices and expectations of consumers in order to improve public services and increase customer satisfaction. Municipalities can obtain the advice of experts in this field by consulting water distribution specialists, who are accustomed to evaluating their performances in relation to customer satisfaction, and also by contacting associations and non-governmental organizations, both of which are fully versed in community communication techniques.

To understand daily practice and the different ways in which water is used in marginalized urban areas, there must be real dialogue with consumers. This is sometimes a question of time. Only by establishing a relationship of trust and mutual respect can valid qualitative and quantitative data be obtained. Understanding relationships between men and women in a given community helps identify the representatives who will express themselves without bias. In many instances men still

speak out too often to state preferences and household needs when in reality women are in charge of managing water on an everyday basis. Women should consequently be addressed and their participation sought because it is women, not men, who primarily use and manage water in performing daily domestic tasks (washing clothes, dishes, bathing the children), and in running economic enterprises (crafts, small restaurant services).

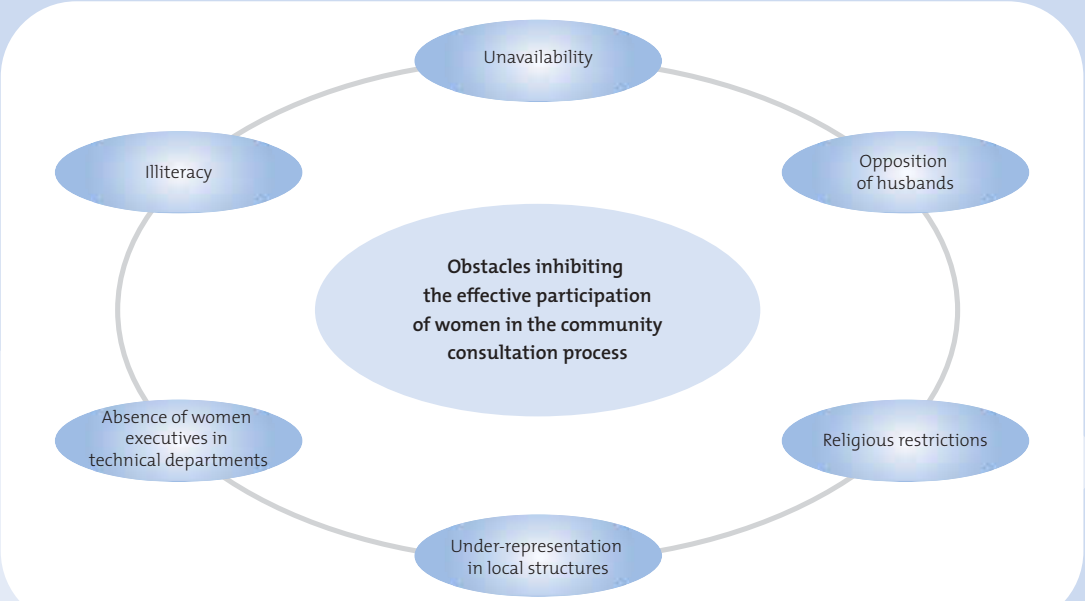
Placing consumer needs at the very core of the concerns of water supply services presupposes that the main categories of consumers who will benefit from the service have been identified beforehand. These categories may group together consumers whose activities and uses of water differ significantly. Consumers consequently express preferences that are sometimes incompatible with the level of service selected. Water supply is often communal in disadvantaged districts; this situation must be improved so as to provide service to each household individually. The entire community must therefore be consulted in order to obtain a level of service that corresponds to the aspirations of the population as a whole. And community participation must be based on reciprocity, instead of limiting its involvement to validating specific technical choices. An interchange of this type is rather difficult to achieve, however, when the interests of the various categories of consumers are contradictory.

In every community there are multiple power plays among its various social groups (community leaders, distinguished citizens, religious leaders, youth, the elderly, women, etc.). The status, rights and consequently the legitimacy of each community member are usually determined by age, sex, ethnic group and income level. The poorest women and children usually belong to the most marginalized groups, and it is for this reason that particular attention must be paid to them when consumer needs are being identified. Sufficient data concerning the socio-economic situation and both tangible and intangible needs must be obtained during the water demand evaluation performed within the community. Careful attention must also be paid to economic capacities and the cultural traditions and practices of the various social groups represented. The potential impact of a new infrastructure project on the life of the community, in terms of how time is spent and work distributed, how access to resources is organized and even the perspectives for social change, can be evaluated more accurately and be better adapted on the basis of these data.

● The importance of the participation of women

In most areas undergoing development, women are usually in charge of water in the household. The uses of water – preparing food, washing and other household tasks – are very specific. Unfortunately the participative approach is still too often limited because women are absent from the discussion and decision process during the preparation, implementation and monitoring of development actions. And yet **the involvement of women is an essential condition for ensuring sustainable development**. To obtain an accurate view of local realities and identify the community's most effective representatives, an approach by gender (women/men) is thus absolutely essential. In spite of their responsibility in the financial management and daily provisioning of the household, women are often excluded for sexist reasons from effectively participating in the community consultation process.

> How to avoid obstacles inhibiting the effective participation of women in the community consultation process



Information and dialogue

Use the local information channels that are the most likely to reach women.

Representation

Encourage women to designate their own representatives themselves by accounting for criteria such as the trust that has been invested in potential candidates, their capacity to make contact with others, their aptitude for leadership, their availability and the support of their family.

Organization of meetings

Encourage the active participation of women during project meetings by selecting meeting places, dates and times that are most accessible to them, making sure they are informed about upcoming meetings and invited to attend. Help them find a seat in the meeting room to keep them from remaining in the back rows. Employ the language and/or local dialect spoken by women and organize speaking time for women during discussion periods.

Decision making

Involve women in all steps of the decision-making process, in selecting agents to participate in the project and committee members, in designing and selecting the locations for supply/sanitation installations, in defining local management setups, etc.

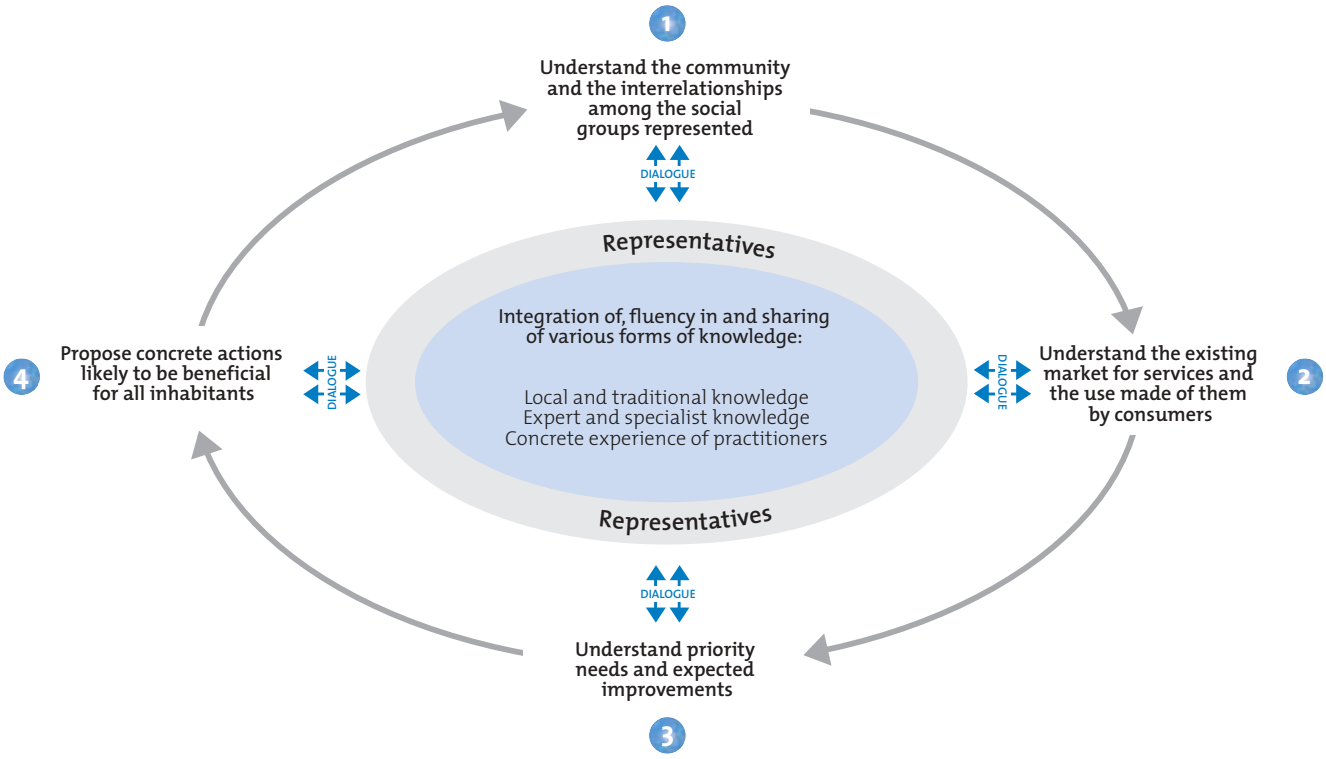
Management	Give preference to traditional customs and skills to identify where, when and how to attribute new roles to women in the field of hydraulics, and primarily for managing water, waste and land use, for maintaining and repairing water supply points, for hygiene sensitization campaigns, latrine maintenance, budget control, etc.
Training	Encourage project directors to promote actively the equal participation of men and women in training programmes (technical, health-related, etc.).

Source: programme Solidarité-Eau.

Figure 5.1

ESTABLISHING DIALOGUE WITH THE COMMUNITY AND ITS REPRESENTATIVES: FOUR KEY STAGES

Figure 5.2



To get to know the population, i.e. the end consumer, one must learn about neighbourhood services that have sprung up within the community since their very creation. A detailed evaluation of the local market (players, technical features, established prices, derived services, shortcomings, expected improvements) very often reveals the true needs and stakes related to water supply and sanitation services. Consumer preferences are expressed according to different criteria, depending above all on whether or not access to water supply is communal, on the availability of water, the proximity of supply, its quality and cost. It is all the more difficult to rank these criteria because expectations vary sometimes quite sharply from one household to another. In some cases, consumers are willing to pay a higher price for lower quantities of water, in particular when they then have a cleaner space in which to do their washing – the bucket of water thus becomes the billing unit for an associated service.

Specific tools analysing water demand are used to establish priority needs and the improvements the population expects from their water supply and sanitation services. But the use of such tools presupposes defining the demand for water. How should the demand be represented? What are the main parameters? How should parameters be measured and above all, in light of what objectives? The demand for water is as diversified as the context, and it is for this reason that demand is often expressed in a variety of ways. At the very least, three complementary interpretations of demand must be distinguished: scientific, economic and socio-cultural.

ESTABLISHING DIALOGUE WITH THE COMMUNITY AND ITS REPRESENTATIVES: FOUR KEY STAGES

Figure 5.3

	Scientific interpretation	Economic interpretation	Socio-political and cultural interpretation
Representations of demand	Quantities of water required to supply a given population	Consumers' willingness to pay for a given service	Expression of a need or a right to ensure social fairness
Operational goals	Optimize the sizing of the works to supply water in sufficient quantities in compliance with imposed technical and health standards (reliability, continuity of supply, etc.)	Optimize the definition of the commercial offer for services with consumers (cost of a hook-up, billing rates)	Improve the living conditions of disadvantaged populations and encourage greater participation on their part in making decisions concerning service management
Measurement focus	Technical data recorded at the installations, consumption levels and requests for future improvements in operation of the service (management, maintenance)	Economic and financial data: household incomes and expenditures, the willingness to pay for various levels of service, desired level of subsidy, etc.	Identify the priority needs of the various social groups, identify present and potential conflicts among consumer categories or groups, identify cultural practices and beliefs, normative values
Measurement tools	Generally accepted estimates based on standards for supply; assumptions based on the most feasible option; Revealed Preferences Surveys (RPS)	Contingent Evaluation Method (CVM); Revealed Preferences Surveys (RPS)	Participatory Rapid Appraisals (PRA); community meetings and focus groups

● Contingent evaluation tools for identifying the demand for improved water services

The demand for improved services is primarily determined by system reliability, its overall cost (selling price plus the efforts made to cover distances to reach water draw off points, and waiting times), the availability of traditional alternative resources (free), and finally, the quality of the water and state of repair of supply points. The willingness to pay for improved services depends a great deal on potential consumers' awareness of such systems (informative bias).

When the demand for an improved potable water supply service that doesn't exist as yet must be identified, the evaluation is called *contingent* because the service is hypothetical. There are two possible ways to perform contingent evaluations: either directly by means of a survey (inquiries identifying the *willingness* to pay, joint analyses, focus groups) or indirectly, using behavioural models set up in relation to existing supply practices.

Among direct methods, only surveys focused on the willingness to pay have been scientifically validated. Research conducted by the World Bank's *Water Research Team* has demonstrated that predictions concerning the choices of households based on a willingness to pay survey can be very accurate on condition, however, that specific methodological rules are strictly respected.

Until the present time, the indirect approach has only produced models whose field of application is limited to the site for which the models were made; in addition, their reliability does not withstand the test of time. Behavioural models based on a city or small urban centre cannot be transposed to other sites. Nor can they be used to reliably predict choices in the same city or centre a few years later. **The most promising and most reliable models are those that are constructed as part of research work following a holistic approach.** On the basis of the results of surveys carried out in fourteen cities and secondary centres located in four countries (Benin, Guinea, Mali and Niger, for a total of over one thousand households surveyed), a model was made of the standpipe use rate for populations not connected to the public system, and the specific consumption figures at each standpipe identified. During the rainy season, there is a strong correlation between the standpipe use rate for drinking water, its selling price and the distance to be covered (these two parameters explaining approximately two-thirds of the variance).

From a strictly financial point of view, the high cost of contingent evaluation surveys (an average of Euros 25 to 30,000) could be lowered if the development of behavioural models were pursued to the point of attaining a level of predictability at least equivalent to that of direct methods. But surveys promote the consultation process, whereas the use of pre-established models promotes the concentration of decisional powers because it keeps consumers and local authorities out of the planning process.

Available data concerning the situation in the field is often incomplete and not very reliable. So called "general" household surveys effectively constitute a very useful step before beginning any new water supply and/or sanitation project. Not only do general surveys provide first hand information that is structured in relation to the specific goals of a project, they also provide the means for making a behavioural analysis to evaluate demand. The typical behaviour, practices, attitudes and opinions of households regarding the services they are provided with at the time of the survey may serve as the basis for developing possible actions.

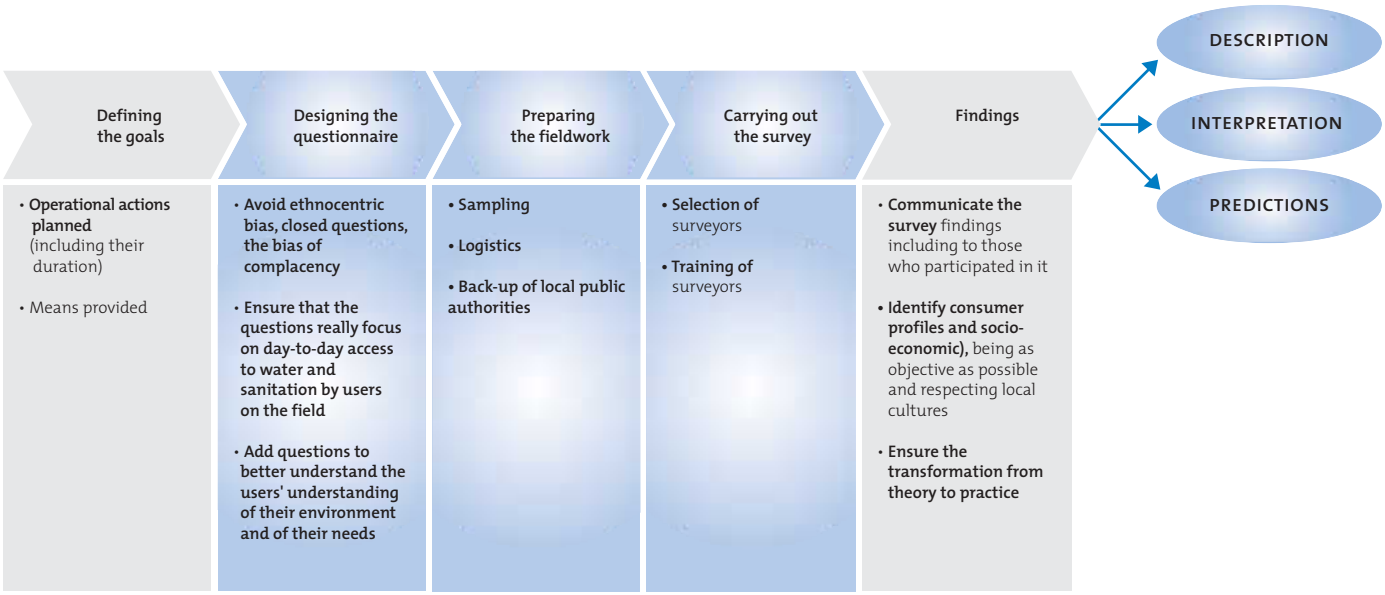
Such surveys differ from *willingness to pay* surveys because the latter can only be conducted once the main technical solutions have been defined. In fact, the basic goal of *willingness to pay* surveys is to evaluate financial efforts, or the willingness of households to work on a project to improve their living conditions. These studies consequently evaluate a *contingent* demand for services that have not yet been created. They do allow for refining the research to define a social acceptability threshold for the price of water; general surveys carried out beforehand consequently remain necessary.

To guarantee results, general household surveys should follow a precise methodology that primarily includes:

- defining the goals to be attained and the resources to be provided for the survey, including survey team training, survey financing, logistics, etc.;
- designing the questionnaire, (the structure of which will depend on the type of data to be collected);
- preparing the fieldwork, in which the sampling procedure constitutes a crucial phase because the districts and populations targeted must be very carefully defined;
- providing survey support and management (selection and training of surveyors, organization of backup on the part of local public authorities, implementation of the logistics needed, etc.);
- exploiting the findings (the way in which the data collected is to be processed must be very carefully defined).

CONVENTIONAL PROCEDURE FOR A HOUSEHOLD SURVEY

Figure 5.4



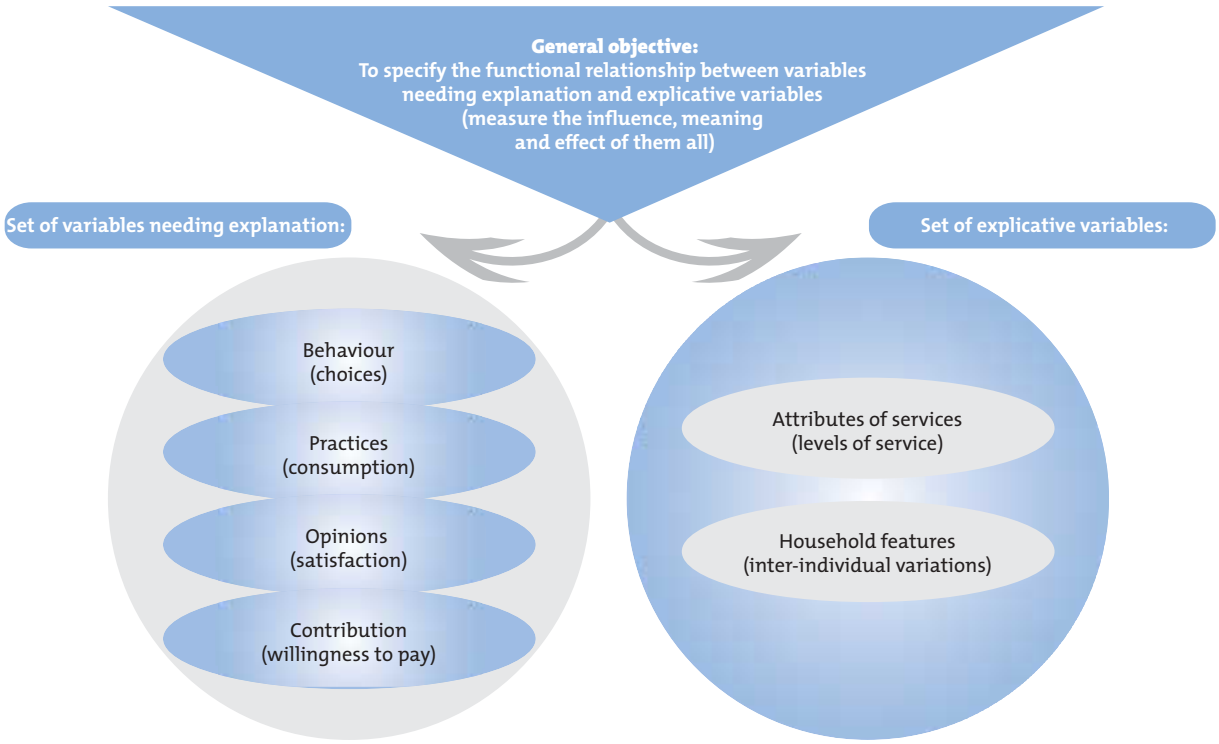
5.2 FULLY UNDERSTANDING THE DIVERSITY OF NEEDS

Demand segmentation is a method employed to more fully understand the diversity of demand functions and the profiles of the various categories of consumers. Its operational objective is to identify and rank the determinant factors of demand in order to devise the best possible offer for the various categories of potential consumers. The originality of this procedure consists in not limiting the search for determinants to an in-depth analysis of household revenue and to the price that households accept to pay for water supply, but in widening it to include what some economists call a set of attributes, i.e.:

- the attributes of water supply modes (or sanitation collection modes) and consumption types (quantities consumed, selling price, etc.);
- the socio-economic features of the households (demographic indicators, cultural references likely to explain differences in taste);
- the inter-relationship between the two (i.e. the relationship established by consumers between the factors they refer to to explain the choices they make, and their level of satisfaction).

UNDERSTANDING AND MEASURING THE LINKS BETWEEN VARIABLES NEEDING EXPLANATION AND EXPLICATIVE VARIABLES

Figure 5.5



Source: as developed by V. Verdeil (2003), 'Local water markets, water supply practices and territories in Metro Cebu, the Philippines', Doctoral thesis, Paris VIII University

Making a model of demand does not simply concern the consumption of a specific quantity of water and the price that households are willing to pay for the services associated with it. A model also incorporates the choice – and the reasons for it – of specific types of services over others, the uses of water and resulting domestic practices, and the insertion of these services into the daily lives of households. An analysis of the segmentation of water demand in regard to disadvantaged households yields pertinent findings that can be incorporated during the operational phase.

Both qualitative and quantitative evaluation methods are used to explore social and cultural phenomena, and also those phenomena related to the specific urban fabric in which the major trends brought out by the survey are present. But these methods can also be used to apply figures to these phenomena, to rank them and possibly even draft scenarios to further target the improvements to be provided.

An analysis of *exploratory* type data may suffice for understanding the motivations leading households to choose a given mode of supply over another. But making use of confirmatory model methods to further investigate the reasoning that might lead households to switch from one mode of supply to another, when an offer is either created or deleted, may provide additional information to help in decision-making. Both these methods are used to better understand phenomena and to measure operational opportunities and risks, and both are essential tools used to guide decision-making.

The goals of segmentation

Segmentation is a complex procedure. Its two basic contributions (targeting and adapting the approach) can result in a great many operational applications. The terms *typology*, *classification* and *segmentation* are often confused, even though they correspond to distinct procedures, which can be defined as follows:

- **Typology** regroups individuals by category, the individuals of a given category resembling one another in relation to descriptive variables called descriptors (sex, income level, education, beliefs and normative values, age).

- **Classification** consists in arranging individuals in pre-existent categories. Each individual in a given population is assigned to the category to which it would appear he/she is the closest.

- **Segmentation** accounts not only for descriptors, but also for the economic goal that is sought, in particular the quantity or figure consumed by each segment.

The effectiveness of segmentation depends, for example, on the differentiation of categories in relation to the economic objectives of the study. In addition, a model is made of each category to explain the relationship between estimated consumption and behavioural variables that characterize the consumer (the consumer being represented by a household in the case of water supply and sanitation services for disadvantaged urban populations). Two households belonging to the same behavioural model may thus consume very different quantities of water.

Various tools exist to perform multi-dimensional data analysis:

- For data collection and exploration, the tools used include binary categorical variables (yes/no, be connected to the system or not, get water from a standpipe or not, satisfied or dissatisfied, etc.), quantitative variables (consumption figure, monthly expenditure for water, etc.), and variables with several modalities.

- For analysis and the search for relationships among variables, the tools include factor analysis of single and multiple correspondences for qualitative variables, factor analysis of main components for qualitative variables, ranking in ascending order, discriminatory factor analysis.

- For the construction of econometric models, the analysis tools comprise logistical regression or loglinear models (logit and probit models), ordinary least squares regression (OLS) or partial least squares regression (PLS), analysis of variance and covariance, multinomial regression.

5.3 THE SETTING UP OF DIFFERENTIATED SERVICES

Once a better grasp of the situation in the field has been obtained and the principal characteristics of the household demand for water determined, the operator may look for ways – with the agreement of public authorities and local partners – to provide innovative *levels of service*. These service levels could be proposed simultaneously with modes of supply offered by local providers. Depending on the case, access is individual or shared, rationed or unlimited, continuous or discontinuous, all of which are dependent on both technical feasibility, and the administrative status of the area. Once specific constraints have been respected, a wide range of service possibilities remains. **It is however essential to remember that improving the conditions for access to water sometimes leads to changing power relationships within the community.**

Optimizing water supply service necessitates having both a macro-economic overview of the area to be supplied and in-depth knowledge of the lifestyles of the various consumer categories. At citywide level, equilibrium must be found among many factors: economic viability, the satisfaction of citizens, demographic growth and environmental safety. When household demand and income levels are too disparate within a given area, offering different *levels of service* provides a way to meet the needs and constraints characterizing each consumer subpopulation. The cost structure of each system must first be broken down according to a clearly defined grid designed to help in decision-making and in comparing the various potable water distribution systems available. At this stage an in-depth study of similar actions carried out elsewhere is very useful for understanding the potential factors for success and failure, the socio-economic context, etc.

● Durban, a pilot project (Durban has recently been renamed eThekwini)

In South Africa some three million persons live in the sprawling urban complex of Durban (KwaZulu-Natal province), which stretches over 72 km of coastline on the Indian Ocean and reaches 52 km inland. The construction of a new citywide water distribution system is an extremely costly endeavour demanding solid expertise on the part of public authorities to meet the needs of all its inhabitants from the point of view of sustainable urbanization. The differences among the types of urban services proposed to the area population are significant, primarily in regard to water supply and sanitation. It is for this reason that the municipality decided to set up three levels of service, each possessing its own tariff structure adjusted to the socio-economic profile of the consumers concerned.

THE THREE LEVELS OF SERVICE PROPOSED BY DMWS
(*Durban Metro Water Services*, the public service provider for the city of Durban in South Africa)

Figure 5.6

LEVEL 1 Full pressure system	**LEVEL 2** Semi-pressure system	**LEVEL 3** Storage tanks
• Unlimited consumption • Theoretical flow rate: 1800 l/hour/plot • Pressure measured at domestic draw offs (tap): 250 to 1200 kPa • Reticulation network cost per plot: R 990 (around USD 130) • **Cost of a branch connection: R 1200/plot (around USD 160)** • **Rigid** alignment of pipelines; pipe diameters between 50 and 150mm • Installation requiring some technical expertise, paricularly for laying pipes in trenches • Regular reading of meters • Qualified teams needed for maintenance • Supply is cut off in case of a breakdown • Tariffs defined on the basis of complete recovery of investment, operating and maintenance costs	• Unlimited consumption • Theoretical flow rate: 300 l/hour/plot • Pressure measured at domestic draw offs (tap): up to 30 kPa • Reticulation network cost per plot: R 300 (around USD 40) • **Cost of a branch connection: R 350/plot (around USD 46.50)** • **Flexible** alignment of pipelines, pipe diameters between 25 and 50mm. • Installation possible with intensive participation of local labourers • Regular reading of meters • No specific capabilities are required to ensure maintenance • No cut off in case of breakdown • Tariffs defined on the basis of partial recovery of investment, operating and maintenance costs	• Consumption limited to 200 litres/day • Theoretical flow rate: 100 l/hour/plot • Pressure measured at domestic draw-offs (tap): in function of tank • Reticulation network cost per plot: R 300 (around USD 40) • **Cost of a branch connection: R 175/plot (around USD 23)** • **Flexible** alignment of pipelines, pipe diameters between 15 and 50mm • Installation possible with intensive participation of local labourers • No meters, prepayment system • No specific capabilities are required to ensure maintenance • No cut off in case of breakdown • Tariffs defined on the basis of operating and maintenance costs only
Sanitation By a sewerage system, septic tank or storage tank	**Sanitation** By a sewerage system, septic tank or storage tank	**Sanitation** By ventilated latrines with simple pit or semi-pressure sewerage system

Source: Durban Metro Water Services (2000), Water for everyone

Forecasting models

Forecasting models are used to assess the standard cost of various water distribution systems, but making models to forecast their investment and management costs is a more difficult task with many obstacles. Potable water production and distribution costs integrate too many parameters to meet the specificities of a forecasting model. Moreover their components vary greatly in relation to technical options. Calculating system amortisement or the provisions needed for equipment renewal depends closely on national policy, which may or may not incorporate these expenses into the State budget. Experience has demonstrated that investment and renewal costs can only be estimated to within 20% of their real cost. The financial charges for loan repayment also depend on State policy in the water sector. And lastly, the cost of materials, energy, spare parts, etc. greatly depends on local market supply, and thus on the regularity of supply.

However, creating a model based on major entries is nonetheless possible and is in fact often useful for technical departments and design offices, from both an economic point of view to encourage operators to improve their performances, and from one of training, to make owners aware of the consequences of their technical choices. Based on a critical analysis of the management accounts of centres or comparable districts where a water distribution system has been in operation for several years, the reference estimates produced may constitute a very helpful aid in decision-making for both local authorities and operators.

An innovative water supply system in South African townships

In discussions on how to supply semi-urban communities with drinking water in sufficient quantity and at an affordable cost, the Business Partners for Development project participants (see Chapter 3) came up with a new supply system, the *BPD storage tank*. The 200 litre capacity, plastic potable water storage tank is installed on a simple solid steel base inside the dwelling. It is filled once a day by means of a trickle or drip type feed. The BPD storage tank system:

- eliminates the chore of going to get water by supplying each dwelling directly;
- provides a water distribution system at a lower cost which is flexible, i.e. it can either be replaced or moved to another location during urbanization and modernization of the district;
- limits the quantity of water distributed each day;
- lowers administrative costs to a minimum.

Daily consumption is limited to 200 litres by means of a ball float valve mechanism installed inside the tank. Water is transited from the supply lines (75, 100 or 150mm dia.) by reticulation through a network of small diameter plastic piping (less than 50mm dia. and in polypropylene, HDPE, or high strength PVC). The reticulation network is laid at a shallow depth along roads or pathways in the areas supplied, winding its way around obstacles where necessary. This innovative solution offers numerous advantages:

- protection of the installation, because it is located inside the dwelling, keeping it safe from theft and sabotage;
- two-point supply, with one draw off indoors and one outdoors
- constant monitoring of water consumption by the consumers themselves;
- the lowering of water contamination risks;
- the limiting of water losses by effective surveillance of the environment.

In conclusion, this system accounts for technical constraints and socio-cultural expectations at the same time, benefiting both the community and the administration supplying the service.

> The BPD storage tank; an innovative water supply system in South African townships

Wall-mounted tank inside the dwelling

Glass and fixing hooks

Wash basin and drain pipe.

Drip or trickle feed and ballvalve mechanism (positioned inside the tank)

BPD tank installation

Outdoor draw-off installed by dwelling owner

Wash unit and grey water (household wastewater) drainage trap

Figure 5.7

5.4 AN INTEGRATED APPLICATION: CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

The decisive stages in ensuring sustainable water supply are those in which close contact is made and maintained with consumers, including the inhabitants of the most disadvantaged and hardest to reach settlements. The principle itself of customer relationship management is totally foreign to populations cut off from conventional communication and information networks. Making inhabitants aware of the necessity to respect services installations and to pay the bills associated with a service is all the more complex as the result. However, providing the means to help the inhabitants themselves assume certain service management responsibilities allows for improving both the quality and the lifespan of the infrastructure.

The quality and lifespan of water supply and sanitation services largely depends on the personalized and interactive relationships established between service providers and consumers, and on the capacity of the former to listen to the latter.

Customer relationship Management or CRM is a tool devised for improving service; it is primarily designed to help:

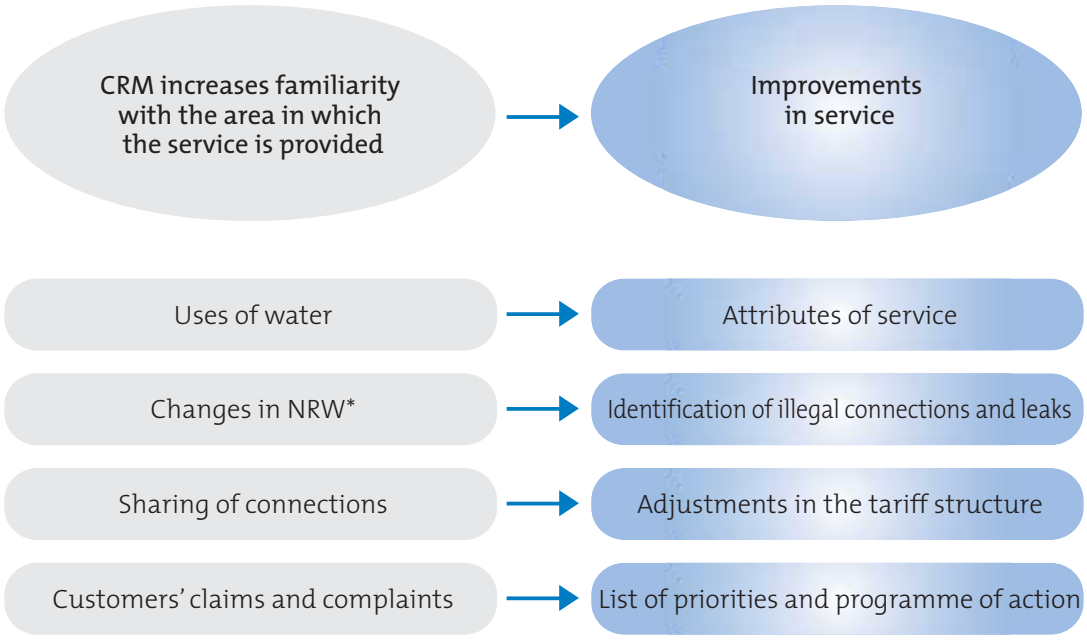
- **become acquainted with consumers on an individual basis** (their habits, their complaints);
- **identify the features of groups of similar consumers** in the area supplied;
- **spot structural trends in the development of demand** in order to meet this demand more effectively.

The basic function of a CRM tool is to select, optimize and transfer customer-related data in order to monitor and improve service. The data collected must be updated regularly to obtain databases that are easy to exploit. The effectiveness of such a tool largely depends on the reliability of the type of data collected and on the accuracy of its representation. Reliability depends, in turn, on the setting up of systematic procedures to synchronize real service improvements with data recorded by the operator's in-house management systems. The following must be determined before setting up a monitoring tool of this type:

- **the type of data to be collected;**
- **the optimal frequency for updating data;**
- **the means for data access** (reliability, rapidity, utility and cost);
- **the tool that is best suited to evaluating the data collected;**
- **the fields of application for improvement of service.**

EMPLOYING A CRM TOOL TO IMPROVE SERVICE

Figure 5.8



* NRW = Non Revenue Water (water produced but not billed, or billed but not paid)

The implementation of a customer relationship management tool requires major investment over the long term. A tool of this type must necessarily be adjustable in order to incorporate changes in the organization of the service, outside factors such as changes in the spatial development of the districts covered, new equipment and/or new systems, even changes in national regulations, etc.

● Development of a customer service department in South Africa

Before the 1994 elections, many anti-apartheid organizations publicly called for the non-payment of public services. This movement continues to block bill recovery in the old disadvantaged black townships today. Although not limited to South Africa alone, this attitude is very widespread throughout the country and requires the setting up of suitable programmes. Township inhabitants give four main reasons for their refusal to pay:

- their low incomes;
- the poor quality of the service provided;
- the lack of information concerning the service;
- the lack of communication with the supplier.

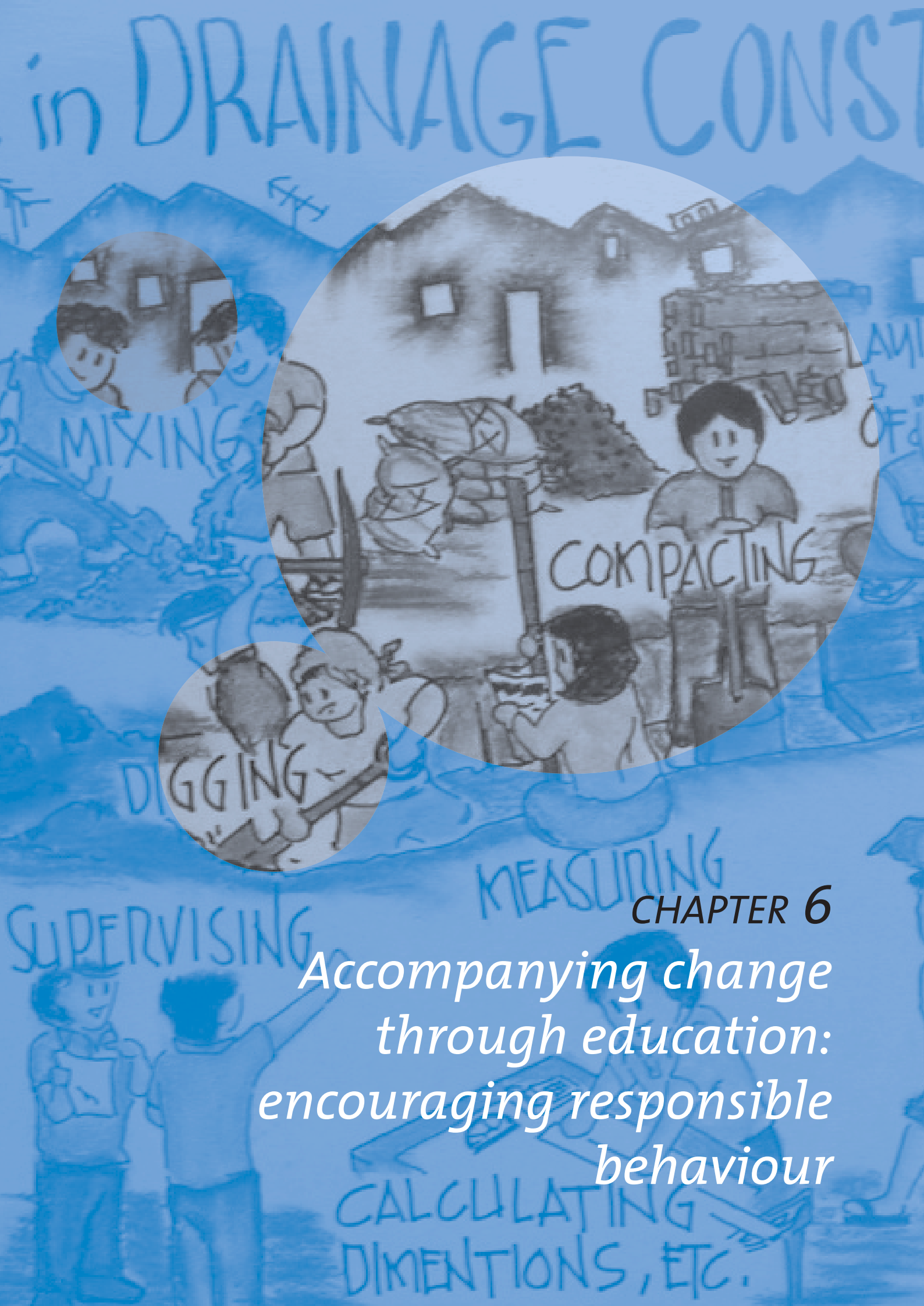
The authority responsible for water supply thus suffers from a rather negative image, which can be imputed to ignoring the needs of consumers. Customer relationship management is not very developed in general, in particular for disadvantaged consumers. In addition, there is little data available concerning the real quality of the service provided in low income areas. Three basic questions often left unanswered are:

- **The regularity of service** over the entire year.
- The measures taken to make the **payment of bills easier** for customers.
- The **average time it takes for the supplier to respond** to consumer complaints.

And yet it is in accounting for such criteria that a customer-focused relationship based on mutual benefit can be created between supplier and consumer, helping the latter come to terms with respecting the commitment to pay for the services provided. The priority objective is to determine whether or not it is possible to go beyond the *culture of non-payment* (or at least to attenuate its effects) by developing effective customer service proximity at community level. Such a project must be backed up by the recruitment and training of customer agents selected from among the inhabitants of the target areas. These agents should be in charge of organizing various social and technical activities in their community, primarily:

- educational and communication actions;
- dwelling inspections;
- setting up ways to collect data concerning leaks and network obstructions and for relaying this data to call centres, serving as an interface with such centres;
- organizing micro-projects or micro-events, concerning in particular the improvement of the standard of living, the collection of household waste, the conservation of water, etc.

The project also includes for the opening of customer service offices and for the creation of a customer charter. A customer information system is also needed so that customer agents can obtain a picture, via the GIS interface, of the spatial representation of data coming from three operational bases (system, repairs/maintenance, consumer data). **The goal of setting up a customer relationship management service to respond to the expectations of communities is to improve the relationship between the services provider (municipal department or private operator) and its customers.**



CHAPTER 6

Accompanying change through education: encouraging responsible behaviour

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Since its creation in San Francisco in June 1945, the United Nations has been the implicit vector of a civilisation safeguarding the physical and emotional unity of the human being, whose survival depends on meeting essential needs. Humans must live in an environment in which, above all else, they have access to safe water and the possibility of producing food in sufficient quantity. Once these basic necessities have been met, it then becomes possible for humans to organize their lives and live peacefully with others. As stated in the Preamble to the Constitution of UNESCO (signed in London on November 16th, 1945 by the founders of the United Nations): "since war begins in the minds of men, it is in the minds of men that the defences of peace must be constructed". ***Sustainable development is only possible in a peaceful society where education for all, for girls and boys alike, and at a very young age, promotes peace,*** *without which the equitable satisfaction of the needs of each individual, and consequently the well-being of everyone become impossible.*

It is significant that in the Preamble to its Constitution, the World Health Organization (WHO) presented the first universal definition of health in 1948, the same year as the proclamation of the Universal Declaration of Human Rights: ***'health is not merely the absence of disease or infirmity, it is a state of complete physical, mental and social well-being'.*** *This definition underlines the complexity of a phenomenon that is two-thirds water: the human being.*

Perhaps the most important outcome of the Third World Forum on Water (Kyoto, 2003) is to have established access to safe water as a fundamental human right. Even if health is considered the pivot of all sustainable development, according to the WHO, 25% of the diseases that could be avoided throughout the world are caused by environment. As stated in Chapter 6 of Agenda 21, promoting health in cities depends in particular on finding solutions to sanitary needs and on lowering the risks of pollution. Making potable water more accessible, developing sanitation systems for the collection and treatment of sewage water, and lowering atmospheric pollution are today the priorities for those who wish to improve the health of billions of persons living – or painfully surviving – in developing countries.

6.1 The impact of urban services on public health
6.2 The principal components of educational campaigns
6.3 The sustained appropriation of key messages
6.4 From health education to research and development

6.1 THE IMPACT OF URBAN SERVICES ON PUBLIC HEALTH

The impact of urban services on public health is reflected in alarming statistics. In developing countries, seven out of ten children die from five principal diseases or some combination of them: pneumonia, diarrhoea, measles, malaria and malnutrition. Three out of four children around the world examined by medical services suffer from at least one of these diseases (WHO, 2002).

The tragic cholera epidemic that struck Peru in 1991-92 causing the death of some 19,000 persons could not be stopped because of an inadequate sanitation system and insufficient chlorination of the drinking water distributed. These facts illustrate how investments designed to improve the health of populations cannot be dissociated from efforts to improve their environment, i.e. from the quality of their lives, and how such efforts constitute the first step toward sustainable development.

The effects of deteriorated environments on health will very likely increase in the next few decades. It is therefore essential to accompany the installation of technically effective urban services with educational programmes to ensure that these services are used in as responsible a manner as possible. **Investing in infrastructure to improve health and the environment is ineffective unless this effort is combined with educational campaigns to help populations understand the importance of and develop a sense of responsibility about such infrastructure.** The foremost vocation of any educational undertaking is to allow each person to develop his/her potential. Becoming aware of oneself, of one's physical and mental capacities, is a first step towards improving one's own life and that of those around one. **Projects linking an educational programme and the creation of urban services to the environment provide the means for improving well-being, and consequently health.**

Scientific and technical research and the creation of infrastructure only make sense if the targeted populations know how to use the new services effectively. Three types of action have clearly become necessary:

- informing the public about how water and health are related;
- adapting water supply and sanitation installations to local requirements;
- combating the hazardous behaviour of some consumers, an action which is closely linked to education.

By associating educational programmes for health and environmental safety with the technical service(s) provided by municipalities, water, the essential natural resource vital to the survival of everyone, can be better preserved. The association of these services with the educational sector also contributes significantly to making social headway which, along with good health, promotes sustainable development in disadvantaged areas.

Many recent studies have shown that public health improves considerably when municipal departments correctly ensure the safety and salubrity of the urban environment, and access to drinking water and sanitation in particular. In a study carried out for UNICEF, Steven A. Esrey demonstrated that all-encompassing sanitary systems lowered infantile diarrhoea by 36%, whereas simply improving the quality and/or the quantity of water distributed only lowered it by 15 to 20%.

Innovative, integrated approaches that respect cultural diversity are to be looked for to meet the sanitation needs of populations. The installation of conventional sanitation equipment similar to that used in industrialized countries is very often too costly and implies the consumption of great quantities of water. There is no universal solution, only various options adapted to specific contexts. Research carried out on the sustained management of waste and urban sanitation, financed by the French Ministry of Foreign Affairs and jointly co-ordinated by pS-Eau and the Partnership for Municipal Development, breaks down the approach to sanitation into three interrelated parts: 'The access of populations to sanitation', 'The discharge of liquid waste outside districts' and 'The treatment of liquid waste'. This approach has revealed that several solutions based on independent systems rather than on conventional sewerage systems can be associated and adapted to specific contexts. This is an alternative response to the needs and expectations of populations and to the financing capacities of countries and their inhabitants. Associated with community sanitation systems and hygiene education programmes, independent sanitation solutions can consequently become part of the planning strategy for a sanitation service covering the entire city.

Among the alternatives to conventional sanitation systems, ecological sanitation has been under study for several years. This system recommends making better use of wastewater and excreta. Based on a holistic approach and aimed at preserving the natural and social resources of communities, ecological sanitation follows natural cycles observed in ecosystems: water and waste are discharged by equipment that renders their pathogenic agents inoffensive for populations. Despite the interest of this option in terms of cost, environmental protection and even recycling, its large-scale development has yet to be tested.

The dynamic interrelationships that constitute our reality are no longer being neglected. It has been common knowledge since the Alma Ata Conference on primary health care organized jointly by the WHO and UNICEF in 1978 that educating populations in good hygiene is one of the most efficient ways to improve public health. It has thus been possible to lower by 90% some cases of Guinea worm infestation by associating the distribution of drinking water with health education and by developing hygiene and sanitation. It is now an accepted fact that a single water supply point for good quality water in a village is not enough to lower the number of cases of infantile diarrhoea because the water supplied is often contaminated between the moment it is drawn off and the moment it is used, especially if consumed.

It would be hazardous to try to improve the living conditions of a population without providing it with the knowledge needed to understand the causes of diseases, the effects of the infectious or toxic agents that provoke them and thus the relationships of cause and effect between their daily living habits and the deterioration of both their health and the environment.
Health education programmes are vital if the inhabitants of developing cities are to work together with municipal services to improve drinking water distribution and the collection of waste, and thus advance more quickly towards sustainable development. However, a new water culture

cannot be created *ex nihilo*, but must progressively develop, with respect and patience, on the basis of existing traditions and customary modes of supply and uses of water, moving towards better hygiene and improving living conditions in consequence.

> The strategic sanitation plan of Ouagadougou (SSPO): A Burkina Faso success story

The plan consists of an integrated sanitation and hygiene information programme set up by the National Water and Sanitation Office of Burkina Faso (ONEA). The programme accounts for the fact that the traditional sewerage system (the removal of waste by running water) is not necessarily the option suited to all inhabitants of the city (cultural, social and economic diversity), and has estimated that 80% of inhabitants prefer independent sanitation solutions.

Inhabitants are informed of the technical options available and negotiate a price for labour directly with the artisans specifically trained for the job. A subsidy is provided to finance the purchase of slabs and stack pipes. The promotional activities of ONEA and the subsidies for independent sanitation solutions are financed by a special tax added to the water bill. The ONEA has also signed a subcontracting agreement with a local NGO (ADRA) and a regional training centre (CREPA).

A sewerage system and facilities for treating wastewater coming from the city centre and the industrial district are also in progress. Despite problems in channeling subsidies towards the most disadvantaged populations and in negotiating with local authorities, the SSPO has allowed thousands of persons to improve their latrines and has contributed to improving sanitary installations in schools.

Source: Vézina, M., 'The strategic sanitation plan of Ouagadougou: an holistic approach to the problems of a city', Fiche l'Or bleu n°10, WSP.

Figure 6.1

6.2 KEY COMPONENTS OF EDUCATIONAL CAMPAIGNS

To effectively deploy new potable water supply and sanitation services, the factors governing water consumption habits and sanitation practices must be accounted for. When new installations do not respond to the constraints of a given environment or to the more or less clearly expressed demands of inhabitants in relation to their traditions, the chances for the cultural appropriation of the installations are lowered. The objective is of course to sensitize populations concerning the basic principles of hygiene, to show them how the new installations can be best used to protect and avoid wasting the precious water resource, while instilling simple but effective gestures designed to improve well-being on an everyday basis. But this objective can only truly be attained insofar as the community concerned is motivated and has enough confidence in itself to collectively invest in new projects.

Although it is essential to sensitize as wide an audience as possible, many WHO studies have shown that since the 1980s, public health and hygiene largely depend on the care given by women to their own families and to neighbouring families. **Sustainable development, without which the Civilization of Peace proclaimed by UNESCO cannot flourish, depends on the full participation of all social players.** All educational programmes for health and environmental safety must therefore account for the interactions between men and women, while stimulating both groups in as positive a way as possible. It's simple good sense to remember that both sexes exist in any society and that each constitutes half the human race.

Different priorities must be emphasized in relation to the context in which educational programmes are launched at the local level:

- **Creating a water culture:** in areas where water is scarce, educational programmes should be focused, for example, on developing responsible consumption while instilling the value of water as a scare resource.

- **Making populations feel responsible:** in cities where the priority is to lower water losses and improve installation maintenance, the emphasis should be placed on making consumers aware of the problem and on teaching them how to identify leaks and systematically report them.

- **Helping mentalities to change:** where sanitary conditions must be improved, educational programmes should be focused on the efficient use of sanitation systems and on the salubrity of supply points.

The launching of an educational programme is particularly delicate, because the term 'education' is sometimes used ambiguously, and this risks limiting the effective coverage of the population designed to benefit from the programme. Depending on the messages transmitted and the communication vectors selected, the word 'education' may encompass several meanings. This term may designate the promotion of ideas, practices, services and sometimes products. Some programmes are criticised as interference or because their commercial goals are more or less avowed. Adhering to a code of ethics is as necessary as precisely defining the programme objectives: is it an information campaign, a sensitization campaign or an educational programme? Taking such precautions will help consumers perceive an educational and/or a training programme primarily designed to transfer technical gestures for maintaining equipment and installations for what it is, and not as a mere communication campaign or even a purely commercial advertising campaign.

The success of an educational and training programme depends on how it is targeted. By carefully targeting consumer groups, educational messages can be adapted to the learning capacities linked to an age group, to a type of consumer and/or to specific activities of the group targeted. Thorough familiarity with and respect of the culture and family environment of the target group is therefore essential. The younger the children, the greater the chances of seeing them conserve new knowledge and of remaining faithful to the new behaviours they have been taught. Targeting the youngest groups also presents the advantage of constituting a critical social mass that will possess the political willingness later on to take action in order to improve living conditions in their country.

Illiteracy is often one of the hurdles that block the effective functioning of educational programmes. Knowing how to read and write stimulates the desire to learn. Literacy is a crucial step in opening the door to new knowledge. However, even though the significant drop in school enrolment in the 1980s has been effectively checked in Eastern and Central European countries in economic transition, disparities between the sexes are still very significant in Latin America, the Caribbean Islands, Southeast Asia, the islands of the Pacific and in more than half of African countries, including some of the poorest.

The benefits of the availability and uses of water are perceived differently by men and women. There are two major reasons for this: firstly, disparities in the basic education of the respective sexes, and secondly, the different ways in which each sex makes use of water.

According to an evaluation carried out in 2000 by UNESCO in over 180 countries, 84% of men are literate whereas only 71% of women know how to read and write worldwide. These statistics rather faithfully reflect those revealing that in developing countries nearly 86% of boys attend school, compared to 78% of girls. Studies carried out by UNESCO have shown for a long time now that educating girls is a key to sustainable development. When a girl becomes an adult and the head of the family falls sick, the entire future of the family is likely to be affected. Even though the role of women in supplying and using water resources was identified and recognized during the *International Decade of Potable Water and Sanitation* (1981-1990), nothing has changed. Concrete training with a specific focus must be offered to schoolgirls and women by Water Committees or by other associative structures in the district. As soon as they enter primary school, girls can learn how to manage the water resources and sanitation systems of their community, following the principles of the *World Initiative for Health at School*, a programme launched by the WHO, UNESCO and UNICEF in 1995.

Women need water close to home for domestic chores and for their food crops, and primarily in Sub-Saharan Africa where, of the 70% of crop growers who are small operators, 85% are women. Women produce 60 to 80% of all food for the African population; they also raise 50% of all herds and sell 60% of all agricultural products. African women do twice the work of men, in particular in raising irrigated crops. Women and the children who help them in the irrigated fields are consequently doubly exposed to water-related infectious diseases when compared to men. And yet men usually have control of water resources. Because they are not themselves exposed to the risks often associated with insufficient sanitation, they cannot assess all the dangers. **The supply of safe water is a need felt as much by men as by women but in a different manner, and this generates inter-generational habits that are difficult to change with any rapidity when populations flow towards the peripheries of major cities in the hope of improving the quality of their lives.**

An educational project must first begin with the preparation of a plan of work. The work plan, set up phase by phase, fulfils several functions. Firstly it provides transparency, which serves to reassure . It allows all those who are involved in the project to better understand why the project has been undertaken. And subsequently a work plan helps in distributing tasks as efficiently as possible while avoiding needless duplication. Finally, the plan makes it easier to identify resources and constraints.

The problems encountered in translating ideas, actions and objects from a vernacular tongue or provincial dialect to a more widely used language often make it necessary to resort to visual aids to teach populations new gestures and new practices, using strong images from the local culture. **Training and educational materials drafted in a language accessible to everyone are still very hard to come by, but this can be a good thing since it provides the opportunity for creating new materials on bases that are more complete and fairer to women, i.e. to that part of the population so often forgotten by hydrologists, engineers and decision-makers.** Many executives still do not know enough about the real needs and feelings of women, and especially those of the less fortunate, nor about the constraints they are faced with in their day-to-day existence – an existance that is often precarious, especially in certain areas and cities of Sub-Saharan Africa. The lack of women executives explains why such serious gaps remain and also why women must participate on an equal footing with men in making decisions concerning water management and educational and training programmes.

In some communities knowledge is transferred in writing, in others knowledge transfer is oral. But today, both methods often go hand in hand. Religious and spiritual beliefs, normative values and moral principles, the attitude to be adopted in relation to various members of the community and consequently socially acceptable behaviour, the methods of acquiring and preparing food, and various crafts that use water (basketwork, pottery, etc.) are all transferred orally and visually, and even by touch. **This form of education should not be neglected because it often possesses an important sacred dimension for populations who have not abandoned their beliefs and ancestral rituals.** Moreover, this form of knowledge transfer – which from childhood gives a feeling of belonging to one's community, along with a feeling of accomplishment and a cultural identity – may strengthen community solidarity in a population of rural origin that has come to lose itself in the big city. And lastly, the normative values of a population are more apparent and take on a clearer meaning when its oral culture, cosmogony, myths, legends and tales are studied. Indeed, these values are not necessarily expressed in any direct way during meetings attended by technicians and hydrologists and the administrative authorities of a city.

Environmental and health education is all the more fruitful when it is anchored in the local culture, accounts for the specific problems of the population, and integrates traditions and practices which, in major cities, may vary from one district to another depending on the ethnic groups who live there. It is thus very important to devise communication tools and ways of formulating ideas to ensure that the messages for the population concerned are in fact accessible.

The success of such programmes depends as much on the choice of media (radio, the press, posters, etc.) as on the messages themselves and on their references to local cultures. Whatever the means employed, messages must be expressed in as clear a manner as possible and thus as simply as possible while remaining valid from a scientific and technical standpoint. But 'simple' does not mean 'simplistic'. It is often hard to express rather complex ideas in clear terms and avoid professional jargon at the same time. **The help of a local journalist, teacher, sage, priest or marabout may be very useful in preparing messages corresponding to models that form part of the daily lives of the population as expressed in ballads, tales, proverbs, songs, rhymes, fables and stories that speak to adults and children alike.**

Nothing replaces personal experience in memorizing something new. And knowing that what one has just learned can be quickly put into practice is very motivating. Education in general and technical apprenticeship through actual experience in particular also present another advantage for

women: they allow women to discover the existence of activities such as the construction of pumps, water supply equipment, latrines or equipment maintenance, encouraging them to take up a money-making activity, and breaking down the barrier of isolation in which the vicious circle of poverty has kept them.

Environmental and health education in developing countries

In the past few years, Veolia Environnement teams working in the field have often become involved in educational initiatives aimed at improving, through knowledge transfer, the efficiency of the services provided (potable water distribution, sanitation, and the collection of waste in particular). Working in proximity to local populations, these teams have become aware of the sometimes harsh reality of their needs, and this is an essential dimension of their work.

These educational initiatives have been designed and set up in partnership with local authorities, Non-Governmental Organizations (NGOs), and of course the consumer communities. NGOs working in the field, along with cooperatives and women's associations, make up an important part of the human, technical and financial resources that contribute to developing and popularizing environmental and health education. **Such associative entities are usually more familiar with the situation in the field, with the day-to-day lives of populations, with their problems and their needs than are administrators and municipal advisors, most of whom, unfortunately, are men.** These groups must therefore be invited to participate in the preparation and planning of educational projects, which basically cover three major fields:

- **The proper utilization of services:** in Chennai (India), an information campaign was carried out to teach the population how to use and maintain garbage cans in the street.

- **The promotion of health and hygiene:** in Durban (South Africa, a city that recently recovered its Zulu name, eThekwini), the NGOs involved in educational actions taught good hygienic practices to both schoolteachers and students, primarily by employing the PHAST method *(Participatory Hygiene and Sanitation Transformation, see below)*.

- **The preservation of natural resources:** in Aguascalientes (Mexico), a social communication campaign focused on the importance of preserving water resources was launched. In order to spread the message as widely as possible in schools, children were elected "water guardians" during the campaign.

The spreading of key messages during educational campaigns such as these will be all the greater if they are backed by cooperative efforts on the part of local media, and primarily by radio and television. State-owned public radio stations now cover the quasi totality of countries. In Africa, the radio remains the principal means of information and mass communication.

The ideal would be to combine mass communication methods with person-to-person communication. The creation of events promoting direct interchanges between trainers and trainees, such as workshops, seminars, festive events, street theatre, puppet theatre, helps promote communication between the two. For example, communication based on interchange allows trainers to further detail certain important points or to calm doubts or fears expressed by the trainees. And these methods very profitably replace radio and television broadcasts where electrical equipment is insufficient and where generators, accumulators and batteries are too costly.

The PHAST method: global improvement of hygiene – sanitation

In 1993, The World Health Organization and the regional group for water supply and sanitation in southern and eastern African countries (RWSG-ESA) developed the PHAST method in an attempt to go beyond traditional communication methods employed in hygiene sensitization campaigns. PHAST *(Participatory Hygiene And Sanitation Transformation)* establishes a new methodology designed to promote hygiene and the participation of communities in water supply and sanitation projects. The goal of PHAST is to limit diseases linked to the lack of sanitation by helping populations progressively identify and resolve problems in this field by themselves. **The principle consists of developing community awareness and comprehension of health hazards in order to adapt practices and behaviour to local needs.** The participation techniques employed are based on simple visual aids and on focus groups whose task is to come up with a plan of action at the level of the community.

The success of PHAST projects directly depends on the quality of the teams recruited and in particular on their leadership capabilities. Both 'facilitators' and coordinators are trained according to these criteria to accompany the community during the four main phases of the project. The previous experience of these teams with this type of action, and their ability to establish real dialogue with the population is determinant.

> Educational posters

Figure 6.2

Team members must be selected in relation to their knowledge of dialects and local cultures. PHAST projects imply that the municipal directors in charge of the environment and health are themselves aware of the simple gestures to be learned and of the practices to be banned. Health practitioners – namely midwives and traditional healers or tradipraticians – are trained in the principles and rules of modern hygiene following the recommendations set forth by the WHO thirty years ago. Each project is structured in four successive phases: identification of problems, the planning of actions, their implementation and the evaluation of results.

The method makes use of simple visual aids (drawings, cartoons, photos, posters, folders, etc.) because they are easy to make and inexpensive. Visual aids should be such that the population identifies with them, for instance by representing daily practices, and should allow the population to recognize its environment, for example by representing a map of the district. Each person or each group entrusted with implementing a PHAST project is in charge of designing his/her/their own visual aids, and with promoting and stimulating the community to help make them. One of the basic principles of the PHAST method consists in using drawings and painting as a means of expression. Visual perception stimulates globalization and synthesis skills, a phenomenon known by neurologists by the term "syncretic perception". Another advantage of this method is that it helps inhabitants to better understand and interpret the urban setting in which they live. And for women who don't have the time to come to educational meetings or who do not know how to read or write, visual aids will help them feel included in the community educational process. When the reason for changing practices is not understood, change is rarely produced, especially when poverty combines with ignorance.

The purpose of the evaluation phase is to identify the principle stumbling blocks encountered during the project and to assess the participation of volunteers and partners alike, how deadlines were respected, what the population learned, and what concrete technical achievements were made. This phase also includes evaluating whether or not the goals set for the project have been attained in a sufficiently precise manner to reflect the real needs of the community, and whether or not concrete responses have been made to meet these needs. Asking trainees the following questions helps in this evaluation – Has the number of participants increased? How many persons now understand all the benefits resulting from using safe water? How much time do family members in charge of water supply save each day? How is this spare time used? Has the number of cases of diarrhoea decreased, by how many and in which families?

The ongoing progress of an educational project can be checked by performing a bi-weekly evaluation or at a minimum, a monthly evaluation. This allows for making changes in activities to improve results. The purpose of such projects is not just to change old practices and behaviour in regard to water. The end goal is to empower the population so that it can design, implement and manage projects on its own. **Giving a population the means to act on its own is the very basis of all sustainable development, in particular in areas where major water crises are common (flooding and/or droughts).** The less a person feels dependent on an abstract authority, (without suffering from a feeling of exclusion, of course!), the greater becomes his/her capacity to adapt to new situations and the more his/her spirit of initiative develops to confront complex problems.

The PHAST method is usually employed in rural areas. Its application in an urban setting may require taking specific precautions, for the following reasons:

- Community volunteers often demand to be paid, even before they have taken the introductory courses;
- Conflicts of interest are exacerbated: this is the reason some groups sometimes look for ways to compromise or delay a project;
- Types of representation are more diversified in an urban setting. Several leaders may claim authority over the community and demand to be consulted on a regular basis, thus multiplying the risks of undermining the project;
- The proximity between political leaders and the population intensifies the impact of electoral life on projects, and the likelihood of seeing projects diverted to purely political ends.

6.3 THE SUSTAINED APPROPRIATION OF KEY MESSAGES

Social justice, human dignity, respect of the environment and the transparency of both administrative and financial decisions constitute the ethical bases without which it is practically impossible to lay the foundations for sustainable development and thus ensure the future of young generations. The management of water resources no longer depends solely on scientific knowledge and technical know-how. It is now part of an overall, holistic approach, one which accounts for normative values such as social equality, cultural diversity and in particular the respect of the traditional cultures of unindustrialized populations. Indeed, these cultures spring from the adaptations of local populations to their specific environment, and are often very ancient. **This new approach to management encourages dialogue and discussion, justice and fairness, without which democracy and sustainable development cannot exist.** Mr. Boutros Boutros Ghali, ex-general secretary of the UN, stresses this point in his foreword to *The Interaction between Democracy and Development*: "The absence of justice directly compromises development because it encourages laid back management and corruption, both of which discourage economic exchanges." (Boutros Ghali & Al., '*The Interaction between Democracy and Development*', Paris, UNESCO 2002).

The joint development efforts of the various parties involved in water management, and in environmental and natural resource management in general, are more or less implicitly geared to encouraging all social players to actively participate in shaping their own destiny. And fair and active participation, the key to any sustainable democracy, is based on equality of the sexes. Paving the way for gender equality must be an integral part of all educational programmes for all ages, starting with nursery school.

A guide to best practices in health education

In October 2001, Veolia Environnement prepared a guide to best practices in health education for its teams working around the world. The guide, prepared under the aegis of the Veolia Environmental Institute, provides a framework for implementing educational projects in partnership with operators, municipalities, urban populations and NGOs in developing countries. The guide basically covers:

- A description of the health-related and environmental features of urban services.
- An evaluation of determinant social, economic, cultural, behavioural and environmental factors in designing and implementing an educational project.
- Recommendations concerning the methodology to be employed in setting up educational programmes and their management, in particular to ensure liaisons between public and non-governmental partners.
- A review of various educational methods adapted to needs encountered in the field.
- Proposals for qualitative and quantitative indicators that can be used to evaluate an educational programme as it progresses, as well as its impact on health and the environment.

Project evaluation is performed by interviewing those involved in the project: educators, NGO directors, representatives of consumer families, community leaders and of course the suppliers and operators themselves. The best practices guide is designed to help strengthen the sustainability of the services provided and to promote the well-being and health of the populations supplied. It is also designed to stimulate creativity on the part of populations, their sense of responsibility, and their spirit of enterprise and initiative.

A society without a project, without a 'dream', is a society without a future. Although education is not an end in itself, the outlook for innovation is not very promising if knowledge is not shared. But when an educational project at a municipal, regional or national level encourages the creativity of citizens and allows them to participate in the decisions that affect their future, this opens the way for research and development, and for innovation, which in turn can improve the quality of life for everyone.

6.4 FROM HEALTH EDUCATION TO RESEARCH AND DEVELOPMENT

The World Science Forum held in Budapest in 1999 identified the features of an educational programme truly designed for building the capacities of populations, and in so doing the competitiveness of a country. These features are essentially:

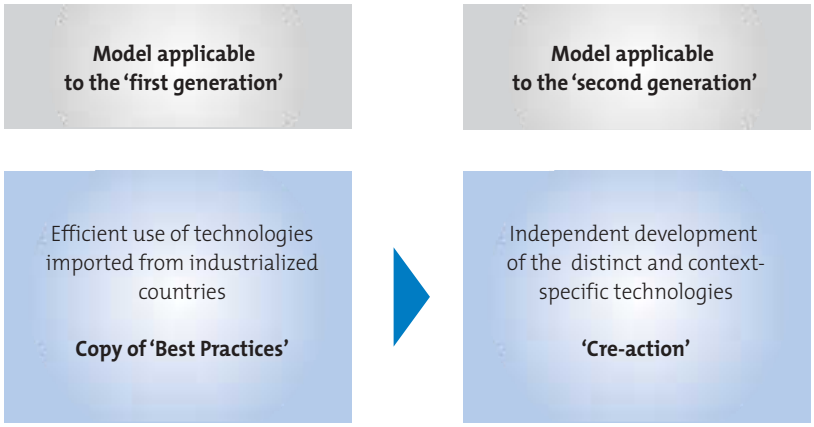
- **Stimulating the independence of universities and their capacity for action** (by setting aside funds for research, for example);
- **Encouraging the active participation of trainees,** for instance by organizing interactive seminars for trainees, researchers and entrepreneurs so they can share their respective points of view on the world of today and tomorrow, and also their experience;
- **Improving the quality of teaching and opening up the material taught to encompass leading-edge scientific and technological discoveries,** while encouraging creativity by allowing some freedom for exploration. This provides the means for learning how to manage complexity with humility, based on the principle that no one knows it all;

- **Steering the university towards becoming both a research and training centre solidly linked to its social and economic environment.** The *triple helix* approach is based on the interactions of governments, businesses and universities, which are stimulated by organizing roundtables at national or regional level. Promoting and stimulating the synergy needed, the triple helix approach helps these three sectors define the national priorities for scientific and technical research together and in harmony.

MODELS FOR KNOWLEDGE TRANSFER AND DEVELOPMENT IN NON-INDUSTRIALIZED COUNTRIES

Source: UNESCO Paris (2001), Best Practice in Science and Technology

Figure 6.3



Whether concerning basic education in districts or advanced learning in universities, any training project must be allowed to become a centre of excellence with recognized capabilities in order to receive aid from the public sector (municipality or government institution).

These are the essential bases for building the research and development capacity of a country. However, a few precautions of an ethical nature should be taken. **A partnership between the educational and research sector on one hand, and the public and industrial sector on the other must be based on contacts rather than contracts, and on programmes rather than projects.** What's important is that a procedure for exchange is set up between these two worlds, one that goes in both directions, as with any real communication. But this communication is not always easy because each of these worlds possesses its own language and specific goals.

Defining long-term goals implies granting importance to the factor 'time' in examining and discussing measures designed to create economic goods and social well-being through science and technology. In developing regions, the entities responsible for education must ask the following questions so as to evaluate the effectiveness of what is taught:

- Do both the scientific and manufacturing sectors allow innovators to transform their theories into practical applications?

- Does legislation really protect innovations?

- Do administrative, legal and financial plans allow the manufacturing sector to move from imitation to innovation?

- Has the educational system been developed according to international criteria?

It is not enough to show interest in youth and give them priority access to the learning process. Interest must be shown to all persons at all levels who may be without third level qualifications, but who are rich in promising projects. These persons must be integrated both socially and professionally by means of ongoing local, regional and/or national processes in order to create a society eager to learn and to maintain a social dynamic based on democracy. Maintaining a social dynamic means providing continuous training, sharing and transferring knowledge, continuously investing in research and technology and ensuring the transparency of decisions, combined with the political determination to see them become reality.

Education must meet the double challenge of developing citizenship by upholding a system of ethical and cultural values while preparing populations for their entry into the information era.

CONCLUSION

CONCLUSION

Regular access to safe and potable water and to a sanitation system for wastewater discharge is essential for preserving human dignity and safety and for attaining decent living conditions, especially in densely populated urban centres.

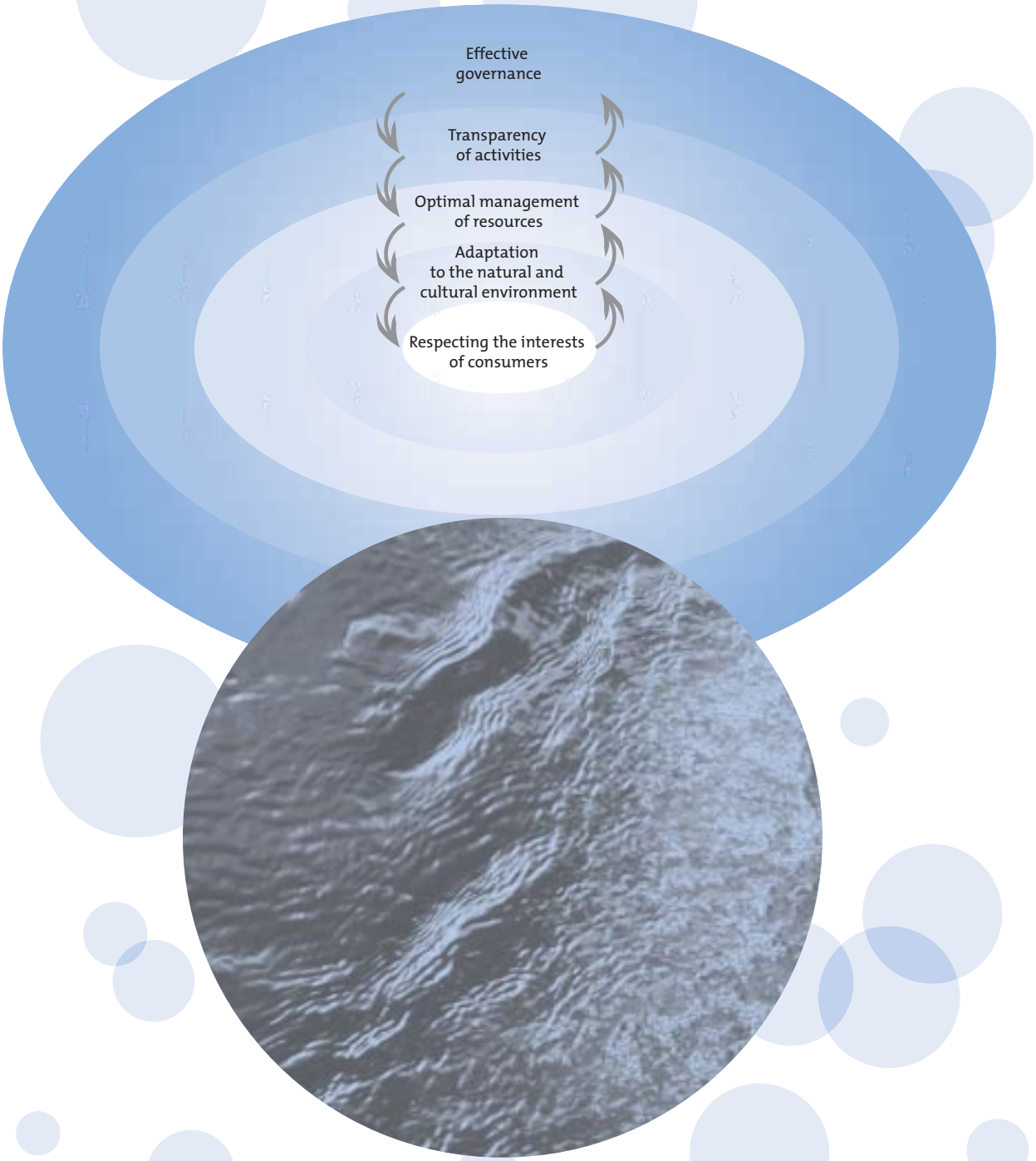
Beyond the universal right to access a water resource when it is available in the surrounding milieu, the installation and day-to-day operation of water supply and sanitation services rely on a range of skills. Such services are both highly technological and capitalistic activities.

To better ensure maintenance, renewal and modernization of the infrastructure needed to efficiently deliver these services to consumers, the following **ethical principles for water and sanitation must be observed:**

- **Effective governance** among all the parties involved (the equitable sharing of responsibility, resources and risk in relation to the respective prerogatives and capabilities of each partner).
- **The transparency of activities**, both public and private (respecting the principle of information transfer and of making basic data regularly available to the population).
- **The optimal management of all available resources:** natural resources (combating unnecessary waste), human resources (training), financial resources (packages adapted to the context), technological resources (research and development).
- **Adaptation to the local natural and cultural environment** (by selecting both the partners and the techniques that will guarantee the sustainability of the solutions provided).
- **The respect of consumer interests at all times:** consumers must be consulted for each decision, but without replacing water sector professionals when technical recommendations are required.

Major ethical principles for water and sanitation must be respected if effective governance based on sustainable development at the level of each city and each human community is to be achieved. The challenge is consequential, not only for developing countries, but for industrialized countries as well.

THE 5 MAJOR PRINCIPLES OF A UNIVERSAL ETHIC FOR WATER SUPPLY AND SANITATION



COMMITMENT CHARTER FOR ACCESS TO WATER AND SANITATION

"WATER: AN ESSENTIAL RESOURCE FOR SUSTAINABLE DEVELOPMENT"
(Document presented by French participants in the World Summit on Sustainable Development held in Johannesburg in August-September, 2002)

The presentation of this document by the French participants during the Johannesburg World Summit on Sustainable Development bears witness to their commitment to actively contribute to improving access to water supply and sanitation services for all populations in developing regions.

Foreword

Satisfying essential needs, health, food safety, and sustainable development: water plays a crucial role in each of these areas. By freeing men and women from the worry of procuring an adequate supply, access to water represents a basic element for economic and cultural development. The working group on water has therefore drawn up several recommendations, following on from the draft declaration on guaranteed access to essential services. All of these recommendations have one objective: to increase access to water and sanitation. The General Assembly of the United Nations has set itself the objective of **reducing the population that does not have access to clean water or that does not have the resources to obtain it by one-half by the year 2015** *(Millennium Declaration)*. Access to water is intrinsically linked with access to sanitation, which is why the Ministerial Conference at Bonn **extended this objective to cover sanitation** which has a decisive impact on human health and the preservation of ecosystems.

The Secretary General of the United Nations established a framework for Johannesburg, the aim of which was to ensure the fulfilment of the objective set in the Millennium Declaration. It is clear that **the success of this world-scale project depends on the involvement of all stakeholders: governments, local authorities, consumers, NGOs, operators and financial backers, among others**. For us, access to drinking water and sanitation is an inalienable human right that we all have a duty to guarantee. We have therefore decided to **make a commitment to work together in order to define the steps that need to be taken to achieve the objective set by the Millennium Declaration**, and the conditions required for the efficient operation of water and sanitation services, as well as to ensure that these efforts are not in vain, in particular in developing countries.

Developed countries have a **duty to respect the inalienable rights** of developing countries in order to achieve the objectives set in the Millennium Declaration. This solidarity takes various forms: multilateral or bilateral assistance, decentralized cooperation, and solidarity actions on the part of individuals, associations and companies. There has, however, been a considerable decrease in North-South solidarity in relation to water since 1996, in particular with regard to Africa. If objectives are to be achieved, it will require significant increases in the sums raised and more efficient use of this assistance.

The right of access to water and sanitation services represents **a collective interest** and also contributes toward the prosperity of local economic and social structures. All players in the developed countries must ensure the development of local skills with a view to forming equitable partnerships. Assistance networks must contribute toward **education, strengthening local capabilities**, and exchanging data and information by means of personalized partnerships.

Our approach is based on r**especting the diversity of local situations and a concern for sustainable development**. We wish to promote and share this commitment – which involves us all – by means of this declaration, which we put forward for debate and discussion. We have set ourselves the objective of preparing a final version of the text for the next World Water Forum at Kyoto in 2003.

● Chapter 1: basic principles

Right to water and sanitation

Access to drinking water and sanitation is an inalienable human right, which we all have a duty to ensure. Public authorities are charged with guaranteeing that their entire population enjoys this right.

Protecting resources

Water resources are our heritage and must be safeguarded as such. Protecting this resource is a goal that serves the collective interest; it cannot be the subject of private appropriation.[1]

Serving the collective interest

Drinking water supplies and sanitation are collective interest services. At a local level, these services must comply with the principle of equality of treatment and contribute toward social and regional solidarity; they must be organized efficiently, in order to guarantee real access to water and sanitation; and their funding must be sustainable. It is essential that public authorities retain control of infrastructures (pumping stations and purification plants) and the main public networks; it is preferable that they in fact retain ownership of these elements.

Governance – transparency

The involvement of all parties concerned contributes to the performance of services. This involvement is based on the principles of transparent public decisions[2] and representative and participative democracy.

Ethics

Making suitable choices in terms of organization, mobilizing partners, and the smooth operation of financial mechanisms presupposes compliance with aims relating to collective interests, controlling the allocation of public resources, in particular financial resources, and rejecting all forms of corruption, at all levels and regardless of the method used to organize the services.

[1] *"Human activities are having an increasing impact on the integrity of ecosystems that provide essential resources and services for human well being and economic activities. Managing the natural resources base in a sustainable and integrated manner is essential for sustainable development." (Draft chairman's text, Item 21)*

[2] *"Facilitate access to public information and participation at all levels in support of policy and decision-making related to water resources management and project implementation as well as empower women" (Draft chairman's text, Item 22b)*

Mobilizing stakeholders

The amount of the investments and the technical expertise required presupposes the mobilization of all available resources, and, if necessary, the use of multi-player partnerships between public authorities, private and public sector companies, and civil society.[3,4]

Solidarity

In view of the unequal distribution of resources, income, and population, access to water and sanitation requires local, national, and international solidarity mechanisms.

● Chapter 2: role of the public authorities

Developing water and sanitation services requires a strong public authority and, in particular:

- **A governing authority that sets the general framework:** this authority, which is recognized by consumers, can only be the government;

- **Authorities to organize the services:** in view of the cost of transporting water and the need for local management in close contact with users, the authorities that organize the services must be those that are the closest to the field. In the majority of cases, therefore, this involves the **local public authorities**; the reality behind this picture may vary depending on the country in question.

These authorities cooperate closely with each other and with **civil society** for all decisions.

Role of the state

The State acts in all of its areas of jurisdiction – legal framework, power structures, mobilizing financial resources, and the setting up of national programmes and solidarity mechanisms – to **positively promote access to water and sanitation for all**. It plans **to reduce the population that does not have access to clean water or that does not have the resources to obtain it by one-half by the year 2015**, and organizes actions to further this aim. It measures this number regularly and puts this information in the public domain, thereby evaluating the results of the policies pursued in relation to access to water and sanitation. It sets the general framework for **integrated management** of resources on a scale that guarantees equitable distribution among the different categories of consumer, with a view to sustainable development, in cooperation with other countries if required. National and international **drainage basins** are natural places for meetings, confrontation and solidarity among the different categories of water consumer. It establishes **rules of law** and, if required, regulatory systems, in order to:

[3] Recommendation no. 16 from the International Conference at Bonn, December 2000: "In view of the scale of investments to be made in infrastructures, we must mobilize private funds to supplement the public funding set aside for water distribution, water purification, and irrigation services, and for other programmes related to water. Public-private partnerships could be established, on the understanding that private management of distribution services does not involve private ownership of water resources."

[4] *Mobilise international and domestic financial resources at all levels and transfer of technology and capacity-building for water and sanitation infrastructure and services development, ensuring that such infrastructure and services meet the needs of the poor and are gender-sensitive. (Draft chairman's text, Item 22a)*

- Guarantee lasting protection of water resources and ecosystems by means of an **authorization system** for withdrawals and emissions and a system of ***organized monitoring*** **of water**, or by means of any other appropriate system for protecting water catchments, managing concentrated or diffused emissions and ground impermeability, taking water into consideration in plans for land use, and so on.

- Facilitate the development of water and sanitation services. This stable legal framework, which complies with international regulations, must, on the one hand, guarantee the freedom and reversibility of local authority decisions relating to the organization of services and, on the other, ensure the security of public and private investments.

- It ensures the smooth operation of **networks for measuring** and monitoring water resources (rain, surface and ground water) and sees to it that they are mutually compatible and comply with international benchmarks. The State sets up consultative and evaluative mechanisms that **guarantee civil society immediate access to information and means of appeal** against any illegal practices; it also ensures that consumers are protected against unreasonable practices. It establishes **support facilities** that ensure the access of the organizing authorities to independent technical skills, in particular for placing and monitoring contracts.

The role of the authorities organizing the services[5]

The task of the authorities organizing the services is to guarantee access to water and sanitation for all. They finalize the **programmes** and timetables for improving water and sanitation services put forward in participative meetings; they then **publish** these decisions. The authorities give **real substance, adapted to suit the local situation[6], to the concept of access to water and sanitation,** while complying with the general principles of equality of treatment and solidarity. They set a limit between the essential service and any complementary services that may be available in addition to this. They set prices that are as close as possible to costs **(water pays for water)**, and which, as a minimum, cover the costs of operating the service and are in line with programmes for improving the services. The authorities ensure that these prices:

- **Are tailored to the financial capacity** of the populations, making use, if required, of the appropriate social provisions, of solidarity mechanisms on another scale (regional, national or international drainage basins), or, failing this, of mechanisms for financial compensation among regions and categories of consumer;

- **Promote responsible use of water** by applying the "polluter pays" and "user pays" principles, possibly on the basis of charges that are redistributed to projects that encourage:

1. The prevention of risks relating to activities, both for residents and for the receiving environments,
2. The polluter to remove pollution and the consumer to avoid wastage.

[5] The organizing authorities are, in the majority of cases, the local public authorities.

[6] The concept of access to water can cover different realities, depending on the place and time:
- Eg. 1: water can be accessed via public distribution points; provision to the home is an "added" service.
- Eg. 2: the "right of access to water" may be different for second homes.

The authorities are **free to choose from between among management methods:** state control, public bodies, or contracting management to a private or public sector operator or to an association. They re-examine their choice at regular intervals, on the basis of objective elements for comparison and evaluation. They can change the management method within the constraints of any contractual commitments. Whatever organizational method is selected, the authorities that organize the service are responsible for the service; they therefore ensure that they have the required resources to allow **true control** and ensure the transparency of the information supplied to consumers on the price of the services, the quality of the water distributed, their development strategy, and, if applicable, the tasks entrusted to operators. They protect consumers' rights by regulating the service and via other systems employed. If they decide to entrust the operation of the service to a public or private sector operator, they must guarantee that there is **real competition** between operators. Favouring a contractual approach, they use incentives and penalties to encourage compliance with aims relating to the long-term collective interest.

Chapter 3: contributions from partners

The contribution of civil society

Alongside elected officials, user-citizens and other categories of consumer, employees, and associations play a vital role in defining, organizing, evaluating and managing services. This calls for actions aimed at training and raising the awareness of consumers and citizens. These groups play a decisive role in the struggle to comply with collective-interest aims and the battle against corruption and conflicts of interest; they actively contribute toward better dissemination of information and true consumer participation. In all projects, such groups ensure that provisions have been explicitly made to help consumers and local authorities express their needs and requirements and to encourage the authorities that organize the service – and, if applicable, the operators – to consider the situation of each category of user.

The contribution of the operators

While respecting the pre-eminence of the public authorities, private and public sector operators implement the resources required to achieve the objectives set by the organizing authority.

They mobilize financial, technical and human resources and expertise, in partnership with the authorities that have opted for this method of organization. In view of the crucial importance of access to water, and subject to the existence of equitable means of appeal, **operators** guarantee the **continuity of the service as set out in the contract**. They consider the **long-term implications**, whether these relate to the sustainability of the service or protecting the environment, and this includes doing so beyond the expiry date of the contract. They ensure that consumers and the organizing authority benefit from technical innovations, and guarantee the development of local skills (the training of local players, and so on); they also call on local industries and tradesmen with a view to forming **equitable partnerships**.

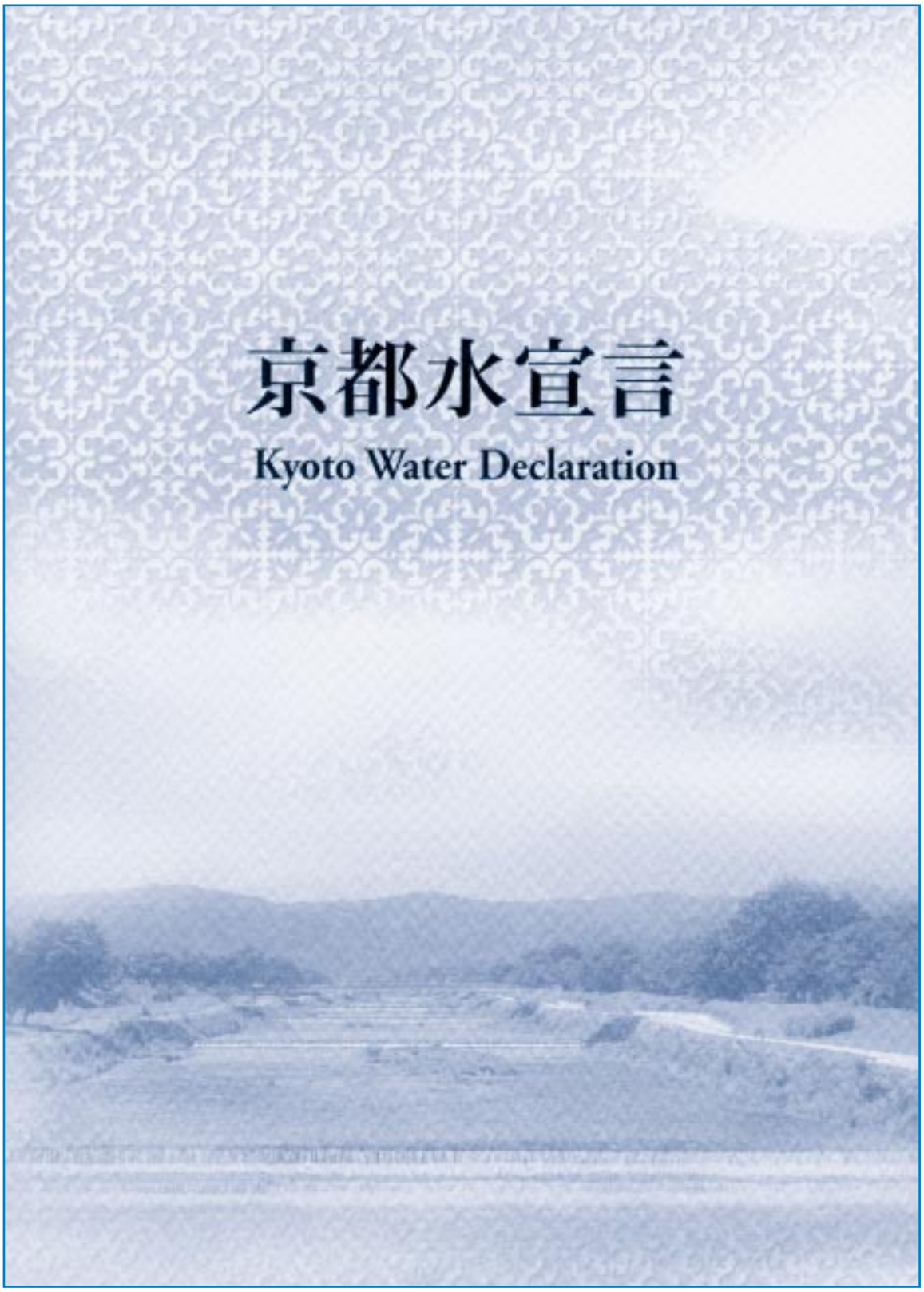
The contribution of financial backers

Financial backers contribute toward mobilizing capital for access to water and sanitation in developing countries. They take a long-term view, favouring projects that:

- Contribute toward ensuring sustainable access to water and sanitation for the entire population;
- Maximize the efficiency of public assistance for development;
- Support local project managers and provide them with the resources required to manage their services and any outsourced contracts.

They combine their assistance with support in establishing a suitable institutional framework.

KYOTO WATER DECLARATION



Kyoto Water Declaration

We are greatly pleased that the 3rd World Water Forum has convened here in Kyoto, where the Kyoto Protocol — which sets forth specific targets for addressing global warming — was adopted. This Forum is dealing with a wide array of water-related problems and is encouraging those linked through water around the world to take action toward these problems.

First, we have confirmed that environmentally conscious lifestyles should be promoted in order to preserve the water cycle on the globe, to ensure all have equal access to at least the minimum necessary amount of water, and to contribute to the perpetual sustainability of ecosystems around the world.

The world's water-related problems encompass water pollution, ecosystem destruction, floods and droughts as well as a lack of safe drinking water and access to sanitary facilities. While these problems are due to the impacts of climate change as well as existing production and consumption patterns to some extent, they are also deeply rooted in regional social cultures and geographical characteristics.

Solutions to the wide-ranging water problems specific to each region of the world require a two-pronged approach: a long-term, comprehensive approach calling for global cooperation that brings together the wisdom of the world; and a local approach undertaken by multi-stakeholders sharing a common water history and culture. We pledge to join in the effort to promote this approach.

We should also recognize that humanity, throughout the long history of civilization, is responsible for the disruption, pollution, and disorderly consumption of the water provided by the natural water cycle, which is inherently continuous and enduring. We must always bear in mind that the water we are using today is borrowed from future generations, who will require it for their survival.

Therefore, we pledge to preserve the natural water cycle throughout every basin; develop social norms with a noble regard for the survival of humanity and all other organisms; and engage in a concerted effort with all multi-stakeholders involved in basin conservation to take action toward this end.

Throughout Kyoto's history — which extends back more than a millennium — our ancestors lived in villages and forests, developed the plains and nurtured a rich cultural heritage. At the same time, they fostered a spirit of genuine concern for water and adopted a prudent approach to water management, achievements of which we are very proud. It is our responsibility to preserve this spirit, nurtured in the beautiful natural environment of Kyoto, as well as a sound water cycle for future generations.

In this spirit, we walk hand-in-hand with the people of the world to whom we are linked through water.

March 20, 2003
Kyoto Executive Committee for the 3rd World Water Forum

UNESCO UNIVERSAL DECLARATION ON CULTURAL DIVERSITY

(signed in November 2001 in Paris)

The general conference,

Committed to the full implementation of the human rights and fundamental freedoms proclaimed in the Universal Declaration of Human Rights and other universally recognized legal instruments, such as the two International Covenants of 1966 relating respectively to civil and political rights and to economic, social and cultural rights,

Recalling that the Preamble to the Constitution of UNESCO affirms "that the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern",

Further recalling Article I of the Constitution, which assigns to UNESCO among other purposes that of recommending "such international agreements as may be necessary to promote the free flow of ideas by word and image",

Referring to the provisions relating to cultural diversity and the exercise of cultural rights in the international instruments enacted by UNESCO,[1]

Reaffirming that culture should be regarded as the set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs,[2]

Noting that culture is at the heart of contemporary debates about identity, social cohesion, and the development of a knowledge-based economy,

Affirming that respect for the diversity of cultures, tolerance, dialogue and cooperation, in a climate of mutual trust and understanding are among the best guarantees of international peace and security,

Aspiring to greater solidarity on the basis of recognition of cultural diversity, of awareness of the unity of humankind, and of the development of intercultural exchanges,

Considering that the process of globalization, facilitated by the rapid development of new information and communication technologies, though representing a challenge for cultural diversity, creates the conditions for renewed dialogue among cultures and civilizations,

Aware of the specific mandate which has been entrusted to UNESCO, within the United Nations system, to ensure the preservation and promotion of the fruitful diversity of cultures,

Proclaims the following principles and adopts the present Declaration:

IDENTITY, DIVERSITY AND PLURALISM

Article 1 - Cultural diversity: the common heritage of humanity

Culture takes diverse forms across time and space. This diversity is embodied in the uniqueness and plurality of the identities of the groups and societies making up humankind. As a source of exchange, innovation and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognized and affirmed for the benefit of present and future generations.

Article 2 - From cultural diversity to cultural pluralism

In our increasingly diverse societies, it is essential to ensure harmonious interaction among people and groups with plural, varied and dynamic cultural identities as well as their willingness to live together. Policies for the inclusion and participation of all citizens are guarantees of social cohesion, the vitality of civil society and peace. Thus defined, cultural pluralism gives policy expression to the reality of cultural diversity. Indissociable from a democratic framework, cultural pluralism is conducive to cultural exchange and to the flourishing of creative capacities that sustain public life.

Article 3 - Cultural diversity as a factor in development

Cultural diversity widens the range of options open to everyone; it is one of the roots of development, understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence.

CULTURAL DIVERSITY AND HUMAN RIGHTS

Article 4 - Human rights as guarantees of cultural diversity

The defence of cultural diversity is an ethical imperative, inseparable from respect for human dignity. It implies a commitment to human rights and fundamental freedoms, in particular the rights of persons belonging to minorities and those of indigenous peoples. No one may invoke cultural diversity to infringe upon human rights guaranteed by international law, nor to limit their scope.

Article 5 - Cultural rights as an enabling environment for cultural diversity

Cultural rights are an integral part of human rights, which are universal, indivisible and interdependent. The flourishing of creative diversity requires the full implementation of cultural rights as defined in Article 27 of the Universal Declaration of Human Rights and in Articles 13 and 15 of the International Covenant on Economic, Social and Cultural Rights. All persons have therefore the right to express themselves and to create and disseminate their work in the language of their choice, and particularly in their mother tongue; all persons are entitled to quality education and training that fully respect their cultural identity; and all persons have the right to participate in the cultural life of their choice and conduct their own cultural practices, subject to respect for human rights and fundamental freedoms.

Article 6 - Towards access for all to cultural diversity

While ensuring the free flow of ideas by word and image care should be exercised that all cultures can express themselves and make themselves known. Freedom of expression, media pluralism, multilingualism, equal access to art and to scientific and technological knowledge, including in digital form, and the possibility for all cultures to have access to the means of expression and dissemination are the guarantees of cultural diversity.

CULTURAL DIVERSITY AND CREATIVITY

Article 7 - Cultural heritage as the wellspring of creativity

Creation draws on the roots of cultural tradition, but flourishes in contact with other cultures. For this reason, heritage in all its forms must be preserved, enhanced and handed on to future generations as a record of human experience and aspirations, so as to foster creativity in all its diversity and to inspire genuine dialogue among cultures.

Article 8 - Cultural goods and services: commodities of a unique kind

In the face of present-day economic and technological change, opening up vast prospects for creation and innovation, particular attention must be paid to the diversity of the supply of creative work, to due recognition of the rights of authors and artists and to the specificity of cultural goods and services which, as vectors of identity, values and meaning, must not be treated as mere commodities or consumer goods.

Article 9 - Cultural policies as catalysts of creativity

While ensuring the free circulation of ideas and works, cultural policies must create conditions conducive to the production and dissemination of diversified cultural goods and services through cultural industries that have the means to assert themselves at the local and global level. It is for each State, with due regard to its international obligations, to define its cultural policy and to implement it through the means it considers fit, whether by operational support or appropriate regulations.

CULTURAL DIVERSITY AND INTERNATIONAL SOLIDARITY

Article 10 - Strengthening capacities for creation and dissemination worldwide

In the face of current imbalances in flows and exchanges of cultural goods and services at the global level, it is necessary to reinforce international cooperation and solidarity aimed at enabling all countries, especially developing countries and countries in transition, to establish cultural industries that are viable and competitive at national and international level.

Article 11 - Building partnerships between the public sector, the private sector and civil society

Market forces alone cannot guarantee the preservation and promotion of cultural diversity, which is the key to sustainable human development. From this perspective, the pre-eminence of public policy, in partnership with the private sector and civil society, must be reaffirmed.

Article 12 - The role of UNESCO

UNESCO, by virtue of its mandate and functions, has the responsibility to:
(a) Promote the incorporation of the principles set out in the present Declaration into the development strategies drawn up within the various intergovernmental bodies;
(b) Serve as a reference point and a forum where States, international governmental and non-governmental organizations, civil society and the private sector may join together in elaborating concepts, objectives and policies in favour of cultural diversity;
(c) Pursue its activities in standard-setting, awareness raising and capacity-building in the areas related to the present Declaration within its fields of competence;
(d) Facilitate the implementation of the Action Plan, the main lines of which are appended to the present Declaration.

MAIN LINES OF AN ACTION PLAN FOR THE IMPLEMENTATION OF THE UNESCO UNIVERSAL DECLARATION ON CULTURAL DIVERSITY

The Member States commit themselves to taking appropriate steps to disseminate widely the "UNESCO Universal Declaration on Cultural Diversity" and to encourage its effective application, in particular by cooperating with a view to achieving the following objectives:

1. Deepening the international debate on questions relating to cultural diversity, particularly in respect to its links with development and its impact on policy-making, at both national and international level; advancing consideration of the advisability of an international legal instrument on cultural diversity.

2. Advancing in the definition of principles, standards and practices, on both national and international levels, as well as of awareness-raising modalities and patterns of cooperation, that are most conducive to the safeguarding and promotion of cultural diversity.

3. Fostering the exchange of knowledge and best practices in regard to cultural pluralism with a view to facilitating, in diversified societies, the inclusion and participation of persons and groups from varied cultural backgrounds.

4. Making further headway in understanding and clarifying the content of cultural rights as an integral part of human rights.

5. Safeguarding the linguistic heritage of humanity and giving support to expression, creation and dissemination in the greatest possible number of languages.

6. Encouraging linguistic diversity – while respecting the mother tongue – at all levels of education, wherever possible, and fostering the learning of several languages from the earliest age.

7. Promoting through education an awareness of the positive value of cultural diversity and improving to this end both curriculum design and teacher education.

8. Incorporating, where appropriate, traditional pedagogies into the education process with a view to preserving and making full use of culturally appropriate methods of communication and transmission of knowledge.

9. Encouraging "digital literacy" and ensuring greater mastery of the new information and communication technologies, which should be seen both as educational disciplines and as pedagogical tools capable of enhancing the effectiveness of educational services.

10. Promoting linguistic diversity in cyberspace and encouraging universal access through the global network to all information in the public domain.

11. Countering the digital divide, in close cooperation with relevant United Nations system organizations, by fostering access by the developing countries to the new technologies, by helping them to master information technologies and by facilitating the digital dissemination of endogenous cultural products and access by those countries to the educational, cultural and scientific digital resources available worldwide.

12. Encouraging the production, safeguarding and dissemination of diversified contents in the media and global information networks and, to that end, promoting the role of public radio and television services in the development of audiovisual productions of good quality, in particular by fostering the establishment of cooperative mechanisms to facilitate their distribution.

13. Formulating policies and strategies for the preservation and enhancement of the cultural and natural heritage, notably the oral and intangible cultural heritage, and combating illicit traffic in cultural goods and services.

14. Respecting and protecting traditional knowledge, in particular that of indigenous peoples; recognizing the contribution of traditional knowledge, particularly with regard to environmental protection and the management of natural resources, and fostering synergies between modern science and local knowledge.

15. Fostering the mobility of creators, artists, researchers, scientists and intellectuals and the development of international research programmes and partnerships, while striving to preserve and enhance the creative capacity of developing countries and countries in transition.

16. Ensuring protection of copyright and related rights in the interest of the development of contemporary creativity and fair remuneration for creative work, while at the same time upholding a public right of access to culture, in accordance with Article 27 of the Universal Declaration of Human Rights.

17. Assisting in the emergence or consolidation of cultural industries in the developing countries and countries in transition and, to this end, cooperating in the development of the necessary infrastructures and skills, fostering the emergence of viable local markets, and facilitating access for the cultural products of those countries to the global market and international distribution networks.

18. Developing cultural policies, including operational support arrangements and/or appropriate regulatory frameworks, designed to promote the principles enshrined in this Declaration, in accordance with the international obligations incumbent upon each State.

19. Involving all sectors of civil society closely in framing of public policies aimed at safeguarding and promoting cultural diversity.

20. Recognizing and encouraging the contribution that the private sector can make to enhancing cultural diversity and facilitating, to that end, the establishment of forums for dialogue between the public sector and the private sector.

The Member States recommend that the Director-General take the objectives set forth in this Action Plan into account in the implementation of UNESCO's programmes and communicate it to institutions of the United Nations system and to other intergovernmental and non-governmental organizations concerned with a view to enhancing the synergy of actions in favour of cultural diversity.

1. Among which, in particular, the Florence Agreement of 1950 and its Nairobi Protocol of 1976, the Universal Copyright Convention of 1952, the Declaration of the Principles of International Cultural Cooperation of 1966, the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 1970, the Convention for the Protection of the World Cultural and Natural Heritage of 1972, the Declaration on Race and Racial Prejudice of 1978, the Recommendation concerning the Status of the Artist of 1980, and the Recommendation on Safeguarding Traditional Culture and Folklore of 1989.

2. This definition is in line with the conclusions of the World Conference on Cultural Policies (MONDIACULT, Mexico City, 1982), of the World Commission on Culture and Development (Our Creative Diversity, 1995), and of the Intergovernmental Conference on Cultural Policies for Development (Stockholm, 1998).

Updated 20/05/03

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