

3. Sector performance

This chapter provides information on planning and management in the water supply and sanitation sector, including targets for the sector, constraints to sector development, sector investment, costs and tariffs, and quality of service.

During the preparation phases of the Assessment 2000 report an effort was made to gather information on the performance and management of the water supply and sanitation sector in each country. This information included constraints to development, costs, tariffs, levels of investment and aspects of quality of service, such as continuity and water quality. Also included were approaches and institutional arrangements for managing the sector. The responses of individual countries will be presented in the JMP Databook 2000. This chapter provides an overview of the information collected.

3.1 Sector constraints

Of all the potential constraints to the development of the water supply and sanitation sector, four were ranked among the top 10 in every region of the world. One of these, logistics, is something of a catch-all category and has no simple solution. The other three principal constraints are unambiguous and interrelated. They are: funding limitations, inadequate cost-recovery, and inadequate operation and maintenance.

The constraints identified by the Assessment 2000 are similar to those identified by the Operation and Maintenance Working Group (11), which in varying degrees affect countries, districts, towns, villages and communities throughout the developing world. The identified constraints are:

- **Financial difficulties.**
- **Institutional problems.**
- **Inadequate human resources.**
- **Lack of sector coordination.**
- **Lack of political commitment.**
- **Insufficient community involvement.**
- **Inadequate operation and maintenance.**
- **Lack of hygiene education.**
- **Poor water quality.**
- **Insufficient information and communication.**

The importance of these constraints is borne out by other data presented in this report, such as the finding that, for many countries, water tariffs do not even meet the cost of water production, let alone the need of the sector to accumulate reserves for increasing capacity. Financial limitations are also a problem when the funds for investment are sufficient only to cover the recurrent costs of operation and maintenance. A frequent claim is that lack of involvement of communities in technology selection has been a major constraint. Various approaches and techniques have been developed to encourage local participation in identifying problems and ways to solve them.

These participatory approaches need to be applied more intensively to increase the effectiveness of implementing water supply and sanitation services (Box 3.1).

BOX 3.1 COMMUNITY PARTICIPATION IN PROBLEM-SOLVING: THE PARTICIPATORY HYGIENE AND SANITATION TRANSFORMATION (PHAST) APPROACH

The PHAST approach encourages local participation in defining problems and solutions related to water, sanitation and disease control. The community itself analyses its own beliefs and practices and then decides what needs to be changed. Outside experts, such as local health personnel, water and sanitation engineers and social scientists, also participate and share information with the community.

The PHAST approach was created because professionals realized that traditional health education techniques were not very effective in the water supply and sanitation sector. It is based on the following proven principles of adult learning and community development:

- Communities can and should determine their own priorities for disease prevention.
- Communities possess a huge store of health-related experience and knowledge, often including both traditional and modern wisdom.
- When people understand why improved sanitation is to their advantage, they will act.
- All people, regardless of their educational backgrounds, are capable of understanding that faeces carry disease and can be harmful, and can learn to trace and describe the faecal–oral route of disease transmission within their own environment.
- Communities can identify appropriate barriers to block disease transmission.

Source: (12)

3.2 Investment in Africa, Asia, and Latin America and the Caribbean

Figures 3.1–3.6 show the investments in water supply and sanitation for Africa, Asia, and Latin America and the Caribbean. Two sources of investment are shown: investment from government agencies (national) and investment from external support agencies. Investments were averaged over the years 1990–2000 for each country that provided information. A total investment was then determined for all the countries that provided data and extrapolated for the whole region. Data were not available for Europe, and there were only five returns from Oceania, all from small islands, which cannot be considered sufficiently representative of the region. The data received from Northern American countries are not sufficient to determine regional statistics. This section, therefore, deals only with Africa, Asia, and Latin America and the Caribbean, for which the information available appears to be representative. Investments made directly by householders that were independent of government aid (for example, for the construction of a private latrine), are unlikely to have been included in the country figures reported. It is also possible that the national investment figures provided by some of the countries might have included loans from international development banks.

Figure 3.1 deals with investment in urban water supply. The

corresponding investment in rural water supply is shown in Figure 3.2. It is clear that the level of investment in rural water supply in Latin America and the Caribbean is far lower than the corresponding investments in Asia and Africa. This can be explained by the fact that the rural population of Latin America and the Caribbean is much smaller than the rural populations of Africa and Asia. Furthermore, the investment in rural water supply is less than that in urban water supply for every region, despite the huge gaps in rural coverage; and the total investment in rural water supply is roughly half that in urban water supply, whether from local or external sources (cf. Figures 3.1 and 3.2).

Investment in urban sanitation is shown in Figure 3.3. In all of the regions shown, the figures indicate a much lower level of investment in sanitation than in urban or rural water supply. Africa's dependence on external sources of investment is clearly illustrated, as is the substantially higher local investment level in Latin America and the Caribbean. Latin America and the Caribbean also successfully attracted more external contributions than other regions.

With regard to rural sanitation, Figure 3.4 shows that investment is very small when compared with levels of investment in rural water supply or urban sanitation (cf. Figures 3.2 and 3.3). Again, the level of investment in Latin America and the Caribbean compares favourably with practically all other regions, bearing in mind the small rural population.

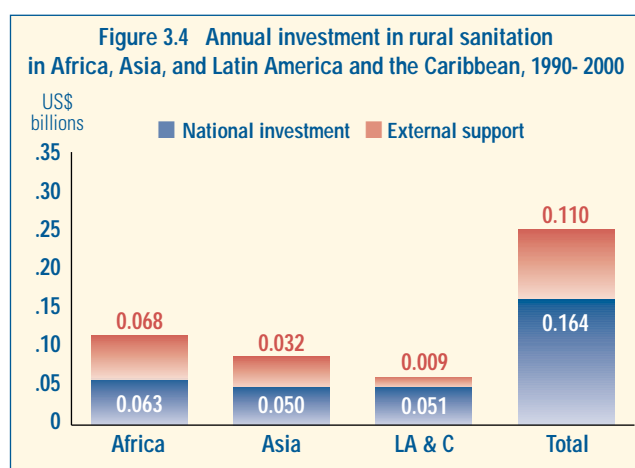
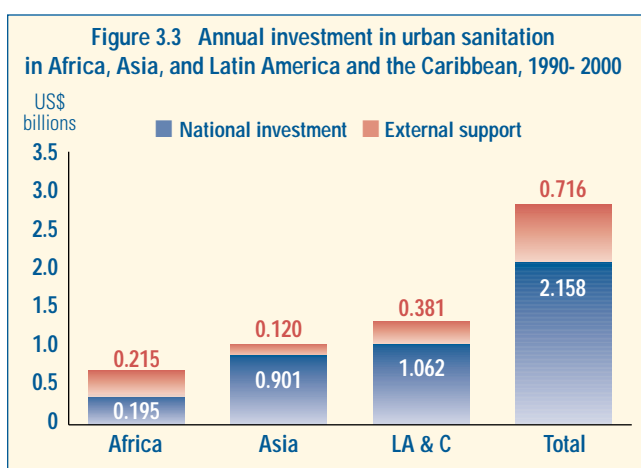
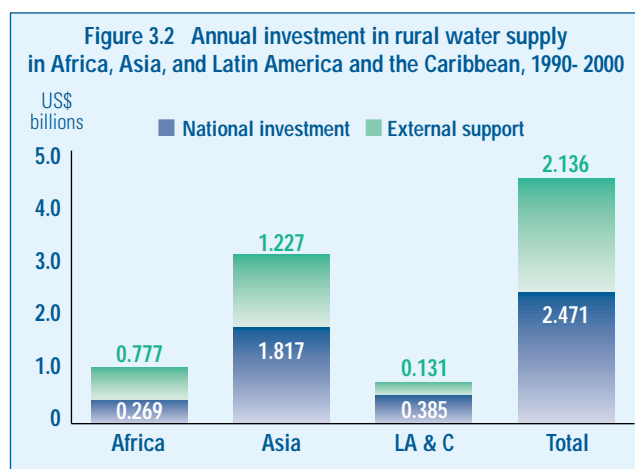
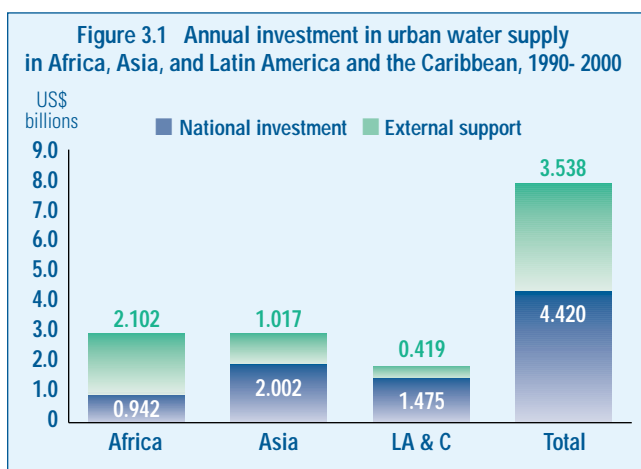
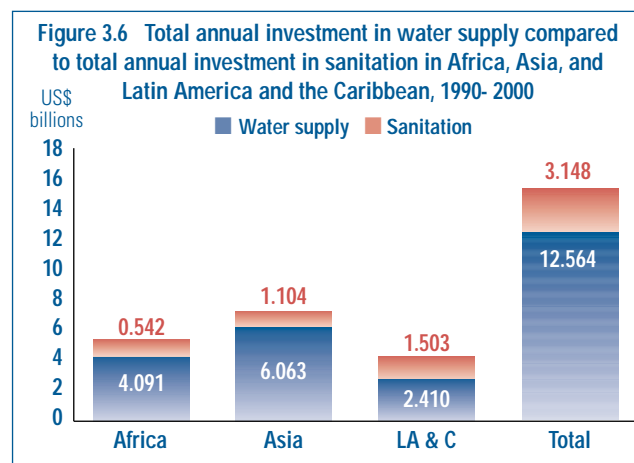
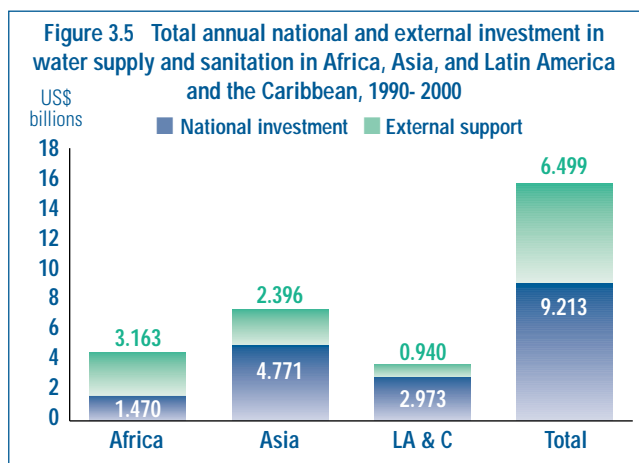


Figure 3.5 shows the total annual local and external investment in water supply and sanitation. In terms of total investment, Africa received the most external investment for the water supply and sanitation sector, but also invested fewer local resources than any other region. The importance of external support is evident (Box 3.2).

Sanitation is not normally considered a priority in development projects and a comparison of the total investment in water supply with the total investment in sanitation makes the relative neglect of sanitation abundantly clear (Figure 3.6).

The current low level of sanitation coverage (only 60% of the global population has access to any sort of improved sanitation) appears to be

explained in part by the low level of investment in sanitation when compared with the investment in water supply. Of the total annual investment in the sector, approximately US\$ 16 billion, only one-fifth seems to be directed to sanitation. Despite that relatively low level of investment the progress over the decade, measured in terms of additional people served with sanitation facilities, has been huge. The reason for this progress might be that investment has been made not only by governments and external support agencies, but also directly by householders through low-cost technologies. Such investment, however, is not likely to appear in the statistics.



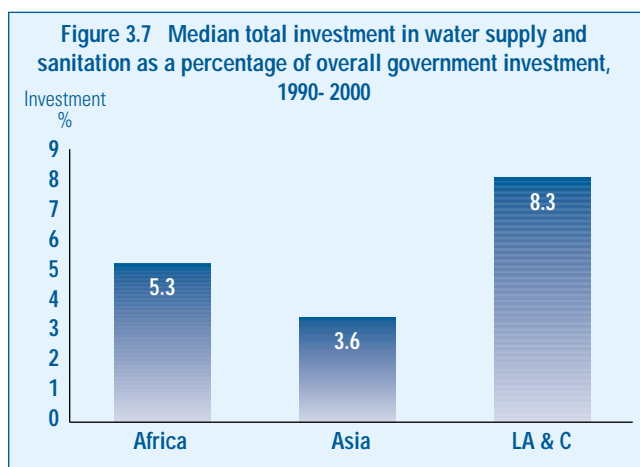
BOX 3.2 SUPPORT PROVIDED FOR THE WATER SUPPLY AND SANITATION SECTOR IN DEVELOPING COUNTRIES

Most member states in the Organisation for Economic Co-operation and Development (OECD) have provided strong support for developing countries in efforts to improve the water supply and sanitation sector. For OECD countries as a whole, the proportion of development assistance devoted to water supply and sanitation increased steadily from 1986–1996, rising from 3.4% (France and New Zealand data missing) to 6.6% of total assistance. In terms of cash, bilateral commitments from OECD countries for assistance to developing countries rose from US\$ 1.034 billion (France and New Zealand missing) in 1986 to US\$ 2.907 billion in 1996. In absolute terms, Germany and Japan were particularly big contributors to the sector over the period 1986–1996: Germany spent nearly US\$ 3.4 billion on developing water supply and sanitation systems, while Japan invested over US\$ 9.5 billion.

Year	Water supply and sanitation as a percentage of total cooperation 1986- 96	Cooperation to water supply and sanitation 1986- 96 (US\$ billions)
1986	3.4	1034
1987	3.7	1323
1988	4.2	1866
1989	3.8	1508
1990	3.2	1844
1991	3.2	1835
1992	4.2	2124
1993	5.5	2727
1994	5.1	2552
1995	5.6	3034
1996	6.6	2907

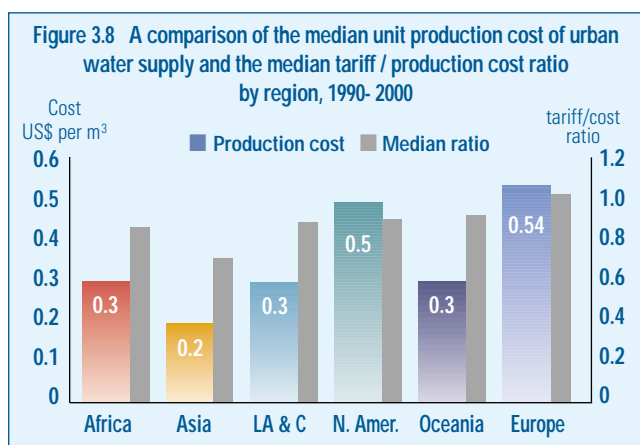
Source: (13)

Figure 3.7 shows governmental investment in water supply and sanitation as a proportion of overall governmental investment. Among the three regions, the proportion invested in water supply and sanitation is highest in Latin America and the Caribbean, and is more than double that invested in Asia. The difference in the levels of investment shows what is feasible when there is the will to resolve the sector's shortcomings.



3.3 Costs and tariffs of urban services

Overall, there was remarkably little variation in the median unit production cost of water between developing regions of the world, although the variation was greater between subregions and between countries. Figure 3.8 shows that more than half the countries of each region (except for Europe and Northern America) charge an urban water tariff that is less than the unit cost of production of the water.



Regional median tariffs per cubic metre for water and sewerage services are shown in Figure 3.9. The highest median tariff for water is found in Europe and the lowest in Asia. Between these two extremes the other regions show remarkably little variation compared with the variation between individual countries within each region. Sewerage tariffs are also shown and they are lower than the water tariffs. The sewerage tariffs for Oceania are not shown, as only a few countries provided reliable relevant information.

Analysis of available information leads to the conclusion that water tariffs do not cover the full cost of the services provided. Although there is insufficient information to allow for graphical presentation, it appears

that standpipe charges are considerably lower than charges for house connections. In urban areas standpipes may be seen as the minimum acceptable social provision for overall protection of human health; maintaining at least this level is therefore a priority. In Latin America and the Caribbean, the median standpipe charge is nil, as is the case for a number of individual countries in the other regions. A possible reason why water collected from standpipes is not paid for is that standpipe charges are difficult to collect. However, the fact that charges are not applied frequently causes these services to be unsustainable. Experience suggests that a possible way of overcoming this difficulty is for communities to manage their water points. Such management includes charging for the water delivered, according to an agreement with the water agency. The small revenue from these charges ensures the operation and maintenance of the standpipe facilities. When the users of standpipes cannot afford the costs implied in operating and maintaining the system, cross-subsidization by a relatively small surcharge on house connections is a possible solution.

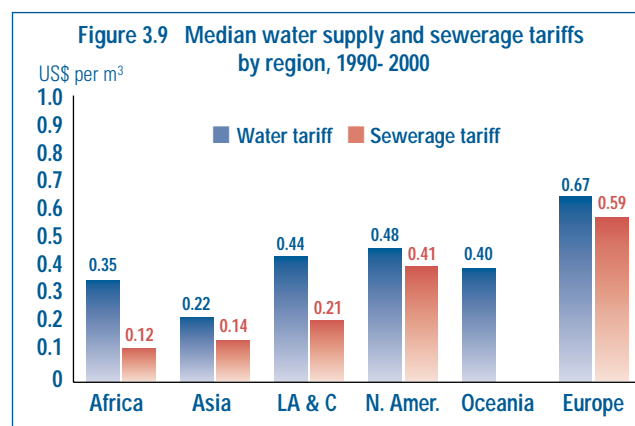
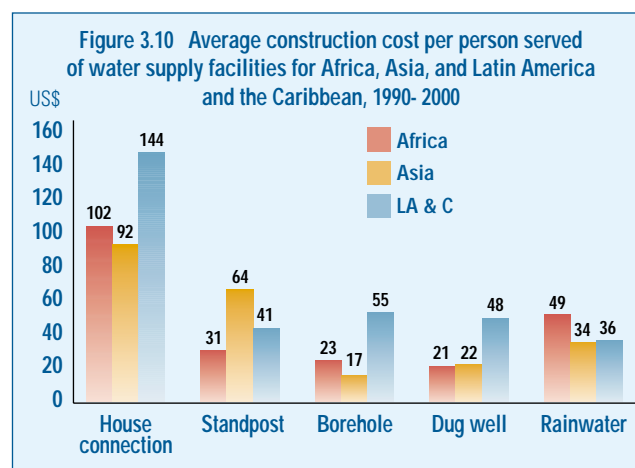
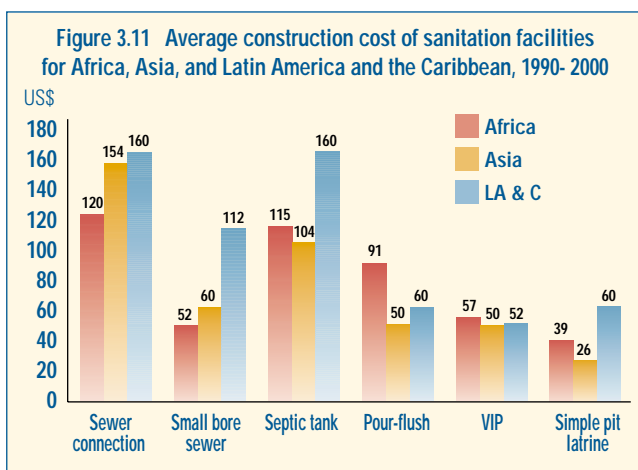


Figure 3.10 shows the average reported construction costs of different types of water supply facilities. The variations between regions are to some extent the result of differing water resource endowment, differing unit costs for construction in general, and differing levels of service offered. The figures should be considered rough estimates. They may vary widely because costs will be significantly affected by factors such as population density and ease of access of water sources.



The average construction costs for a range of sanitation facilities are shown in Figure 3.11. While simple on-site systems tend to be cheaper than systems such as sewerage and septic tanks, the difference is sometimes less than might be expected. There is still a need for less costly sanitation facilities that meet the needs of the poor. The provision of such facilities is also important in protecting public health. Because the level of facilities associated with the indicated costs are not clear, the average costs presented in Figure 3.11 should be used with caution.



3.4 Quality of service

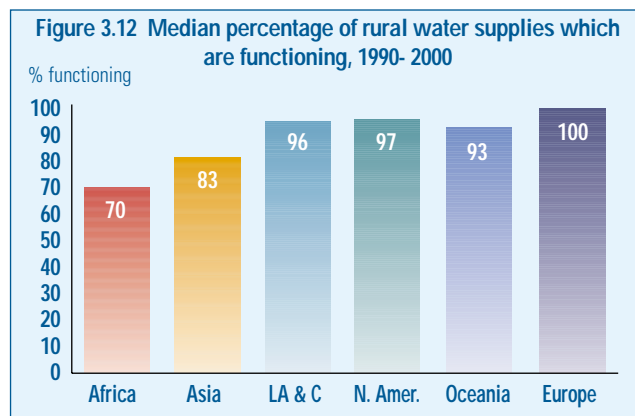
It is estimated that over one-third of the urban water supplies in Africa, and in Latin America and the Caribbean, and more than half those in Asia, operate intermittently. Intermittent water supply is a significant constraint on the availability of water for hygiene and encourages the low-income urban population to turn to alternatives such as water vendors. These vendors often charge many times more than the formal water tariff for water that is often of doubtful quality and not available in adequate quantities.

While the average intermittent system is reported to operate for more than half the time, this disguises large local variations between systems and within each distribution network. When there is frequent intermittence in the water distribution system, the consumers are commonly equipped with domestic storage tanks. Although these devices help to reduce hourly peaks in demand and mask short-term interruptions for users, they are often neither properly protected nor regularly cleaned and disinfected, which creates considerable risks of contamination. When the systems function intermittently, contamination may also occur by intrusion of contaminated water into the pipelines through faulty joints, cracks, etc. In addition, the pipelines are subject to additional stress caused by transient flows, affecting the durability of the system and weakening pipes and joints.

Many urban drinking-water systems do not disinfect the water. The information provided by countries indicates that roughly one in five systems in Africa, Asia, and Latin America and the Caribbean, and two in five systems in the small islands of Oceania, are not disinfected. The low prevalence of disinfection in some developing countries suggests that factors such as cost, maintenance of equipment and concern about chlorination by-products may be involved. This gives cause for concern,

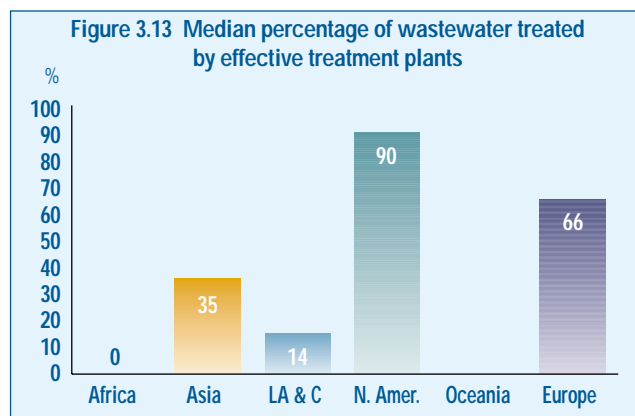
as failure to disinfect drinking-water can put public health at far greater risk than the by-products of chlorination (14).

No one familiar with the rural water supply sector will be surprised at the finding that a substantial proportion of rural systems fail to function at any given time (Figure 3.12). Piped systems were considered to be “functioning” if they were operating above 50% of their design capacity on a daily basis. For handpumps, “functioning” was taken to mean that they operated for more than 70% of the time, with a time lag between breakdown and repair not greater than two weeks.



The true figures may well be worse than those shown, as few countries keep systematic records of breakdown rates in rural areas at central level. In addition, many rural supplies, while meeting the definition of “functioning”, do not in fact provide a satisfactory service, because of deficiencies in water quality, unsuitable location or restrictions on their use. The relatively low proportion of rural systems functioning in Africa is understandable in light of the limited resources available and the large distances between water supplies, which are related to low population density in much of the continent.

The lack of treatment of wastewater is another health hazard. Figure 3.13 shows the median percentage of urban wastewater collected through sewerage systems that is reported to be treated in sewage treatment plants. In the developing regions of the world, treatment is applied in only a minority of systems. Even in the industrialized countries, for example in Northern America, sewage is not universally treated. The available information on Oceania is insufficient to provide statistics for the region.



The discharge of untreated sewage is especially hazardous to health where the receiving water bodies are rivers or lakes and where, as in some developing countries, these may be used untreated as sources of drinking water. In such cases, conventional treatment methods do not necessarily provide the requisite degree of pathogen removal for health protection. In practice, inappropriate technologies are often used. Raw sewage discharge can also harm the environment, though this impact may be minor if there is sufficient dilution.

3.5 General planning and management

Figure 3.14 shows the proportion of countries, among those that responded, which have prepared or are currently preparing water supply and sanitation plans. There was no significant difference between the regions and more than half the countries had already prepared plans. Altogether more than four out of five had either prepared a plan or were doing so.

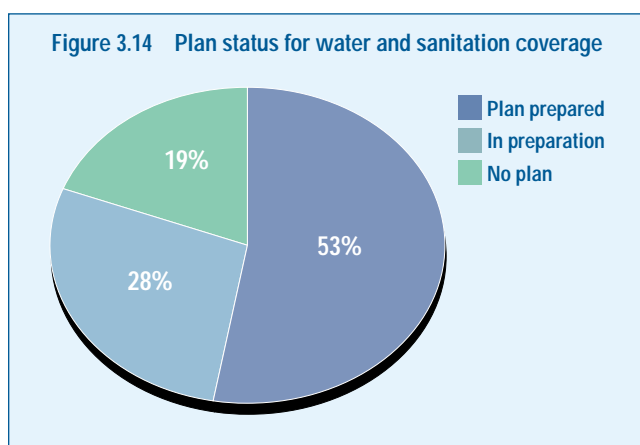


Figure 3.15 shows the proportion of responding countries that have established, or have partially established, a set of targets for coverage with water supply and sanitation in urban and rural areas. The proportions are broadly similar because targets tend to be established as part of the plan preparation procedure. Between regions, too, only small variations were seen. A somewhat smaller proportion of countries in Oceania have established targets, and this may reflect the limited planning capacity of the small island states.

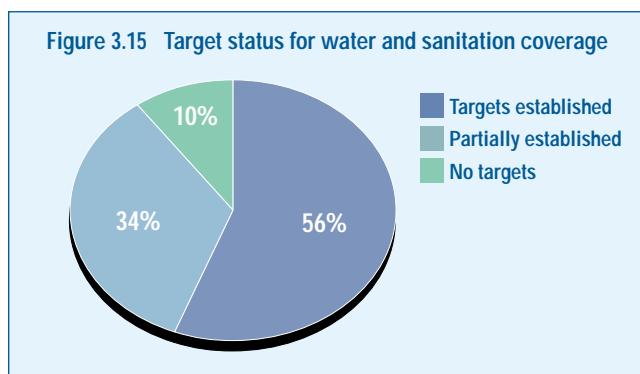
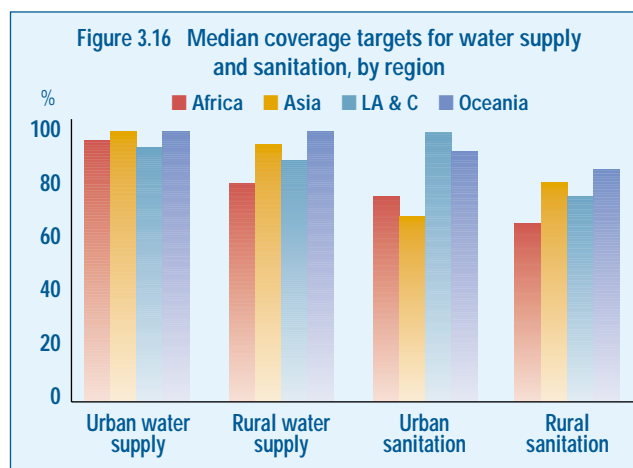


Figure 3.16 shows the median coverage targets established in each region. The targets for sanitation are generally lower than the corresponding targets for water supply, and those for rural areas are mostly lower than those for urban coverage. The available information suggests that the current bias in resource allocation towards urban areas and away from the rural population, and also towards water supply and away from sanitation, is set to continue unless specific efforts are made to change policy.



There are differences in the targets between regions, particularly regarding rural coverage. The relatively modest targets of Africa for sanitation, and of Latin America and the Caribbean for rural water supply and sanitation, are especially noteworthy.

It is hoped that the new survey-based coverage figures presented in this report will spur a revision of plans and policies. Many of the current targets are based on providers' estimates of coverage and are lower than current estimates of coverage ascertained by household surveys. These targets are therefore in urgent need of revision.

Figure 3.17 shows the results of an enquiry regarding the management of rural water supply facilities. More than half the countries in each region, with two exceptions, reported that they have a national policy for the community management of rural water supply and sanitation facilities. The two exceptions were Northern America, for which only two country returns were received, and Oceania where the returns were predominantly from small island states, which in many cases do not have a distinct rural sector.

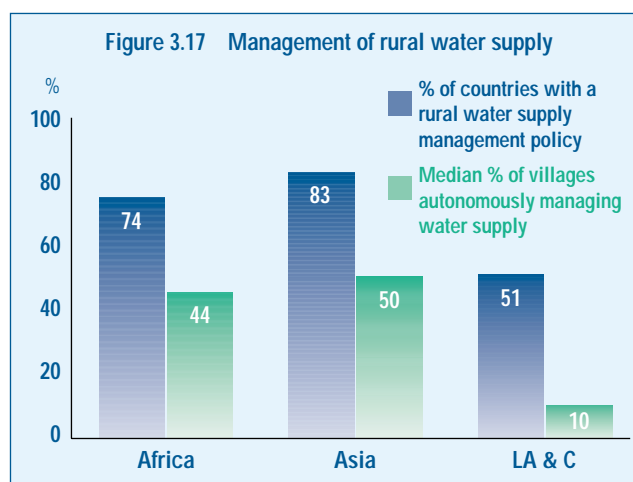


Figure 3.17 also shows the median proportion of rural communities reported to manage their own water supply systems. Bearing in mind the difficulties encountered by village institutions in managing infrastructure, these proportions are remarkably high. The low figure for Latin American and the Caribbean region also seems to be due to the presence of many Caribbean island states, where maintenance is the responsibility of the urban water supply agency.

In all regions of the world, the majority of urban water supply utilities are still publicly operated (Table 3.1). Nevertheless, many countries reported a degree of private sector participation in delivering urban water supply services. This participation involves not only large private utility companies, but also organizations such as nongovernmental organizations, community-based organizations and religious groups. When the contractual arrangements were specifically mentioned, the options most commonly cited by developing countries were concessions and management contracts. A number of reports, particularly from African countries, mentioned that the countries were moving towards greater private sector management of water supply.

TABLE 3.1 PUBLIC PROVISION OF URBAN WATER SUPPLY

Region	Median %
Africa	100
Asia	93
Latin America and the Caribbean	92
Northern America	55
Oceania	90
Europe	90

In many countries, the institutions that manage the water supply and sanitation sector, and particularly the sanitation subsector, are fragmented. In half the countries reporting, rural water supply is the responsibility of a ministry that is principally or largely concerned with water. In one in 10 of the countries of Asia, Africa and the Americas which reported, no national body is identifiably responsible for either urban or rural sanitation.

This Assessment 2000 covered a substantial number of industrialized countries, and their reports on management of rural and urban water supply and sanitation are in contrast to those from the developing world. In the richer countries, the operational functions of the central government agencies are practically non-existent and these agencies play an essentially regulatory role. Operational issues are devolved to local governments and other bodies at state, provincial or municipal levels. The relative concentration of operational functions at national level in the developing countries may, to some extent, be due to weak local government, but is also favoured by the need of external support agencies, and the governments they support, for a central point of contact.

