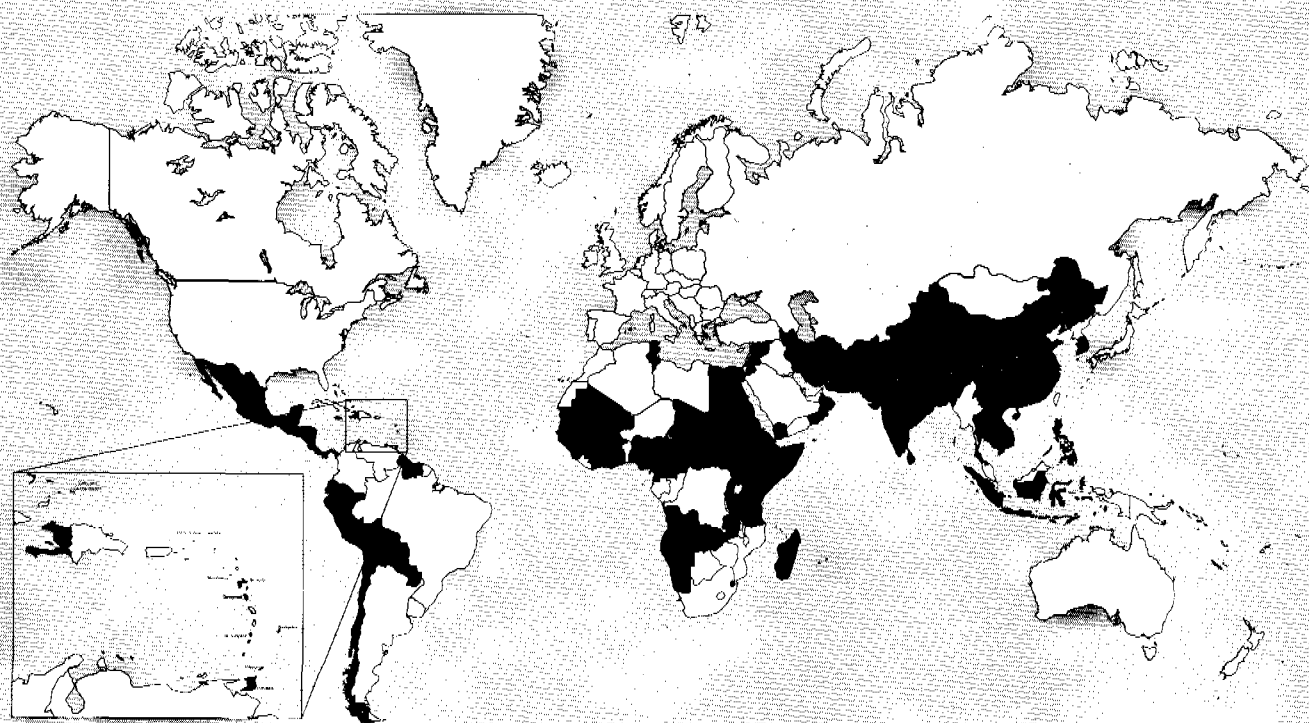


Water Supply and Sanitation Sector Monitoring Report 1993

Sector Status as of 31 December 1991



World Health Organization (WHO)



Water Supply and Sanitation Collaborative Council



United Nations Children's Fund (UNICEF)

Water Supply and Sanitation Sector Monitoring Report 1993

(Sector Status as of
31 December 1991)

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This publication contains maps, charts and tables developed from 1991 data on sector coverage, management and funding, which were kindly provided by those countries listed in Table 2 on page 15. This information can be compared to the data provided in the first WHO/UNICEF Joint Water Supply and Sanitation Monitoring Programme report "Water Supply and Sanitation Sector Monitoring Report 1990 (Baseline Year). Such comparison should facilitate the identification of consistencies and inconsistencies in reporting as well as developments during the first year of the decade of the 1990s.

The format used by governments to assess the status of the sector was basically the same as that in 1990 to facilitate such comparisons, although modifications were introduced to render the data more responsive to national planning and management needs.

WHO and UNICEF hope that both data quality, accuracy and reporting will continue to improve over time as a result of capacity building efforts within countries, and that progressively the number of countries providing information will increase.

The boundaries and colour maps used in this publication do not imply any judgment on the legal or other status of any territory, endorsement or acceptance of any boundary, or guarantee of the accuracy on the part of WHO and UNICEF.

Published August 1993

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Foreword

Since writing the foreword to the first annual report of the WHO/UNICEF Joint Water Supply and Sanitation Monitoring Programme in 1992, I have followed the programme's development with great interest. The status of water supply and sanitation services in the world's developing countries continues to be a major cause for concern affecting the health of millions of people, and this situation will clearly continue. There are still approximately 1000 million people without access to an adequate and safe water supply, and 1700 million without means of excreta disposal.

Through supporting countries in upgrading their ability to monitor water supply and sanitation development, a capability will be developed with potential for improving planning and management and hence accelerating progress. It will also enable the limited funds allocated to the sector to be better targeted towards those in greatest need and hence maximize the health and socio-economic benefits. Where ill-health associated with inadequate water supply and sanitation is concerned those most at risk and worst affected are the poorest members of society, and in particular the children in urban marginal settlements, slums and rural disadvantaged areas.

Through its Working Group on Information Management, the Collaborative Council for Water Supply and Sanitation has reviewed the methodologies contained in the Joint Monitoring Programme and has endorsed it as an initiative which could benefit from the broader partnership of its members, particularly in support of country level activities.

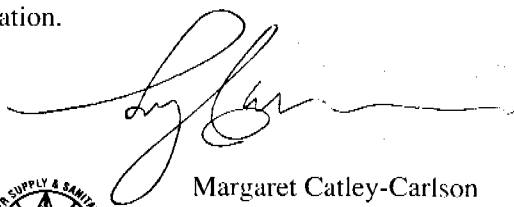
The Joint Monitoring Programme is closely responding to country-level demand as witnessed by the number of countries actively taking steps to improve or develop their national monitoring systems through adaptation of the approach proposed by the Joint Monitoring Programme (JMP). In fact, 1992

marked a watershed in the development of the programme with the thrust moving from the development of methodologies and approaches to implementation of these by countries to strengthen their capacity to plan and manage water supply and sanitation services.

Capacity development for monitoring water supply and sanitation at country level will support the efforts to monitor progress towards the attainment of the Goals for Children and Development in the 1990s. The experience gained in monitoring the sector could be used in monitoring of other goals, for example, education and nutrition.

As Chairperson of the Collaborative Council it is heartening to see two of its founder members, WHO and UNICEF, putting good intentions into concrete action and collaborating in this joint programme, the main objective of which is to support capacity-building at country level in the spirit of UNCED's Agenda 21. I would like to recommend and encourage an expansion of the WHO and UNICEF collaboration in this venture with the active support of additional multi-lateral as well as bi-lateral agencies.

As with the first JMP Report, the Collaborative Council is very pleased to distribute this report to all its members. We hope it will achieve the objective of contributing to maintaining a focus on the needs of the water supply and sanitation sector and the challenges facing most developing countries. It has the potential to be a strong sector advocacy tool at national and international levels, and to promote strengthened external support coordination.



Margaret Catley-Carlson
Chairperson
Water Supply and Sanitation
Collaborative Council

The status of water supply and sanitation services in the world's developing countries continues to be a major cause for concern affecting the health of millions of people, and this situation will clearly continue.

There are still approximately 1000 million people without access to an adequate and safe water supply, and 1700 million without means of excreta disposal.

Executive Summary

The Water Supply and Sanitation Sector Monitoring Report 1993 differs from that of 1992 in that it attempts to highlight progress made with the enhancement of sector monitoring at country level over the past year.

The 1993 Report also presents more comprehensive global and regional data given that both percentage and absolute service coverage are provided. This report is intended to provide information on progress in implementing the WHO/UNICEF Joint Water Supply and Sanitation Monitoring System. It is not presented as an assessment of the status of global water supply and sanitation. However, annexes have been incorporated with detailed information which will hopefully facilitate further analysis by readers interested in pursuing this issue.

Data from 82 countries have been incorporated into the preparation of the report. It comprises a programme overview, consideration of mechanisms to enhance sector monitoring at country level, an analysis of the data received for the end of 1991, examples of country level applications from six countries: two from Latin America and four from Africa, and ends up with a review of the experience gained to date from country level application of the monitoring programme and conclusions.

The Programme Overview traces progress made with the implementation of the JMP to date with emphasis on national initiatives, including reference to national and sub-national workshops convened in Bolivia, Nigeria, Papua New Guinea, the Philippines and Burundi, and the planning for such events in other countries including Egypt and Brazil. In several countries (Brazil, Bolivia, Guyana, Jamaica and Ecuador) reference is also made to initiatives to enhance monitoring capability.

The main progress reported has been in countries of the regions which benefitted from regional and/or sub-regional workshops in 1991/1992; Africa and Latin America and the Caribbean.

Promotion of country level water supply and sanitation monitoring has been pursued through a variety of mechanisms including advocacy initiated with other members of the external support community and close collabora-

tion with the Information Management Working Group of the Collaborative Council for Water Supply and Sanitation. It also includes the provision of catalytic funding from the global and regional levels by UNICEF and WHO to support country activities, and updating of software and approaches to respond to country specific needs including translations into Arabic and Portuguese. These efforts are continuing.

In addition, 15 countries have provided for sector monitoring to be included in the five-year Government/UNICEF Country Programme Proposals going to the UNICEF Executive Board in 1994.

Since the main thrust of the JMP is support to country initiatives, this report includes a review of mechanisms to enhance monitoring at the country level with potential approaches being outlined.

The analysis of the results contained in the report is provided to highlight (in general terms) the current situation, indicate the type of analysis such data can provide, and enable a comparison to be made with reports for 1990. It is sufficient to say that at the end of 1991 indications are that while approximately 1700 million people in developing countries are served with water through a pipe supply, there still remain 1000 million people unserved. There are also estimated to be around 1700 million people still without access to appropriate means of excreta disposal.

Information available also continues to indicate a high level of government subsidies to Operations and Maintenance (O&M) particularly in the high-income urban areas, and that funding of water supply predominates over sanitation.

The examples of country application of the JMP approaches presented in this report come from Benin, Bolivia, Brazil, Cape Verde, Egypt and Togo. These examples highlight the different approaches taken and the need for flexibility in developing and strengthening monitoring capability in countries. For example:

- Benin has initiated activities by monitoring coverage of water supply and sanitation service in its six Provinces/Departments

Since the main thrust of the JMP is support to country initiatives, this report includes a review of mechanisms to enhance monitoring at the country level with potential approaches being outlined.

Responding to the ever growing demands by countries for cooperation in developing water supply and sanitation monitoring networks will necessitate supplementation of the limited resources of both UNICEF and WHO by other external support agencies.

without disaggregating the data by technology or population group.

- Bolivia has focused its attention on water supply and sanitation coverage in its departmental capitals, again without disaggregation of data.
- Brazil has initiated a pilot application in one State, Pernambuco, and through a national workshop it is intended that this should lead to national application.
- Cape Verde has developed a national monitoring network based on the basic national subdivisions: the islands. For the two largest islands data are collected and analysed by 'concelho', the second administrative sub-division down from central government.
- In Egypt a pilot approach is also being implemented with the focus on the four governorates of the Upper Nile.
- Togo is following a similar approach to Benin. However, it has been able to include from the outset funding and management into its data collection.

The lessons learned by the Joint Monitoring Program (JMP) to date include:

- Further clarification is required of the difference between the monitoring of "strategic parameters" as addressed by the JMP and the monitoring of "operational parameters" such as water losses, tariffs, project implementation, etc.

- The flexibility of the WASAMS computer software through its "open-ended" capability is essential for country level application.
- Several issues have to be addressed in initiating a national monitoring network, these include: standardization of data formats, improvement of data on funding, and increased capacity to disaggregate data.
- There is an increased awareness by governments and external support agencies of the value of monitoring for planning and management.
- Monitoring has been recognized as a strong coordination tool among national agencies responsible for water supply and sanitation.
- Responding to the ever growing demands by countries for cooperation in developing water supply and sanitation monitoring networks will necessitate supplementation of the limited resources of both UNICEF and WHO by other external support agencies. This should include monitoring as a component of their capacity building programme and expanding of partnerships to more effectively respond to country level needs. 🌐

I. Programme Overview

Approximately two years remain before all United Nations member states will have to report progress on the water supply and sanitation sector to the United Nations' General Assembly at its 50th session in 1995. At that time, it will be possible to more effectively judge whether the sector is moving away from its "business as usual" approach which, if pursued, will not significantly change the current gap between the served and the unserved. Likewise, it will help gauge the efforts being undertaken by many countries to get a better grasp on the facts and figures of their water and sanitation sectors. This will provide a means to improve planning, better target ever scarcer resources, and enhance overall management of the sector to yield the expected results.

Some recent developments on monitoring definitely show that the sector is in a process of becoming more effective. Indications are that it is thus gearing itself to more realistically face the enormous challenge of facilitating the provision of water and sanitation services to all.

During 1993 the Joint Monitoring Programme (JMP) had planned to pursue Regional Workshops in Asia on water supply and sanitation monitoring similar to those already undertaken in Latin America, the Caribbean and Africa during 1991 and 1992. Although there has been some delay in this process, it is expected that one sub-regional workshop will be held in South Asia during November 1993. Several countries including Bolivia, Nigeria, Papua New Guinea, Philippines and Burundi have already held national or sub-national workshops to pursue the enhancement of sector monitoring. Other countries such as Egypt and Brazil have plans to hold meetings in the very near future.

Progress has been achieved in several countries of Latin America and the Caribbean. The Pan American Health Organization (PAHO) reports that active sector monitoring enhancement initiatives are ongoing in Brazil, Bolivia, Guyana, Jamaica and Ecuador, to mention a few countries in the Region. Some of these initiatives have taken place spontaneously as a follow-up from sub-regional workshops, while others have emerged from active

country level WHO/AMRO/PAHO and/or UNICEF support.

Since publishing "Water Supply and Sanitation Sector Monitoring Report 1990 (Baseline Year)" at the end of 1992, the JMP has continued its thrust of supporting the enhancement of country level sector monitoring through a variety of mechanisms including:

- Advocacy initiatives amongst other multi-lateral and bi-lateral agencies in both North America and Europe to enlarge the JMP partnership in support of country level sector capacity building initiatives.
- Close liaison with the Collaborative Council for Water Supply and Sanitation (CC-WS&S) working group on "information management" to complement and integrate initiatives.
- Discussions with several bi-lateral agencies by both WHO and UNICEF management on providing specific financial support for the enhancement of this initiative.
- Direct support by UNICEF and WHO to several countries to bolster local sector monitoring enhancement initiatives with global and regional funding.
- Inclusion of specific "capacity building in sector monitoring and advocacy" projects in some 15 five-year Government/UNICEF Country Programme Proposals going to the UNICEF Executive Board in 1994.
- Production and distribution to all participants of 1991 and 1992 JMP workshops of version 2.0 of the WASAMS computer programme containing an "open-ended feature", a capability which enables users to produce their tailor-made monitoring modules, indicators and parameters.
- Translation, and distribution, of version 2.0 of WASAMS into French (WHO-Geneva) and Spanish (AMRO/PAHO-Washington).
- Translation of WASAMS into Arabic (ongoing) by the WHO Centre for Environmental Health Activities (CEHA) in Amman, Jordan, and into Portuguese (WHO-Geneva).

The JMP has continued its thrust of supporting the enhancement of country level sector monitoring through a variety of mechanisms.

Even more encouraging have been the actions undertaken at country level towards implementing the concept of enhanced sector monitoring.

Even more encouraging (other than the workshops held to discuss enhancement of sector monitoring or the complementary actions undertaken by the multi-lateral partners to this effort) have been the *actions undertaken at country level* towards implementing the concept of enhanced sector monitoring. UNICEF is currently in the process of providing catalytic financial support for monitoring to Egypt, Brazil, China, Ethiopia, Eritrea, Laos, Sri Lanka, Viet Nam and the Central Asian Republics. WHO/AFRO (Africa Regional Office) is proceeding with a similar approach in Benin, Burundi, Nigeria, Mozambique and Tanzania.

Countries as diverse as Benin, Bolivia, Brazil, Cape Verde, Egypt and Togo, (to mention a few examples) have prepared country level examples of monitoring for this report (see Section IV). These countries have taken assertive steps to introduce enhanced and systematic monitoring. In doing so, they have allowed greater attention to be focussed on the urgent need to optimize sector investments to redress current imbalances between the served and the under- or un-served.

The JMP efforts are also being linked to other initiatives supported by the water supply and sanitation sector, such as the use of geographic information systems (GIS) to facilitate the eradication of dracunculiasis. The GIS is basically computer data bases with the addition of special coordinates from which maps can be drawn by computer. These are used to show the distribution of guinea worm cases in relation to the location of water supplies, health centres, schools and other features; they are a potentially very powerful aid to programming. This linkage will particularly benefit Nigeria, Benin, Uganda and Burkina Faso in guinea worm eradication in the near future.

Evaluation of Country Level Application

As a first attempt to monitor progress in implementing the JMP approach at country level, six questions were addressed:

- Is systematic monitoring of water supply and sanitation services undertaken?
- Has a sector monitoring meeting been arranged among national agencies responsible for the sector?
- Has a National Monitoring Unit been established?
- Has the WASAMS format been adopted or adapted and used on a pilot scale?
- Has the WASAMS format been adopted or adapted and used on a national scale?
- Is annual sector reporting undertaken?

These questions follow the steps outlined in the generic guidelines for developing enhanced sector monitoring at country level. These guidelines emerged from recommendations by the participants of the regional workshops held in Jamaica, Swaziland and Benin in 1992 and are contained in Annex V of the 1990 JMP report.

The above questions were asked for both 1991 and 1992 to enable progress to be identified. Information was obtained for 41 countries, and the responses are contained in Table 1.

Judging from the sample of countries available, the increase in 22 per cent of the number of countries reporting monitoring reviews clearly indicates an expanding interest in monitoring. The larger increase in the number of countries reporting having convened a meeting of the national agencies responsible for water and sanitation indicates that greater efforts

TABLE 1

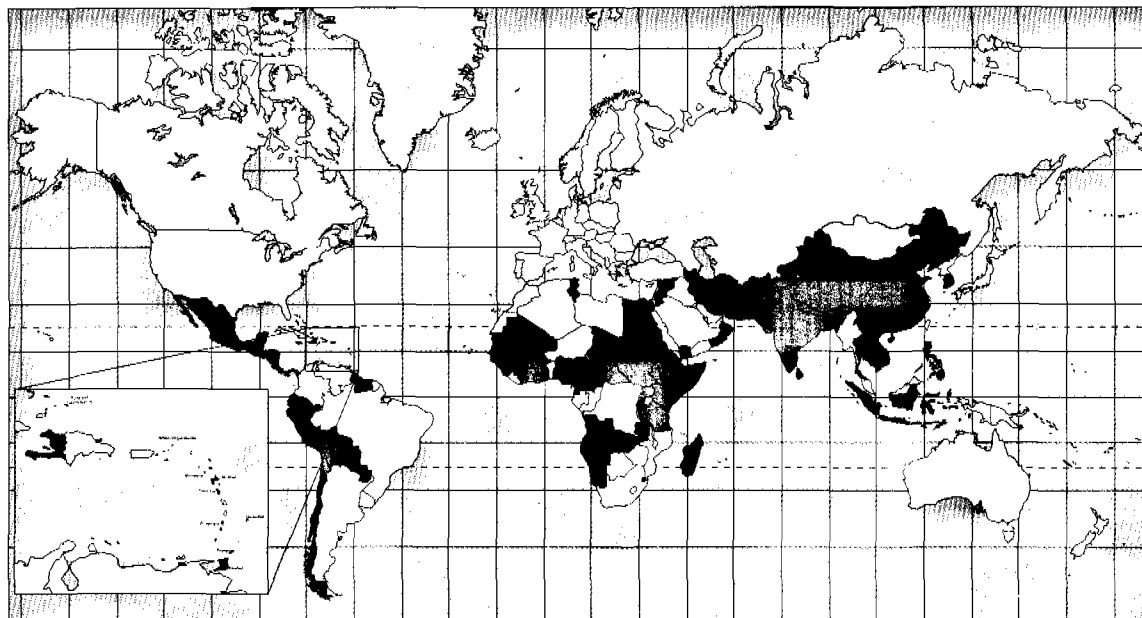
Status of Country Level JMP Implementation

Year	Number of Countries					
	Reviewed Existing Monitoring System	Convened National Interagency Review Meeting	National Monitoring Unit Established	Pilot Testing JMP Approaches	Applying Approaches National Level	Annual Reporting Undertaken
1991	18	17	16	8	5	9
1992	22	23	23	13	7	9

are being made to stimulate coordination at country level. Particularly encouraging is the increase of 44 per cent (from 16 to 23) in the number of countries reporting the establishment of National Monitoring Units. Most encouraging, however, is the 54 per cent increase (from 13 to 20) in the number of countries re-

porting the application and/or testing of the JMP approaches on either a pilot or national basis.

Examples of specific country application and some results obtained to date are included in Section IV. 🌐



MAP 1

Countries Reporting

By UN Economic Commission Regions

Source: JMP - 1991






MAP 2

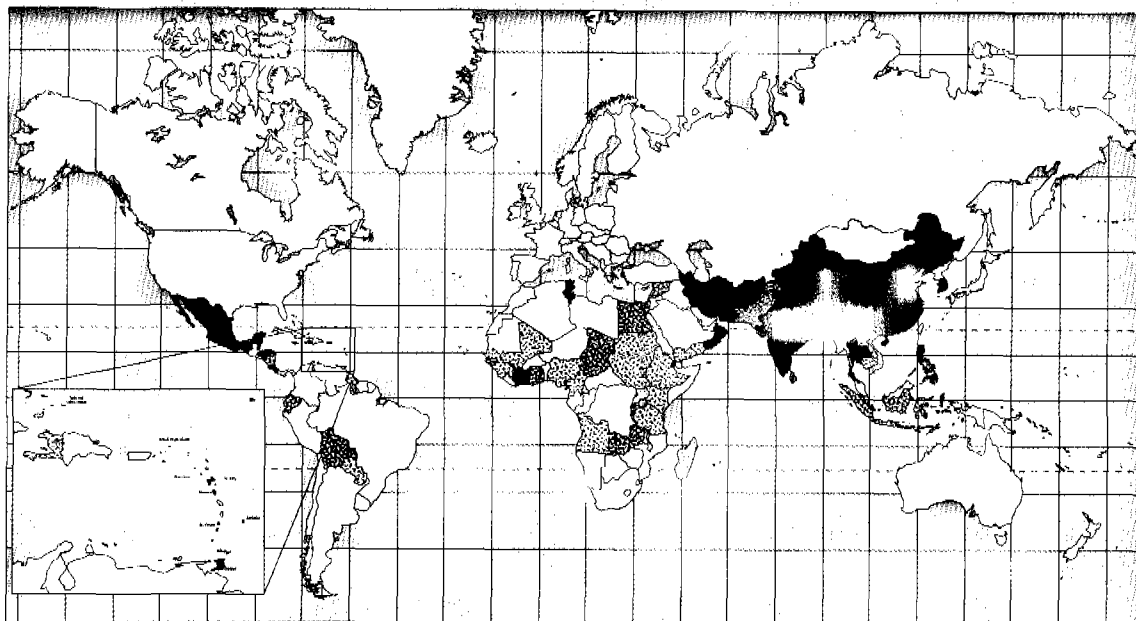
Safe Water Supply

Total population with access to functioning safe water supply.

Source: JMP - 1991

Legend

-  Not reported
-  0-25%
-  26-50%
-  51-75%
-  76-100%



Total Water Supply — Urban and Rural Combined
Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	—	40.67	—	—
Burundi	5356.26	—	—	56.74	—
Cameroon	16186.19	—	47.90	—	—
Chad	5550.00	—	—	57.37	—
Comoros	468.46	—	—	69.47	—
Cote D'Ivoire	10735.98	—	—	—	75.55
Djibouti	480.00	—	—	—	84.17
Egypt	56000.00	—	—	68.70	—
Equat. Guinea	356.10	—	34.73	—	—
Ethiopia	48728.93	—	25.35	—	—
Ghana	15000.00	—	—	52.43	—
Guinea	5604.00	—	—	52.85	—
Guinea Bissau	984.00	—	41.48	—	—
Kenya	24398.00	—	48.61	—	—
Madagascar	11200.00	22.90	—	—	—
Mali	8100.00	—	41.31	—	—
Nigeria	88500.00	—	35.83	—	—
Rep Of Tanzania	25157.00	—	48.69	—	—
Rwanda	7412.15	—	—	66.01	—
Senegal	6928.41	—	48.33	—	—
Sierra Leone	3664.00	—	36.50	—	—
Sudan	24600.00	—	47.63	—	—
Togo	3495.60	—	—	59.64	—
Tunisia	8220.00	—	—	—	99.46
Uganda	16794.00	21.10	—	—	—
Zambia	8000.00	—	—	52.98	—
Total	414679.1	2	12	8	3

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Belize	184.00	—	—	—	90.20
Bolivia	6928.00	—	—	52.09	—
Bri. Vir. Isl.	16.64	—	—	—	100.00
Costa Rica	2940.69	—	—	—	93.24
Dominica	80.00	—	—	—	95.75
Ecuador	10782.00	—	—	54.54	—
El Salvador	5250.00	—	47.43	—	—
Guyana	755.00	—	—	65.17	—
Haiti	6065.74	—	39.35	—	—
Honduras	5121.83	—	—	—	76.97
Jamaica	2400.00	—	—	—	100.00
Mexico	81100.00	—	—	—	76.08
Montserrat	22.10	—	44.53	—	—
Nicaragua	3807.00	—	—	53.20	—
Paraguay	4280.00	—	34.88	—	—
St. Kitts	34.00	—	—	—	99.88
St. Vincent	107.60	—	—	—	88.91
Trinidad & Tobago	1234.00	—	—	—	97.22
Total	131365.60	0	4	4	11

Asia & The Pacific

Afghanistan	17700.00	—	—	—	99.20
Bangladesh	110939.00	—	—	—	84.21
Bhutan	1200.00	—	34.20	—	—
Cambodia	8134.00	—	36.26	—	—
China	1143330.00	—	—	—	79.10
Cook Islands	19.00	—	—	—	100.00
India	853380.00	—	—	—	85.16
Indonesia	180000.00	—	—	50.89	—
Iran	56799.00	—	—	—	90.00
Lao	4389.00	—	36.17	—	—
Maldives	215.00	—	—	68.91	—
Myanmar	41552.00	—	31.91	—	—
Nepal	18863.00	—	41.94	—	—
Pakistan	116000.00	—	—	56.12	—
Philippines	61136.00	—	—	—	81.85
Rep Of Korea	43410.00	—	—	—	96.97
Sri Lanka	17617.00	—	—	71.21	—
Thailand	55538.00	—	—	—	77.25
Vietnam	67400.00	24.48	—	—	—
Total	2797620.00	1	5	4	8

Western Asia

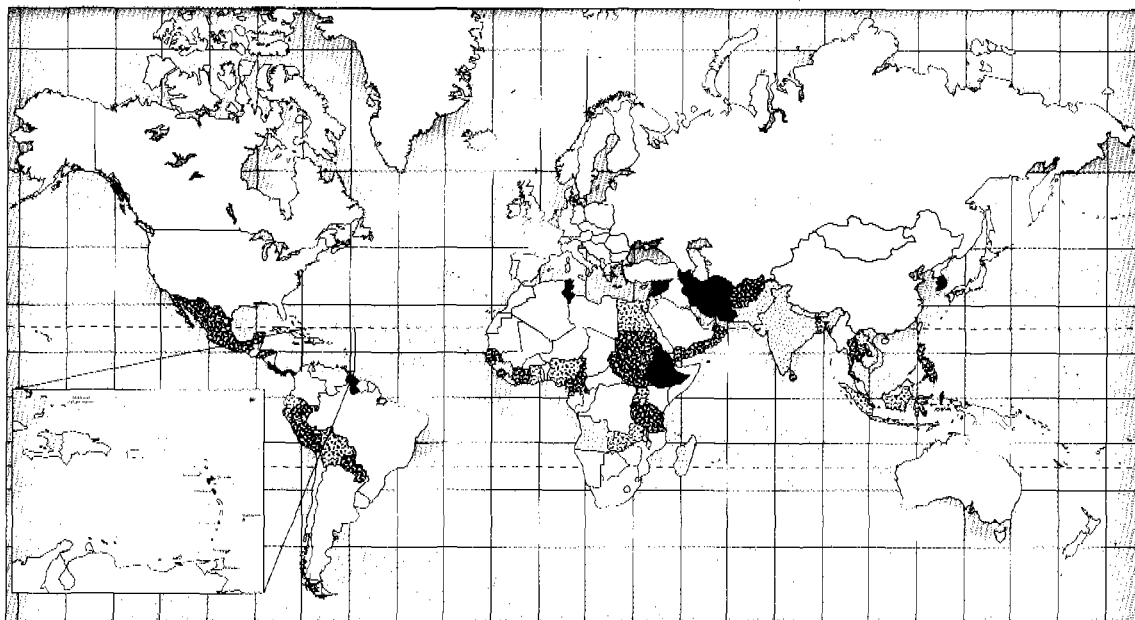
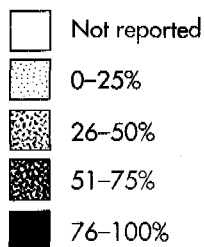
Oman	1209.00	—	—	—	84.04
Syria	12529.00	—	—	74.12	—
Yemen	10620.00	—	36.04	—	—
Total	24358.00	0	1	1	1

Sanitation

Total population with access to adequate excreta disposal.

Source: JMP - 1991

Legend



Total Sanitation — Urban and Rural Combined

Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	18.90	—	—	—
Burundi	5356.26	—	48.72	—	—
Cameroon	16186.19	—	—	73.62	—
Comoros	468.46	—	—	52.74	—
Cote D'Ivoire	10735.98	—	—	60.41	—
Djibouti	480.00	—	—	55.21	—
Egypt	56000.00	—	31.17	—	—
Equat. Guinea	356.10	—	41.47	—	—
Ethiopia	48728.93	—	—	—	75.60
Ghana	15000.00	—	41.79	—	—
Guinea	5604.00	20.95	—	—	—
Guinea Bissau	984.00	—	30.68	—	—
Madagascar	11200.00	3.00	—	—	—
Nigeria	8850.00	—	35.00	—	—
R. Tanzania	25157.00	—	—	64.21	—
Rwanda	7412.15	—	—	57.54	—
Senegal	6928.41	—	—	54.96	—
Sierra Leone	1107.94	—	—	57.65	—
Sudan	24600.00	—	—	74.82	—
Togo	3495.60	23.15	—	—	—
Tunisia	8220.00	—	—	—	96.16
Uganda	16793.00	—	31.90	—	—
Zambia	8000.00	—	37.02	—	—
Total	294424.00	4	7	9	2

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Bolivia	6928.00	—	26.47	—	—
Bri.Vir.Isl.	16.64	—	—	—	100.00
Costa Rica	2940.69	—	—	—	97.34
Dominica	80.00	—	—	—	98.81
Ecuador	10782.00	—	48.38	—	—
El Salvador	5250.00	—	—	57.52	—
Guyana	755.00	—	—	—	93.38
Haiti	6065.74	23.65	—	—	—
Honduras	5121.83	—	—	60.79	—
Jamaica	2400.00	—	—	—	89.38
Mexico	81100.00	—	—	50.18	—
Montserrat	22.10	—	—	—	83.64
Panama	2300.00	—	—	—	84.30
Paraguay	4280.00	—	—	62.03	—
Peru	22796.00	—	—	57.47	—
St.Kitts	34.00	—	—	—	99.88
St. Vincent	107.60	—	—	—	97.68
Trinidad & Tobago	1234.00	—	—	—	79.07
Total	152470.60	1	2	5	11

Asia & The Pacific

Afghanistan	17600.00	—	—	71.43	—
Bangladesh	108799.00	—	31.44	—	—
Bhutan	1200.00	13.02	—	—	—
Cambodia	8134.00	14.43	—	—	—
Cook Islands	19.00	—	—	—	100.00
India	853380.00	16.20	—	—	—
Indonesia	180000.00	—	44.39	—	—
Iran	56799.00	—	—	—	85.74
Lao	4389.00	20.94	—	—	—
Maldives	221.00	—	49.40	—	—
Myanmar	40100.00	—	35.77	—	—
Nepal	18863.00	5.90	—	—	—
Pakistan	116000.00	24.40	—	—	—
Philippines	61136.00	—	—	69.08	—
Rep Of Korea	43410.00	—	—	—	100.00
Sri Lanka	17617.00	—	—	60.22	—
Thailand	55538.00	—	—	73.96	—
Vietnam	67400.00	17.36	—	—	—
Total	1650604.00	7	3	4	4

Western Asia

Oman	1209.00	—	—	70.84	—
Syria	12529.00	—	—	—	83.02
Yemen	10620.00	—	—	65.24	—
Total	24358.00	0	0	2	1

FIGURE 1

Water Supply: Global

Proportion of population served by technology types.

Source: JMP - 1991

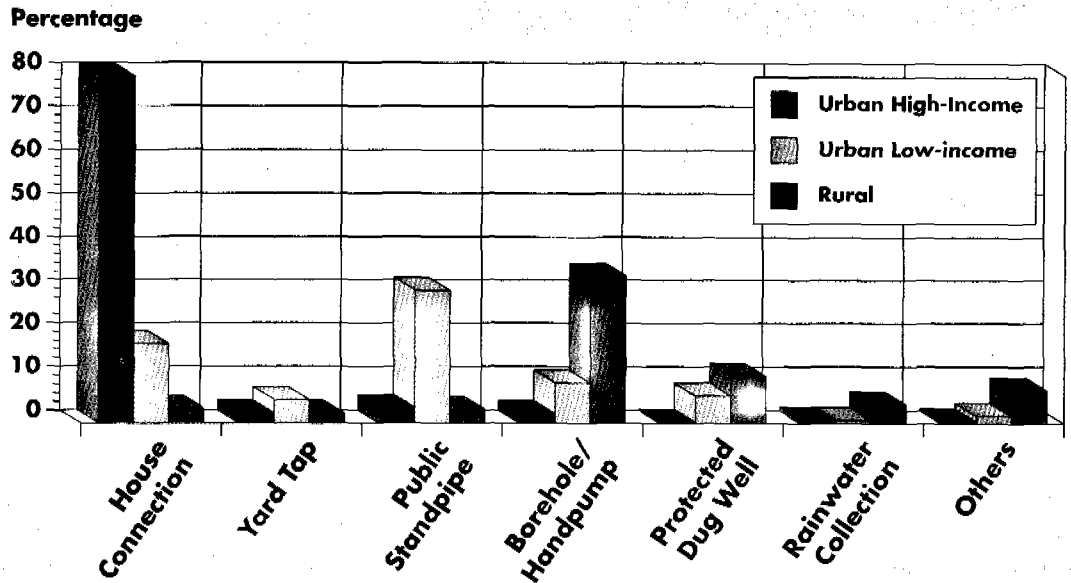


FIGURE 1A

Water Supply: Global

Number of people served by technology types.

Source: JMP - 1991

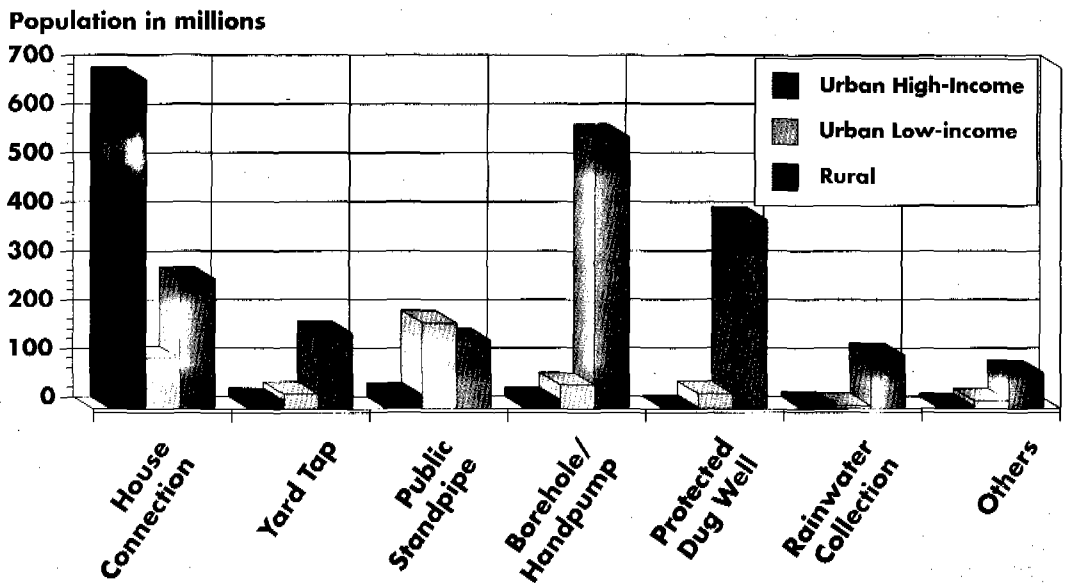
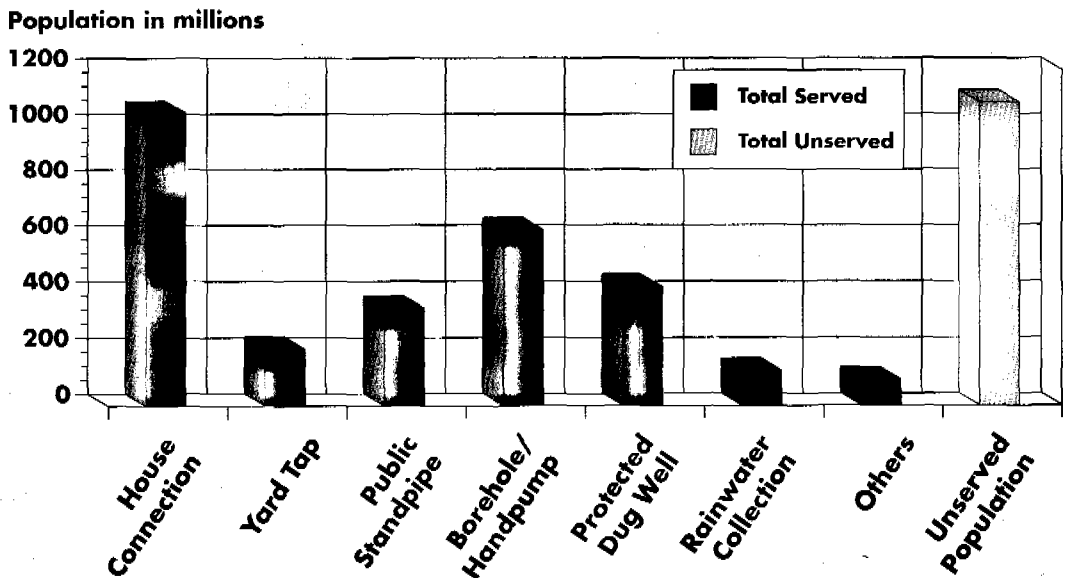


FIGURE 1B

Water Supply: Global

Total number of people served by technology types.

Source: JMP - 1991



Percentage

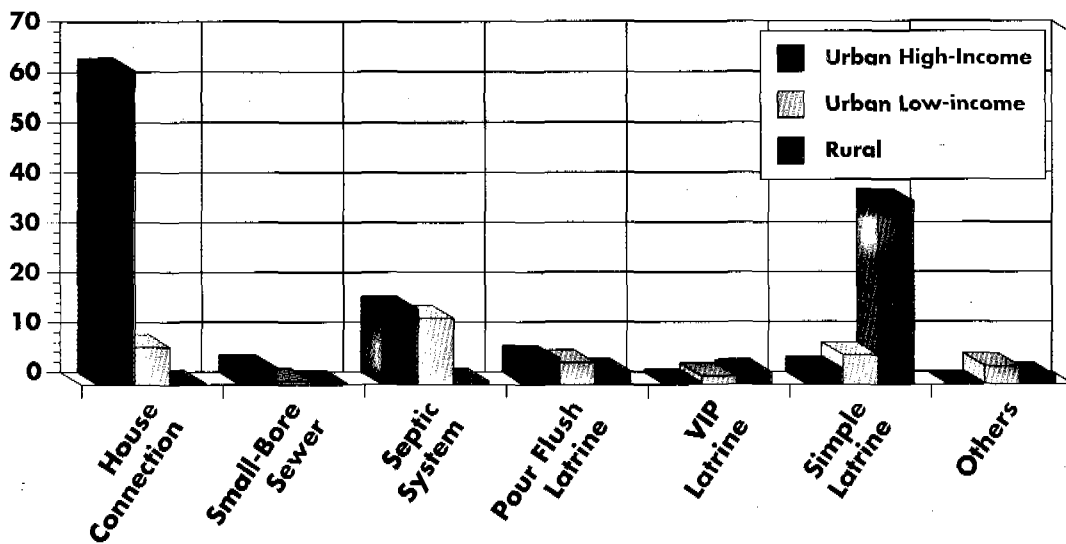


FIGURE 2

Sanitation: Global

Proportion of population served by technology types.

Source: JMP - 1991

Population in millions

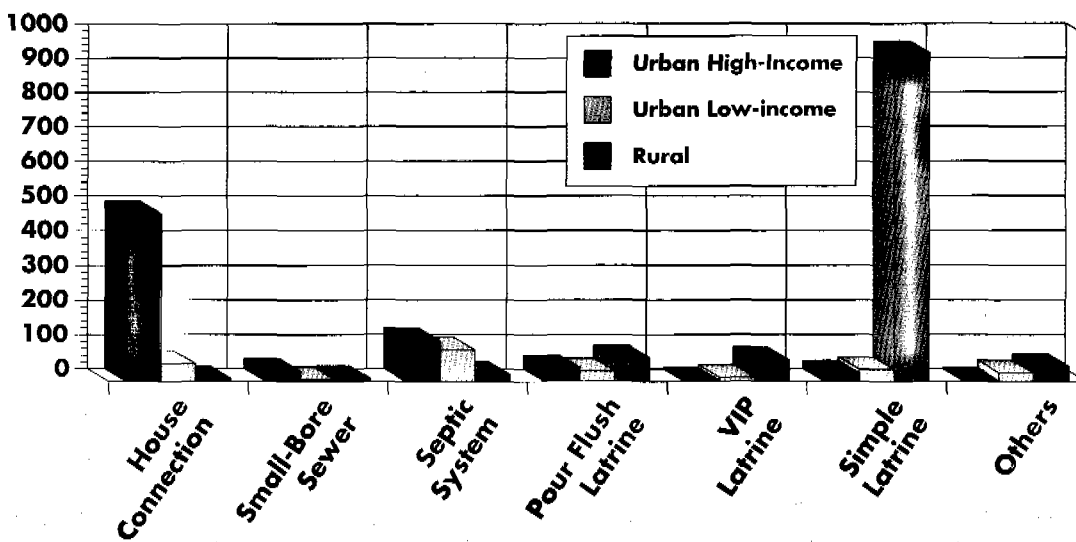


FIGURE 2A

Sanitation: Global

Number of people served by technology types.

Source: JMP - 1991

Population in millions

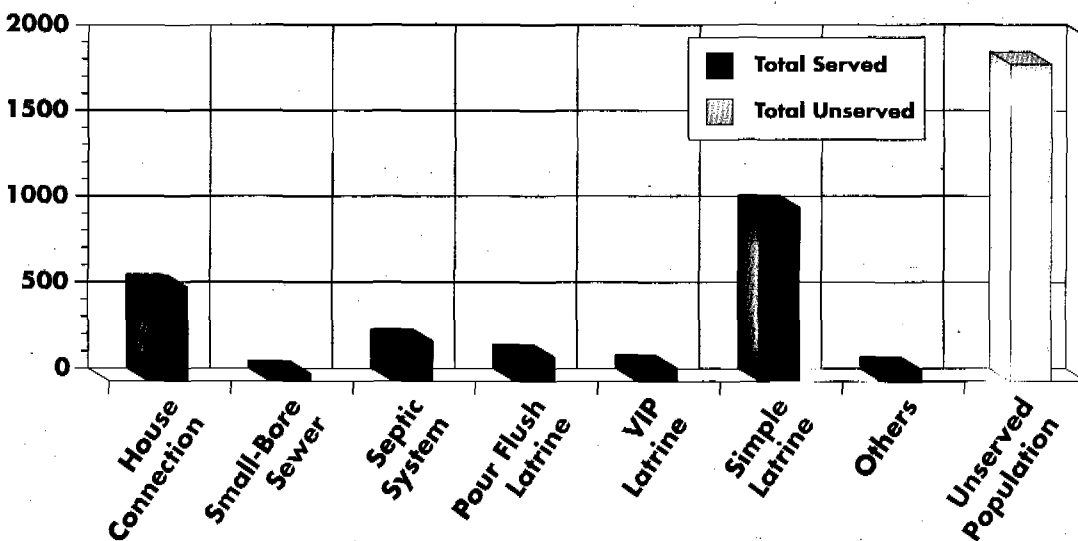


FIGURE 2B

Sanitation: Global

Total number of people served by technology types.

Source: JMP - 1991

FIGURE 3

Water Supply

Contribution to
Operation &
Maintenance

Source: JMP - 1991

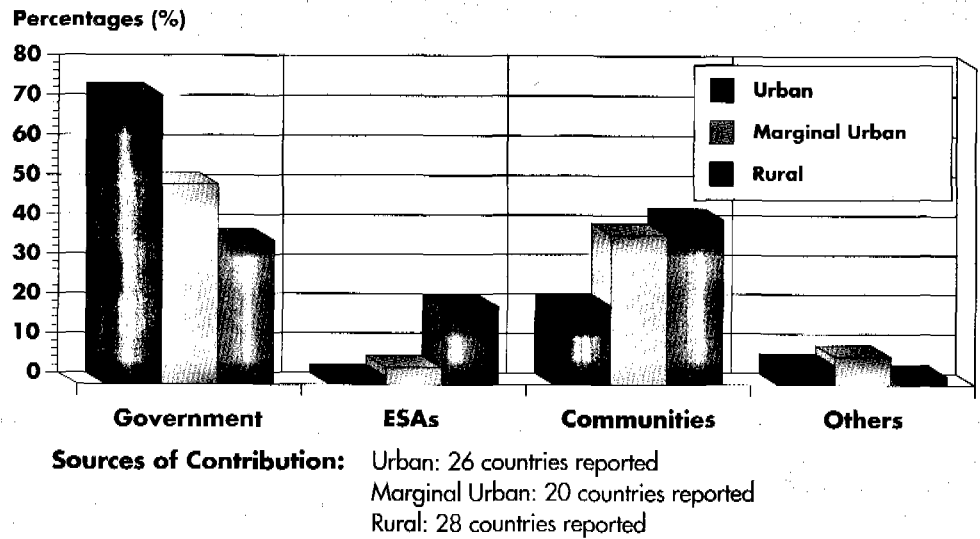


FIGURE 4

Water Supply

Contribution to
Capital Investment

Source: JMP - 1991

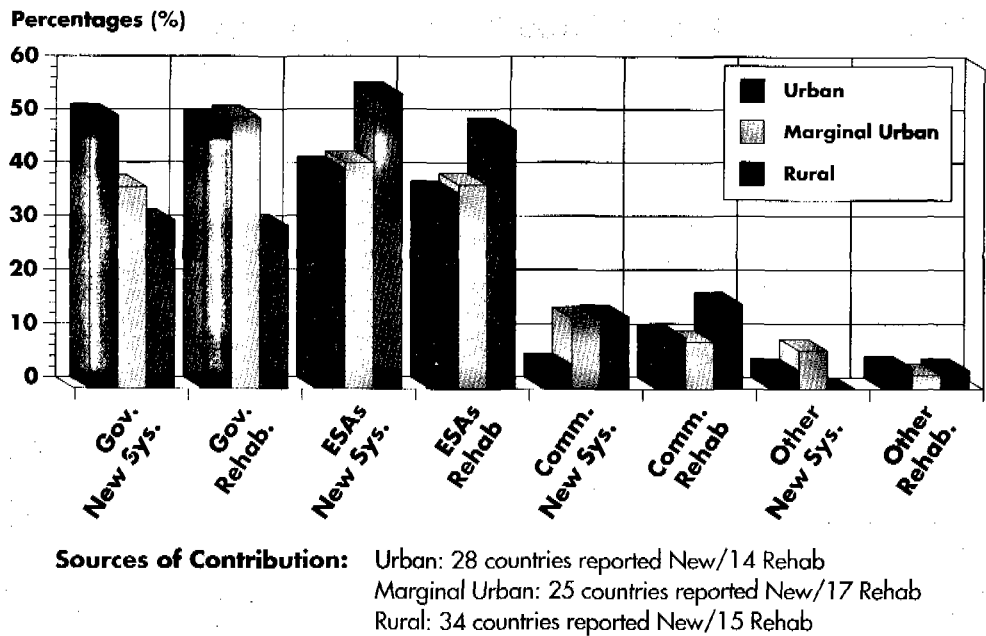
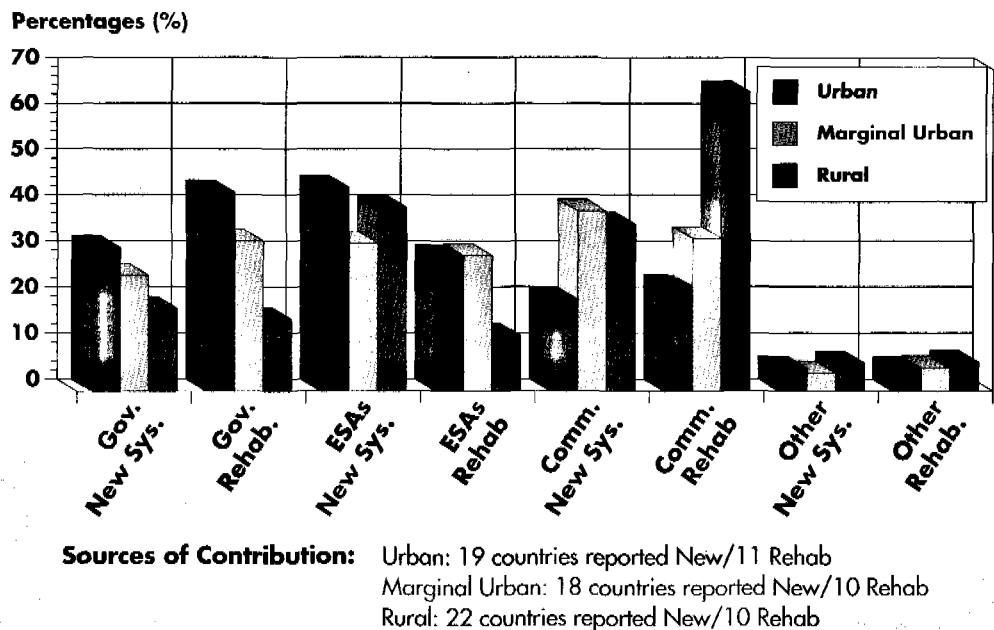


FIGURE 5

Sanitation

Contribution to
Capital Investment

Source: JMP - 1991



II. Mechanisms to Enhance Sector Monitoring at Country Level

Both the World Summit for Children and the Mid-Decade goals (supported by UNICEF and WHO), list the same indicators for monitoring national progress towards these goals. The indicators are as follows, with access interpreted as actual use by the population.

Safe drinking water coverage: Proportion of population with access to an **adequate amount** of safe drinking water located within a **convenient distance** from the user's dwelling.

Sanitary means of excreta disposal coverage: Proportion of population with access to a **sanitary facility** for human excreta disposal in the dwelling or located within a **convenient distance** from the user's dwelling.

(For both definitions above, it should be noted that the words in bold should be defined at country level).

A recent review of the water and sanitation data indicates considerable variation in national estimates over a short period of two years or less. In a number of cases the change over time is not consistent with what is known of infrastructure changes, suggesting that the estimates are based on uncertain data.

Most countries have a variety of data sources from which to estimate water and sanitation indicators, the primary division being between administrative records, population censuses and household surveys. Administrative records tend to concentrate on infrastructure and not on actual population use of water and sanitation facilities. Even in the industrialized countries, the population census has until recently been used to assess water and sanitation coverage, primarily because administrative records, on their own, were unable to provide this.

There are two main reasons for the differences in national estimates: incomplete coverage of the national population and different determination of critical components of the indicator.

In the case of water, the critical elements of the indicator are "adequate amount", "safe" and "convenient distance". How these are determined will impact on the estimates of coverage. A common approach of censuses is to determine the source of water, but this is not always specifically for drinking water. While source is often used to assess "safe", it is rare to find questions which provide information on "adequate amount" and "convenient distance".

Household surveys generally have more flexibility and can include additional questions to assess these indicator components. But this flexibility frequently leads to survey questions which differ across surveys, resulting in different estimates of water coverage, even for the same geographical area and time period.

In the case of sanitation, the critical elements of the indicator are "sanitary facility" and "convenient distance". Censuses have been used to determine the type of facility used by a household, but rarely the convenience element. For household surveys the situation is similar to that for water, where added flexibility in survey questions increases the number of different classifications of sanitary facilities.

Nevertheless, progress is being made in improving the measurement of water and sanitation coverage. Censuses, previously a main source of such data, are giving way to a wide variety of household surveys, from major post-census surveys, through demographic and multi-purpose sample surveys, to sentinel site and community based mechanisms. Such surveys generally produce more timely estimates than do population surveys.

But the existing data are not yet being adequately used. One example is provided by the Demographic and Health Surveys (Macro International) where 44 developing countries have been surveyed between 1986 and 1993, some more than once. These sample surveys used a similar core questionnaire across all countries, with the addition of optional modules for some. Virtually all surveys carry ques-

A recent review of the water and sanitation data indicates considerable variation in national estimates over a short period of two years or less.

In the case of sanitation, the critical elements of the indicator are "sanitary facility" and "convenient distance".

tions on water and sanitation facility coverage, and often include a question on time taken to collect water. But these data rarely appear in either the preliminary or the final survey reports, though they are included in the survey data file for subsequent analysis and use.

Another and even larger source of data are the household surveys carried out by national organizations, which frequently include questions on water and sanitation use. Even when such questions are either not included in the questionnaires, or additional ones are needed, it is often feasible to add a short module of relevant questions to the survey.

Where no suitable existing data collection mechanism exists, a custom built household survey can be developed, as was done for deriving immunization coverage estimates, where household cluster surveys played a major role. But custom built surveys should be used only as a last resort at the national level since monitoring progress requires periodically repeated measurements, and such sur-

veys are often not sustainable without external funds.

The situation for monitoring progress in water and sanitation at the sub-national level is similar to that at the national, though frequently with a wider variety of surveys. Such a variety can increase the difficulty of comparing progress over time and across sub-national areas.

In summary, there is considerable scope for improving water and sanitation indicator data within country through the utilization of existing data and existing data collection mechanisms. But further development of instruments is needed to improve the measurement of the previously mentioned critical indicator elements. While the priority for measurement of progress is within country rather than between countries, development of instruments across countries can benefit individual countries through their access to a wider range of related experiences. ⊕

III. Analysis of Data Received for the End of 1991

Representativeness of Data

Data used in this report to determine the water supply and sanitation situation were provided by governments which participated in the second global reporting effort in 1992. The countries reporting are listed in Table 2 and are indicated on Map 1. The overall level of reporting in regional terms is presented in Table 3 from which an indication of the representativeness of the sample can be determined. A total of 82 countries were able to provide data out of 130 to whom the questionnaire was sent, thus giving a return rate of approximately 63 per cent. In total this represents an estimated 55 per cent of developing countries constituting 76 per cent of their total population.

For 1991 several countries reported the same or similar information as for 1990, indicating that during the course of a year there had been no significant change. This is particularly the case with regard to service coverage and the types of technology applied. Considering the construction period required for major water supply and sanitation projects this is a foreseeable response.

On the basis of experience gained in collecting data for the first JMP report (at the end of 1990) the approach to collecting data and the format of the questionnaire were amended. These changes were introduced to facilitate completion of the report and in response to needs identified at country level and at the series of regional workshops convened in 1991 and 1992.

For 1991 several countries reported the same or similar information as for 1990, indicating that during the course of a year there had been no significant change.

TABLE 2

Countries Reporting By UN Economic Commission Regions

Africa	Angola Burkina Faso Burundi Cameroon Cen. Afr. Rep. Chad Comoros Côte d'Ivoire Djibouti	Egypt Equatorial Guinea Ethiopia Gambia Ghana Guinea Guinea Bissau Kenya Liberia	Madagascar Mali Mauritania Namibia Nigeria Rwanda Senegal Sierra Leone Somalia	Sudan Swaziland Tanzania Togo Tunisia Uganda Zambia
Latin America & Caribbean	Barbados Belize Bolivia Brit. Virgin Is. Chile Costa Rica Dominica	Ecuador El Salvador Guatemala Guyana Haiti Honduras Jamaica	Mexico Montserrat Nicaragua Panama Paraguay Peru St. Kitts & Nevis	St. Vincent Surinam Turks & Caicos Trinidad & Tobago
Asia & Pacific	Afghanistan Bangladesh Bhutan Cambodia China	Cook Islands India Indonesia Iran Lao P.D.R.	Maldives Myanmar Nepal Pakistan Philippines	Rep. Korea Sri Lanka Thailand Vietnam
West Asia	Jordan	Oman	Syrian Arab Rep. Yemen Arab Rep.	

In the case of management and funding, either the information does not exist or it is so dispersed that it is difficult to consolidate and/or estimate at the national level.

The ability of countries to complete the different parts of the questionnaire i.e. **coverage, management, and funding**, continues to vary greatly. Similar to 1990, the least difficulty was experienced in providing information on service coverage, while greater difficulty persisted with regard to the collection of data on management and funding. Thirty-three countries were able to complete more than 50 per cent of the information requested on coverage, whereas only 13 did the same for management and 16 for funding. It would appear that national authorities either know or feel more competent to estimate the proportion of the population with access to services. Whereas, in the case of management and funding, either the information does not exist or it is so dispersed that it is difficult to consolidate and/or estimate at the national level. The lev-

els of reporting on the three sections of the questionnaire are presented in Table 4. Out of the 82 reporting countries, 35 could provide no information on **Funding** (contribution to capital investments), and 41 were not able to provide any information on **Management** (contribution to operations and maintenance costs, O&M).

As in the case of 1990 the analysis and presentation in this report is done in accordance with the UN Economic Commission Regional sub-divisions.

Although the majority of reporting countries had least difficulty in completing the questions related to coverage, many continue to be unable to disaggregate the urban population into high-income and low-income/marginal groupings (Table 5). However, in 1991 slightly more countries were able to provide

TABLE 3

Level of Reporting by Region
By UN Economic Commission Regions

	Africa	Latin America & Caribbean	Asia & Pacific	West Asia	Global
Percentage of Countries Reporting	70	55	44	33	55
Percentage of Population Represented	61	38	87	38	76

TABLE 4

Reporting by Information Category

Proportion of Questionnaires Completed	Number of Countries Reporting		
	Coverage	Management	Funding
0%	1	41	35
1-10%	4	10	14
11-20%	11	4	7
21-30%	7	1	4
31-40%	9	6	6
41-50%	19	9	3
51-60%	3	1	0
61-70%	3	8	9
71-80%	2	2	2
81-90%	2	0	0
91-99%	6	0	0
100%	17	2	5

such disaggregated data than did so for the first JMP report. This may indicate a rising awareness of the potential usefulness of such a breakdown for planning and management.

Urban High-Income Populations are those perceived locally to have access to a good standard of dwelling expressed in quality of construction and access to services, whereas *Marginal or Low-Income Populations* are those that clearly do not fit into these provisions in terms of quality of dwelling construction and/or access to services.

As previously reported for 1990, some countries continued to be unable to provide coverage information disaggregated by technology categories; an assessment of the quality/levels of services cannot be undertaken in

these cases (Table 6). However, a total of 67 countries were able to provide such a breakdown for water supply and 63 were able to do so for sanitation.

Clearly, if monitoring is to develop and become a useful tool for the planning and management of the water supply and sanitation sector, national capabilities have to be developed in terms of infrastructure and personnel. This will enable the necessary information gaps to be filled and the necessary disaggregation of information in terms of technologies, population groups and national administrative subdivisions to be undertaken on a routine basis.

The fact that several countries reported the same information for 1991 as for 1990 is a possible indication that the frequency of data

Clearly, if monitoring is to develop and become a useful tool for the planning and management of the water supply and sanitation sector, national capabilities have to be developed in terms of infrastructure and personnel.

TABLE 5

Respondents' Ability to Provide Disaggregated Data on Urban Water Supply & Sanitation Coverage by Marginal and High-Income Populations

Region	Number of Reporting Countries	
	Providing Urban High-Income/Marginal Urban Breakdown for Water Supply	Providing Urban High Income/Marginal Urban Breakdown for Sanitation
Africa	18	19
Latin America & The Caribbean	9	11
Asia & Pacific	10	10
West Asia	3	3
Total	40	43

TABLE 6

Respondents' Ability to Provide a Breakdown of Service Coverage by Different Technologies

Region	Number of Reporting Countries	
	Providing Service Coverage Breakdown by Different Technologies for Water Supply	Providing Service Coverage Breakdown by Different Technologies for Sanitation
Africa	29	27
Latin America & The Caribbean	19	19
Asia & Pacific	16	14
West Asia	3	3
Total	67	63

An analysis in terms of both the proportion and the number of people served and/or unserved provides the possibility of identifying inequities through differences in proportion of population served, as well as identifying where most has to be done in reaching the maximum number of unserved.

collection within the framework of any national monitoring system depends to a large extent on the rate of sector development at any particular point in time. Monitoring offers an opportunity for savings which far outweighs its cost. However data collection is one of the more expensive elements of monitoring and should not be undertaken when there are good grounds to believe that a relatively static situation exists.

Analysis of 1991 Situation

Coverage

In the first JMP report on the situation of the sector at the end of 1990, the analysis was made on the basis of the proportion of people with access to services provided through different technologies, i.e., urban high-income, urban low-income/marginal, and rural. Although this enabled an overview of the situation to be obtained it did not, however, provide an indication of the magnitude of the problem. To do the latter, an analysis based on the **number** of the different categories of people served by different types of system has to be undertaken. For this reason, the following summary includes an analysis in terms of both the proportion, on the one hand, and the number of people served and/or unserved on the other hand. Such an approach provides the possibility of identifying inequities through differences in proportion of population served, as well as identifying where most has to be done in reaching the maximum number of unserved. The figures provided in this section of the report contain information on the global situation. In Annex III, additional figures are provided with regional information to enable readers to analyse the situation of most interest to themselves.

The analysis below follows the same order as that contained in the first JMP report. This should enable a comparison of the 1990 and 1991 information and also help to identify consistencies or inconsistencies in reporting. This analysis is not intended to be comprehensive but rather to be **indicative** of the type of information which can be derived from the monitoring data.

A clear understanding of definitions in any monitoring exercise is essential. In the analysis of the 1990 results, a surprisingly high proportion of people having access to small-bore sewers was reported, the validity of this was

therefore queried. At that time it was felt that the explanation was one related to variations in interpretation of the definition of a small-bore sewer. It is interesting to note that the proportion of people with access to small-bore sewers reported in 1991 has significantly reduced when compared to the 1990 report (Fig. 2). The 1990 data showed that around 20 per cent of urban high-income and low-income residents have access to such a service, while in 1991 the reported proportion dropped to around 2 per cent, a more realistic level.

To further assist in overcoming these difficulties caused by misunderstanding of definitions, a booklet is under preparation in which the technologies used in the questionnaires are described by a series of sketches accompanied by their names in Arabic, English, French, Portuguese and Spanish.

From Fig. 1, with global information presented as a percentage of population served with a safe water supply, it becomes clear that considerable inequity exists between the urban high-income and the urban low-income populations. This situation is to be expected, i.e. about 80 per cent of the urban high-income people have water provided through a house connection, while less than 20 per cent of their low-income neighbours have access to such a high level of service, and less than five per cent of the rural population are thus served. A slightly different picture appears if the *number* of people served is considered (Fig. 1A), about 675 million urban high-income residents have been provided with a house connection, compared to around 105 million low-income people, while about 270 million rural dwellers are reported to have such a level of service. Also by looking at the actual numbers of people served by the different technology types rather than the proportion of the population served by them, a picture emerges of the significance of the different systems in providing services. Today globally (Fig. 1B) only just over 1000 million people in developing countries have house connections, with a further 200 million served by yard-taps, and about 350 million served through public stand-posts. Thus, approximately 1550 million in total are served through a piped supply. On the other, hand protected dug wells and boreholes with handpumps together provide services to somewhat more than 1000 million people. Clearly on site use of groundwater is a major source of

water supply in developing countries. Nonetheless, this still leaves over 1000 million unserved.

A similar review of Figs. 2, 2A, and 2B provides the corresponding information for sanitation. A significant indication from this analysis is that simple pit latrines are still the most common method for excreta disposal in developing countries, and provide for about 1000 million people. Meanwhile, approximately 550 million people have access through a house connection to a public sewer. Of those served by this high level of service, almost 500 million (over 90 per cent) are high-income urban residents.

The regional information contained in Annex III has been presented in a fashion similar to the global data to facilitate the identification of the situation as it exists in each region while enabling comparisons to be made between and among regions. In Africa public standposts provide services to 60 million people (Fig. III-2.2) compared to approximately 85 million having a house connection. The situation in Latin America and the Caribbean is completely different (Fig. III-9.2) with an estimated 325 million having access to a satisfactory water supply while 130 million are without such a service. Of those served, by far the largest number, around 250 million, is provided through a house connection. (Fig. III-1.3). Clearly the methodologies and strategies for expanding and sustaining coverage in Africa and the Americas will be very different.

In the case of Western Asia, as with Latin America and the Caribbean, the large majority of people (70 per cent) have water service through a house connection (Fig. III-3.3). In the case of sanitation approximately 85 per cent have an indoor flushing toilet connected to a conventional sewer, a small-bore sewer or a septic system in Western Asia. It would appear that any future strategy to improve services would hopefully give priority to providing an adequate and safe water supply to the 30 per cent currently unserved. Most of these unserved are in the rural areas, where the present predominant technologies are public stand posts, handpump-equipped boreholes and protected dug wells.

The situation in the Asian and Pacific Region has some similarities to Africa in so far as boreholes with handpumps and dug wells

appear to provide a significant proportion of the safe water supply (Fig III-4.2). Similarly, simple pit latrines provide much of the excreta disposal facilities (Fig III-8.3). However, unlike Africa, in numerical terms Asia and Pacific Region has twice as many unserved with water, and four times as many unserved with sanitation. For safe water supply, these figures represent only about 22 per cent as unserved population, and for sanitation, 47 per cent without access to an appropriate means of excreta disposal in Asia and the Pacific Region (Fig. III-10.1). Conversely, in Africa the proportion unserved is a little over half of the population.

The above examples give an indication of the type of analysis which can be undertaken on the basis of the data provided through the JMP approach. In this report the information considered is global, with regional examples. However, the main advantage to be gained will be at country level, where several countries (including Togo, Benin, and Uganda) are already collecting monitoring data at one administrative level down from central government.

Management

The analysis of the 1991 information on the levels of funding for operation and maintenance confirms the findings derived from the 1990 statistics. Governments are subsidizing water systems and sanitation services to the better-off populations by around 70 per cent of recurrent costs as compared to approximately 50 per cent towards the lower levels of service provided to the urban low-income/marginal areas, and less than 40 per cent of the much lower operation and maintenance costs (O&M) in the rural areas (Fig. 3). In urban areas, governments provide a larger proportion of the costs of running the systems than either the communities themselves or the external support agencies. Communities appear to contribute most to O&M in rural areas where external support agencies are also most active.

In terms of actual funds allocated to O&M, available information is very meager. However it is clear that unless funds are increased significantly, systems sustainability will not be attained in most instances.

A major challenge for national monitoring systems will be to improve their capacity to collect information on the funding of O&M in order to properly assess future needs. Without

In the case of Western Asia, as with Latin America and the Caribbean, the large majority of people (70 per cent) have water service through a house connection; in the case of sanitation, approximately 85 per cent have an indoor flushing toilet connected to a conventional sewer, a small-bore sewer or a septic system.

In general, governments appear to give higher priority to the funding of water supply than to sanitation.

this information it is questionable how sustainability will be assured.

Funding

According to the information provided by countries at the end of 1991, priority of investment in water supply and sanitation has continued in the urban sector. Moreover, the bulk of this funding has been directed towards the better-off population. It is hoped that, as the number of countries reporting disaggregated data between urban high-income and urban low-income populations increases, a clearer picture of the actual sums involved will be obtained.

It is of interest to note that most countries provided data on funding to urban low-income, urban high-income and rural sectors only in terms of percentages. For this reason it was possible to compare the significance of inputs of government, communities and external support agencies within any one population group. However, it was not possible to compare the differences in the magnitude of funding among these population groupings. (Figs. 4 & 5).

In general, governments appear to give higher priority to the funding of water supply than to sanitation. In the first instance they provide approximately 50 per cent of the funding for new systems in urban high-income areas, while they provide only around 30 per cent of the funding for sanitary facilities in these areas.

It is also worth noting that in rural areas, the communities appear to contribute 36 per cent to the cost of new sanitation investments while governments contribute less than 20 per cent. In rural areas, external support agencies (ESAs) appear to be the major contributors to new investments in sanitation facilities with 40 per cent of the allocations, slightly ahead of the funding provided by the beneficiaries themselves.

The main conclusion to be drawn from the present levels of reporting on O&M and funding is that governments are continuing to highly subsidise both the construction and the O&M of water supply and sanitation services to high-income urban residents. Although some subsidies are provided to the urban low-income and rural populations, these are less significant in absolute figures than those provided to the high-income populations. It is hard to justify subsidies to those already served and who can afford to pay for such services while many of the poorer members of the community in developing countries are without satisfactory services. As stated in the 1990 report, the need exists to promote financial restructuring of the sector.

Also, the need clearly exists for better information on funding of construction and O&M of water supply and sanitation systems in order to improve planning and management. ☉

IV. Country Level Application

Benin: A Workshop Follow-up

In September 1992 Benin hosted the JMP Sub-regional Workshop for Central and West Africa, which brought together countries of that region to review existing monitoring activities, consider methodologies and identify material needs. As a direct follow-up, in less than a year since the workshop, Benin has undertaken a major effort to establish a monitoring network with the ability to collect information on the status and funding of water supply and sanitation services at the Provincial and Departmental levels, i.e. one level below central government. Benin comprises six Provinces/Departments, and is one of the sev-

eral countries which has established a national water supply and sanitation monitoring network designed to collect information from the first administrative level below central government.

Data has now been collected showing the situation of the sector as at the end of 1992. This provides a basis for more rational planning for sector development in the future. The two figures below (Fig. 6A & 6B) give at a glance some of the basic information generated by such monitoring. Information of this sort, if broken down by administrative units not only for coverage but also for management and funding, provide the potential for improved sector management.

Benin has undertaken a major effort to establish a monitoring network with the ability to collect information on the status and funding of water supply and sanitation services...

Population (in thousands)

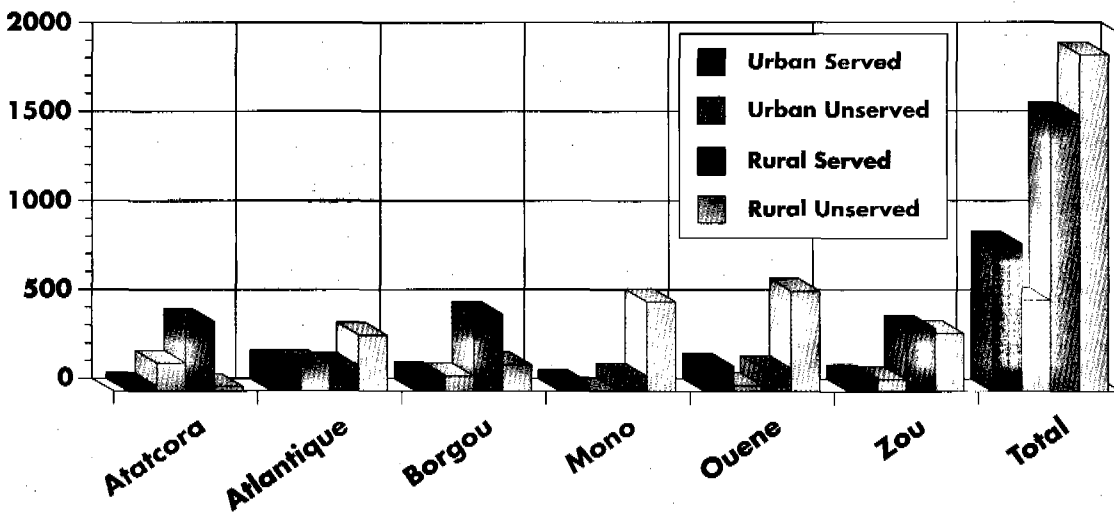


FIGURE 6A

Water Supply: Benin

Number of people served/unserved by provinces

Source: JMP - 1991

Population (in thousands)

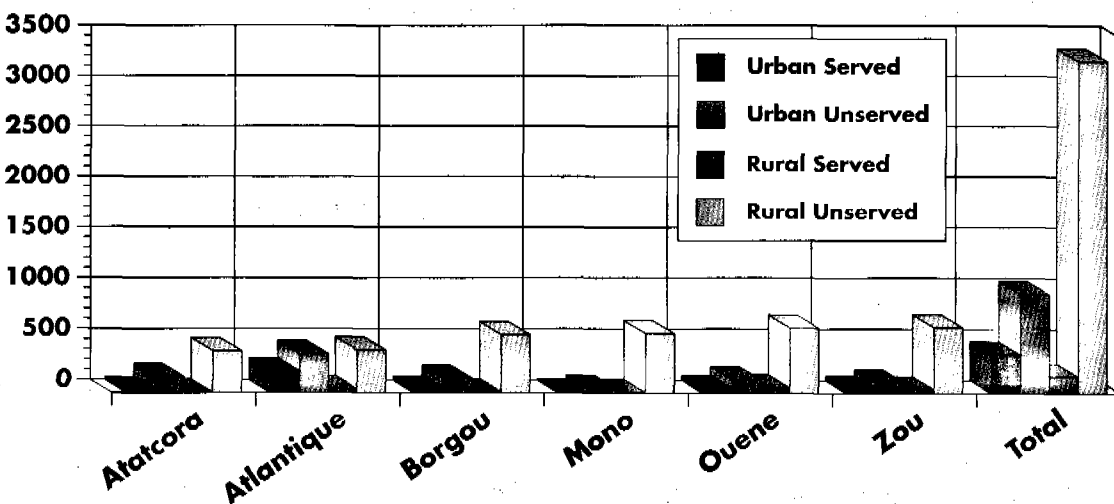


FIGURE 6B

Sanitation: Benin

Number of people served/unserved by provinces

Source: JMP - 1991

It was recognized that enhancement of the sector monitoring process required adequate planning of activities, strengthening of the data collection process, development of an information network, systematic evaluation and analysis, and consequent action.

From these figures, some of the initial conclusions can be derived at:

Water

- Out of a total population of 4.8 million, 2.4 million (or half the population) are without a safe and adequate water supply.
- The Department of Ouene has the largest number of rural unserved, 562000, closely followed by Mono with 505000.
- Of the 513000 urban people without services, 320000 are in the Departments of Atacora and Atlantique.

Sanitation

- Out of a total population of 4.8 million, 4.2 million are without access to an appropriate means of excreta disposal.
- The Departments of Ouene and Zou have the highest number of rural unserved at about 650000 each, which represents in the case of Ouene 92 per cent of the rural population.
- Although the Department of Atacora has the lowest number of rural unserved, 412000, it has the highest proportion of unserved, i.e. 98 per cent.
- Forty per cent of the urban unserved are in the Department of Atlantique, which contains the national capital, Cotonou.

As monitoring capacity develops in Benin and the results are applied to the planning process, the need for other information will become clear, e.g., data on water-related diseases to target areas and/or groups at risk, etc.

In support of this national initiative, WHO has already earmarked funding for capacity building through a training workshop for network staff from the Departments and Provinces. Planning of this activity and assessment of other needs are being undertaken jointly by UNICEF and WHO/AFRO. A key to success in such programmes is collaboration and partnership at the country level.

Bolivia: Taking Decisive Steps

Background

The outcome of the assessment on progress made by all countries in the Latin American region during the International Drinking Water Supply and Sanitation Decade (IDWSSD)

shows that, despite the efforts made by governments, the goal of universal access to water supply and sanitation by 1990 was not achieved.

Given the importance of this mandate to the overall development of the countries in the region of the Americas, there is a consensus to extend the goal of universal access beyond 1990, thus re-targeting it to the year 2000. This new thrust includes improvement in sector management, increase in funding levels and acceleration in the implementation of plans, programmes and projects.

During the preparation of Bolivia's National Plan for Drinking Water and Sanitation 1992-2000, several deficiencies were perceived in the areas of project management and information systems.

It was recognized that enhancement of the sector monitoring process required adequate planning of activities, strengthening of the data collection process, development of an information network, systematic evaluation and analysis, and consequent action. The monitoring process was to be developed within a wide context, in order to influence national institutional structures and to strengthen capacities at the country level.

Actions taken

Bolivia was represented at the first WHO/UNICEF-sponsored Joint Monitoring Programme workshop held in Guatemala City, December 1991, by delegates from the National Association of Enterprises of Drinking Water and Sewerage Services (ANDESAPA), UNICEF, and WHO/PAHO. Recommendations derived from the workshop were shared by UNICEF with the Ministry of Urban Affairs, which serves as the Head Ministry for the Basic Sanitation and Environment Sector, through the National Office for Basic Sanitation (DINASBA). UNICEF also offered to join efforts with ANDESAPA to promote the implementation of enhanced sector monitoring in Bolivia by adapting and applying the WHO/UNICEF-produced Water and Sanitation Monitoring System software (WASAMS).

The Ministry of Urban Affairs and the Federal Government prepared the National Plan for Drinking Water and Sanitation, 1992-2000 (known as "Water for All"), and determined the need to establish a monitoring system to evaluate progress made towards the objectives

outlined in the plan. In June 1992 a group of consultants was commissioned for a five-month period to set the basis for the introduction of a national sector monitoring system and a comprehensive information management system based on WASAMS. UNICEF Bolivia contributed to this study by donating a computer and a printer to DINASBA. In March 1993 the working group was brought together again for an additional five-month assignment to continue the project started the previous year. Its tasks were as follows:

- Prepare a project proposal, for inclusion in the National Action Plan, for the development and implementation of a Water and Sanitation Sector Monitoring System containing short, medium and long-term goals and objectives.
- Determine the geographical structure of the rural and urban communities, taking as a basis for the coding system established by the WASAMS computer package.
- Collect coverage data from institutions and organizations involved in basic sanitation. To execute this phase, field visits would be made to those institutions and agencies.
- Process information on coverage and enter all data into the computer.
- Conduct field visits to promote the advantages of the WASAMS computer package among regional development agencies in

seven districts throughout the country. During such field visits, service coverage data were collected from the regional and local organizations in charge of the provision of water and sanitation services. The information gathered was complemented with data from the National Statistics Institute's 1992 population census.

In April 29-30, 1993 a national workshop took place in the city of Cochabamba, gathering together 80 per cent of the agencies involved in the basic sanitation sector. On that occasion, the national Program of Action for Water and Sanitation Sector Monitoring and the WASAMS computer package were presented to the participants. They were briefed on progress made in the area of sector monitoring and were urged to support the proposed national plan. Representatives from the participating agencies agreed to work jointly in the development and implementation of the information system.

Achievements

Identification and coding of the country's localities have been carried out with data from the 1992 population census. All localities have been coded with the sole exception of some 40 per cent of the communities in the Department of Oruro. (Table 7)

Thus, out of a total of possible 12000 codifications for the country, 95 per cent of all localities has been processed to date.

During field visits, service coverage data were collected from the regional and local organizations in charge of the provision of water and sanitation services.

TABLE 7

A Perspective of Progress Made to Date: Localities Coded and with Coverage Data

Department	Provinces	Cantons	Coded Localities		Localities with Coverage Data
			Numbers	Per Cent	
Choquisaca	10	117	964	100	100
La Paz	18	229	2054	100	19
Santa Cruz	13	120	1078	100	40
Cochabamba	14	85	1324	100	14
Tarija	6	176	596	100	490
Potosi	15	220	1622	100	20
Oruro	11	132	808	60	1
Beni	8	32	626	100	10
Pando	5	10	445	100	1
Total	100	1121	9517	95	695

Bolivia has initiated its efforts to upgrade sector monitoring by focusing on the urban sector

Future actions

Regional Committees for Sector Monitoring will be established as part of a joint effort with the government and NGOs. These committees will perform the following tasks:

- Coordinate the implementation of the Water and Sanitation National Plan, 1992-2000
- Provide technical, economic, financial, and managerial support to programmes and projects outlined in the National Plan.
- Launch and promote activities/elements aimed at sector enhancement such as management directives, finance, information

systems, technology, training, health education and community participation.

Bolivia has initiated its efforts to upgrade sector monitoring by focusing on the urban sector and has in particular focused on both water supply and sanitation for the capital cities of the country's nine Departments. In the case of water supply (Fig. 7A), data were collected for seven of the nine cities, while for sanitation data were obtained on five cities. (Fig. 7B).

In Bolivia, for the moment, no effort has been made to disaggregate coverage figures by technology, or to differentiate between urban high-income and urban low-income/marginal

FIGURE 7A

Water Supply Service Coverage

Departmental Capitals of Bolivia

Source: JMP - 1991

Number Served (thousands)

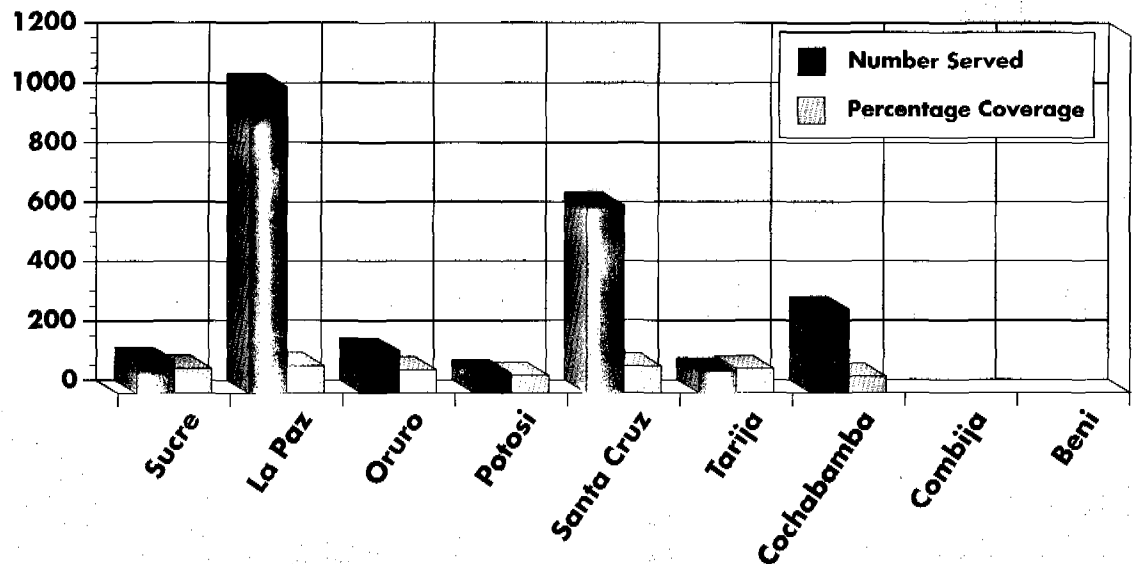


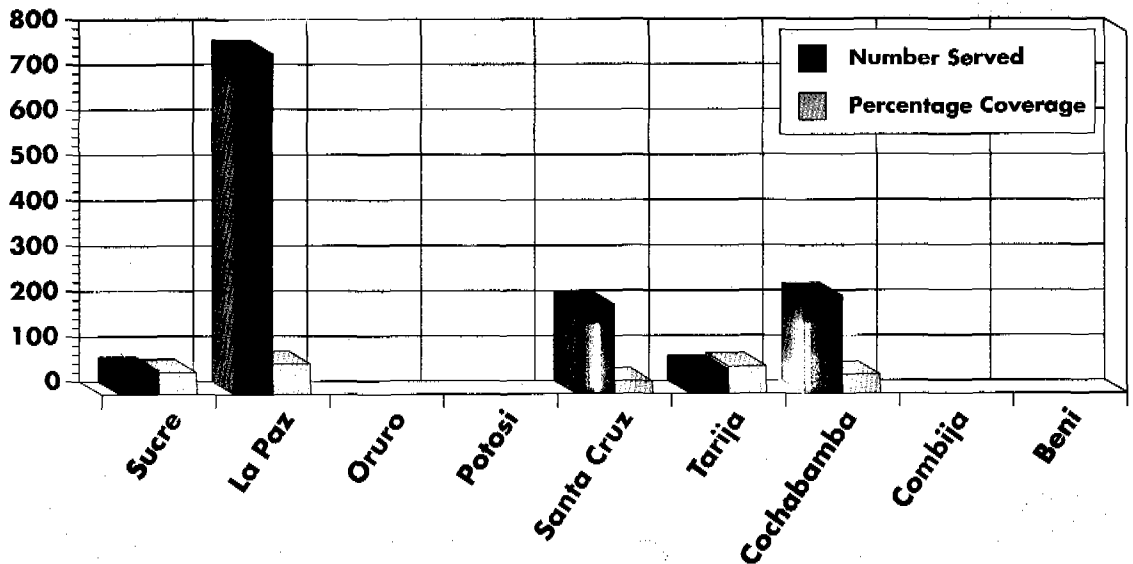
FIGURE 7B

Sanitation Service Coverage

Departmental Capitals of Bolivia

Source: JMP - 1991

Number Served (thousands)



populations. However, basic data have been generated for developing a strategy for reaching the unserved in the capital cities of the Departments.

Brazil: A Country-Size Pilot Project

Overview

The Brazilian Government, through the Secretary of Basic Sanitation of the Ministry of Social Action, with support from WHO/AMRO/PAHO and UNICEF, pre-tested WASAMS in the Northeastern State of Pernambuco, with a population of 7.1 million and a total surface area of 98,281 km².

The monitoring exercise, undertaken between September 1992 and June 1993 with UNICEF financial support and executed by the Pernambuco State Government through its "Fundação de Desenvolvimento Municipal do Interior de Pernambuco - FIAM", was targeted to the interior of Pernambuco State in 15 micro-regions comprising 164 municipalities. A State level meeting held in Recife in July 1993 led to a consensus on the need for a joint effort amongst all sector agencies to enhance sector monitoring so that more effective planning and decision making could be undertaken. The urgent need to rapidly make progress on this front is buttressed by the fact that a national household survey undertaken in 1989 revealed that only 62 per cent of the population of Pernambuco State had access to household water connections. Given the fact that this level of service is essentially restricted to "conventional" urban areas, the majority of the marginal urban and rural populations are currently deprived of access to safe water supply through household connections. Regarding access to adequate sanitation, the situation is much worse with only 15 per cent of the state's population having access to sewer connections.

Pre-testing of WASAMS

The exercise was planned in two phases:

- Baseline data collection and establishment of a sector data base.
- Implementation of an ongoing sector monitoring mechanism through the establishment of a sector monitoring unit on the basis of joint action and collaboration amongst sector agencies in the state.

It was quickly realized that the WASAMS questionnaire could not be completed with the data available in existing agency data bases. The questionnaire had therefore to be adapted so that it could better match the realities of Pernambuco State where it was to be applied. Amongst the difficulties observed were the absence of disaggregated data on different levels of services and application of the concept of high/low income populations. The absence of investment data was also noted.

To facilitate the use of WASAMS, *auxiliary survey instruments* were developed to collect existing data; enable data collection at household level; and to collect information not directly available.

The use of this methodology rendered the following advantages:

- Reduction of time spent in the field;
- Classification of all Municipalities;
- Collection of data on dispersed rural populations;
- Less difficulty in applying "WASAMS concepts";
- Collection of disaggregated data;
- Collection of official data through an additional questionnaire.

The difficulties which could not be overcome included the collection of investment data and some difficulties with the application of concepts.

Results obtained

- The WASAMS questionnaire was completed for 164 municipalities, and aggregated to both the micro-region and state levels.
- It was substantiated that the State water and sanitation company "Companhia Pernambucana de Saneamento — COMPESA" provides water supply services to most urban agglomerates with a minor participation of Municipal Administrations which, in turn, are essentially responsible for services in rural areas.
- Sanitation services are largely neglected with only a few urban centres being provided access to conventional sewers by COMPESA. Some Municipalities, how-

A State level meeting held in Recife in July 1993 led to a consensus on the need for a joint effort amongst all sector agencies to enhance sector monitoring so that more effective planning and decision making could be undertaken.

The WASAMS concept was found interesting in that it looks beyond the conventional technologies and attempts to focus on unserved low-income groups, such as marginal urban populations, and the standardization of information for all Municipalities.

ever, are embarking on small-bore sewer projects.

- Water supply services are frequently intermittent because of over-extension of existing systems, unaccounted for water losses, or limited water resource availability in the semi-arid interior of the State.
- In rural areas, access to simple water supply systems is facilitated by several State, Regional and Federal agencies.
- Latrines are the predominant means of excreta disposal in rural areas.
- Investment data could not be obtained with the exception of some isolated information derived from some Municipalities or COMPEA branches.

On the whole, the WASAMS concept was found interesting in that it looks beyond the conventional technologies and attempts to focus on unserved low-income groups, such as marginal urban populations, and the standardization of information for all Municipalities. Some of the perceived constraints include the lack of consideration for qualitative data, no information on water storage inside the households, no consideration for water sources or treatment, non inclusion of data on waste-water treatment, too large a number of levels of service, and the need to adapt the system to existing data bases.

Future perspective

In recognition of the fact that enhanced sector monitoring will allow sector agencies in Pernambuco State to operate more effectively and better coordinate their activities, several proposals emerged from the afore-mentioned pilot study:

- Adaptation of WASAMS computer programme to the realities of Pernambuco State;
- Amplification of WASAMS as a comprehensive water resources and environment management tool;
- Inclusion of data on operation and maintenance;
- Redefinition of financial variables including cost, investment and funding data;
- Establishment of a State Monitoring Unit (SMU) comprising all sector agencies operating in the state.

Cape Verde: Example of WASAMS Used By a Small Island State

Cape Verde is a nation comprising an archipelago with nine inhabited islands. The two largest islands, Santiago with a population of 175691 and Santo Antao with a population of 43845 are divided into *concelhos*, four in the case of Santiago and three in the case of Santo Antao. The other seven islands each comprise one *concelho*.

Cape Verde "pre-tested" WASAMS by applying the system to its 9 inhabited islands. The results are presented in Tables 8 and 9.

The authorities in Cape Verde have approached the application of monitoring by considering both the urban and rural sector for both water supply and sanitation. In addition, the two larger islands have established a network to collect information from the individual *concelho*.

Thus at the central level information for planning is available on an island by island basis, while in Santo Antao and Santiago the information by *concelho* is available for planning on an individual island basis. As an example, information on sanitation coverage for the island of Santiago is presented in Table 9.

At the present stage of sector monitoring development, Cape Verde has not disaggregated urban population into high-income and low-income groups. However, a start has been made to breaking down the population, both urban and rural, provided with water through different levels of service, i.e.: a piped supply into those with a house connection, a yard tap or supplied from a public standpost. (Table 10).

In common with many countries, Cape Verde has initiated its monitoring system by focussing on distribution of coverage and quality of services among the islands and among the *concelhos* within the Islands.

Some of the initial possible observations are:

- The highest level of urban service coverage (over 99 per cent) does not exist in the two most populous islands (Sao Vicente and Santiago) as may have been expected, but rather in Sal and Maio. This may be related to special circumstances in these islands.
- These two smaller islands also have relatively high levels of sanitation service coverage.
- The largest number of urban residents unserved with water, almost 24000, is to be

found on Santiago Island, where there is also the largest number unserved by appropriate sanitation, 84000.

- On Santiago most of the urban population unserved with water, i.e. 80 per cent, is in the concelho of Praia.
- The most important technology for urban piped water supply in Cape Verde is the public standpost, with 51 per cent of the 106679 inhabitants served through such a system. Only a little less than 10000 people have a yard tap supply.

Egypt: A Thorough Take-off in its Most Deprived Region

Background

In Egypt at least five organizations are responsible for the monitoring of the water supply and environmental sanitation sector. However, none of these have established a systematic nationwide monitoring system. Consequently, the JMP is being considered a suitable approach to initiate the process of enhancing sector monitoring.

Training has been sponsored for one of the engineers of the National Organization for Potable Water and Sanitary Drainage

In Egypt at least five organizations are responsible for the monitoring of the water supply and environmental sanitation sector. However, none of these have established a systematic nationwide monitoring system.

TABLE 8

Cape Verde - Water Supply Service Coverage in Nine Inhabited Islands

Island	Urban			Rural		
	Population Served (Number)	Population Unserved (Number)	Population Unserved (Per Cent)	Population Served (Number)	Population Unserved (Number)	Population Unserved (Per Cent)
Santo Antao	9982	101	1.0	17489	16273	48.2
Sao Vicente	35143	11966	25.4	1709	2459	59.0
Sao Nicolau	1738	161	8.6	7236	4530	38.5
Sal	6893	28	0.4	730	64	8.1
Boavista	1490	32	2.1	975	955	49.5
Maio	1567	6	0.4	3325	71	2.1
Santiago	50163	23823	22.2	17697	84008	82.6
Fogo	4341	1275	22.7	11371	16915	59.8
Brava	1448	442	23.4	3793	1292	25.4
Total	112765	37834	25.1	64325	126567	66.3

TABLE 9

Santiago Island - Sanitation Service Coverage by Concelho

Concelho	Urban			Rural		
	Population Served (Number)	Population Unserved (Number)	Population Unserved (Per Cent)	Population Served (Number)	Population Unserved (Number)	Population Unserved (Per Cent)
Santo Antao	9982	101	1.0	17489	16273	48.2
Tarrafal	917	2709	74.7	1460	20327	93.3
Sta. Catarina	1871	1543	45.2	2825	35345	92.6
Sta. Cruz	631	4671	88.1	597	19993	97.1
Praia	25274	36370	59.0	952	20206	95.5
Total	28693	45293	61.2	5834	95871	94.3

A national conference on sector monitoring will include presentation of case studies, discussions on enhancement of sector monitoring and the application of the JMP approach in Upper Egypt.

(NOPWASD). However, the lack of hardware and the need to strengthen advocacy have slowed down implementation.

Current Efforts

The UNICEF Cairo Office has started an advocacy campaign for introducing the JMP approach in Egypt both nationally and sub-nationally (for governorates, districts and villages).

The following steps have been taken, are in the process of being finalized, or have been planned:

- WASAMS forms have been translated into Arabic and disseminated to two governorates for testing. The data for one governorate, Assiut, are now complete to the village level and a report is being finalized.
- The forms were filled on the national level by NOPWASD.
- The WASAMS software is currently being converted into an Arabic version by local programmers (input/output windows in Arabic/English).
- An inventory of available computer hardware in the four governorates of Upper Egypt is being carried out and UNICEF is considering the provision of, or augmenting, the available hardware.
- Training sessions are being undertaken for operators and policy makers to advocate the use and benefits of the system.

- Data will be collected at the village level and aggregated upwards in Upper Egypt and a report will be finalized by October 1993.
- A national conference on sector monitoring is planned for November 1993. It will include presentation of case studies, discussions on enhancement of sector monitoring and the application of the JMP approach in Upper Egypt. Sector officials of all 26 governorates, as well as central government authorities will be invited.
- Implementation/replication of a pilot effort in 26 governorates with periodic reporting starting in 1994.

Comments on WASAMS

The following observations on the WASAMS computer programme and its application to Egypt have been received:

- Hygiene education and hygiene awareness are not present.
- Definition of the level of service varies from governorate to governorate.
- Categorization of urban population into high and low income is not easy or well understood.
- More information and experiences are required to effectively advocate the use of JMP and WASAMS as sector monitoring tools and linkage to planning and investment decision making.

TABLE 10

Cape Verde: Breakdown of Urban Piped Water Supply Into Different Levels of Service per Island

Concelho	Number Served		
	House Connection No.	Yard Tap No.	Public Standpost No.
Santo Antao	480	1202	2344
Sao Vicente	19431	1692	13970
Sao Nicolao	1250	4	484
Sal	2912	428	3559
Boavista	137	5	1349
Maio	188	23	1357
Santiago	16718	6541	26949
Fogo	1430	20	2892
Brava	169	53	1092
Total	42715	9968	53996

Togo: Making Progress Despite Socio-political Unrest

Decade results

Unfortunately, despite the planning and commitment to the goals of the Decade, Togo, in common with most developing countries, did not succeed in reaching these. In fact, at the end of the Decade, the situation was as follows:

- 90 per cent of the rural population was without appropriate sanitation.
- 47 per cent of the rural population was without an adequate and safe water supply;
- 44 per cent of the urban population was without appropriate sanitation;
- 23 per cent of the urban population was without an adequate and safe water supply;

In 1990 there was a total of 1,400,000 people without adequate and safe water, and 2,700,000 without access to appropriate means of excreta disposal. By the year 2000, the population of Togo is expected to increase by 1,400,000. This means that to reach universal coverage by the turn of the century, 2,800,000 more people will have to be provided with water and 4,100,000 with sanitation.

The role of monitoring in sector planning

To cope with the unserved populations, the Government of Togo has initiated a major water supply and sanitation sector planning exercise, the foundation of which is an improved monitoring system. The need to upgrade sector monitoring was identified as fundamental during the implementation of the Decade programme in Togo.

The monitoring system in Togo utilizes the methodology of the Joint Water Supply and Sanitation Monitoring Programme (JMP). A network of regional monitoring focal points has been established and data collection is now undertaken annually. Information for 1990, 1991, and 1992 is available.

Available data comprise demographic information, service coverage, the financing of operation and maintenance, and capital investment. These are the JMP "core indicators". In addition, information on coverage is collected on the basis of the type of technology used to provide services. Togo is one of the few countries which has been able to achieve a high de-

gree of reporting on sector funding and management. To date, however, it has not been possible to differentiate between urban high-income and urban low-income populations.

How Togo went about enhancing sector monitoring

Togo has been associated with the development of the Joint Monitoring Programme (JMP) from its very early stage. Indeed, a joint team made up of representatives from the government, WHO and UNICEF attended the Pre-Test Workshop held at WHO Headquarters in Geneva in April 1991. Several follow-up actions were taken for further development of the monitoring programme.

Sensitization of government officials:

The following activities have been formulated to sensitize sector government officials and persuade them to enhance sector monitoring at country level:

- Meetings with directors of sector-related government offices (rural and urban water resources, sanitation, etc.) to submit the report prepared on the situation and introduce the proposed monitoring programme.
- Advocacy visits by UNICEF's representative to the heads of the concerned Ministries.
- The Programme was presented during the national workshop organized to formulate the Sector's National Plan of Action for the 1990s.

These actions led to a Ministerial Decree, in early 1992, establishing the Water and Sanitation National Monitoring Unit.

Establishment of a National Monitoring Unit (NMU):

The NMU consists of three members, one from each of the following agencies:

- The Office for Water Resources and Energy (which is in charge of rural water resources);
- The National Water Administration (in charge of water supply to urban areas); and
- The National Sanitation Service (responsible for urban and rural sanitation).

Togo is one of the few countries which has been able to achieve a high degree of reporting on sector funding and management.

The main constraint to the enhancement of sector monitoring in Togo has been the recent socio-political unrest.

The task of outlining an initial work plan was undertaken, aimed at developing strategies for sector monitoring implementation and a sensitization campaign aimed at donors, NGOs and other sector-related entities, and establishment of a monitoring network.

This network will initially be constituted by Monitoring Committees, one for each of the country's five administrative regions. Unfortunately, the prevalent socio-political crisis in Togo has hampered the adequate operation of the NMU and the activities outlined in the workplan have not been carried out as planned.

Data collection – WASAMS questionnaire:

The first attempt to complete a WASAMS questionnaire was undertaken during the Pre-Test Workshop at WHO/HQ Geneva in April 1991. At that time, the exercise identified the weaknesses of sector monitoring. Often, no data were available, and when these existed they were scattered among different offices and departments and were frequently not reliable.

Based on the experience with collecting data for 1990, very simple cards were developed by the NMU to facilitate the data collection process at regional level. Data from the cards were later used by the NMU to complete the questionnaire.

In October 1991 it was decided to broaden the work at regional level by integrating the regional agencies for water supply with those

of sanitation. This has allowed access to a larger array of data and has led to greater accuracy.

Meetings organized with officials at the regional level provided the means to inform others of progress made in sector monitoring, to mobilize programme support, and to initiate establishment of a national network. In the course of these meetings the issue of the terms of reference for the regional monitoring committees was a major consideration.

Problems and constraints:

The main constraint to the enhancement of sector monitoring in Togo has been the recent socio-political unrest.

Future perspectives:

After some delay, a meeting organized in June 1993 to collect data for 1991 led to a revival of the monitoring programme. The following activities were agreed upon on that occasion:

- Dissemination of 1990 and 1991 data to all sector-related governmental and non-governmental parties,
- Collection of sector data for 1992,
- Design and implementation of an action plan which will include the establishment of the regional monitoring committees and organization of a training workshop on programming. 🌐

V. Main lessons learned by JMP Country Implementation

Judging from the examples of country applications presented in Section IV and from recent field level experiences of the current WHO and UNICEF JMP team, it is obvious that each country has its own *modus operandi*, and that the parameters governments are interested in monitoring at sub-national level vary. Some of the aspects emerging from recent experience are:

■ Monitoring of "strategic parameters" such as sector coverage and funding, which are both incorporated in the water and sanitation monitoring system (WASAMS), tends to be confused or mixed up with "operational parameters" such as information on project implementation, water quality, system losses or level of tariff recovery, which are all very relevant to improving efficiency of the supply side of the sector — the service providers. At this stage, WASAMS is only addressing indicators for improved sector planning and resource allocations, although the system could be expanded to include information for operational purposes; this is currently under consideration.

■ Although the "open-ended" capability of the WASAMS computer programme has made it adaptable to respond to individual national requirements, the need has been identified to introduce further flexibility into the system. There was interest from countries in both expanding and/or shrinking the current WASAMS computer programme.

■ Recent experiences at country level have highlighted difficulties in data collection, lack

of standardisation of data formatting at sub-national level to facilitate comparisons, inadequate data on sector funding, and difficulties in disaggregating urban populations into low-income and high-income categories.

■ Government and external support agency officials are beginning to realize the importance of improved sector information for advocacy, fund generation and routine planning/management, and are therefore increasingly prepared to invest in enhanced monitoring in anticipation of the results that such initiatives may generate.

■ In recognition of the value of monitoring, countries have established national or sub-national monitoring units.

■ Inter-agency sector monitoring has proved instrumental in improving coordination of an operationally vertical sector, leading to increased efficiency.

■ The thrust for improving sector monitoring is capacity building through the development of decentralized data collection, with computer programmes being one of several key elements.

■ The challenge of supporting capacity building and institutional development for the enhancement of sector monitoring is far beyond the resources of WHO and UNICEF. It is therefore necessary for other external development partners to also build support to national sector monitoring into their programmes. This will facilitate the pooling of resources, as well as improve coordination of efforts amongst external support agencies. ☉

At this stage, WASAMS is only addressing indicators for improved sector planning and resource allocations, although the system could be expanded to include information for operational purposes, this is currently under consideration.

Annex I

Index of Maps

Map I-1

Urban Water Supply

Coverage as a Percentage of Population Served

Map I-2

Rural Water Supply

Coverage as a Percentage of Population Served

Map I-3

Urban Sanitation

Coverage as a Percentage of Population Served

Map I-4

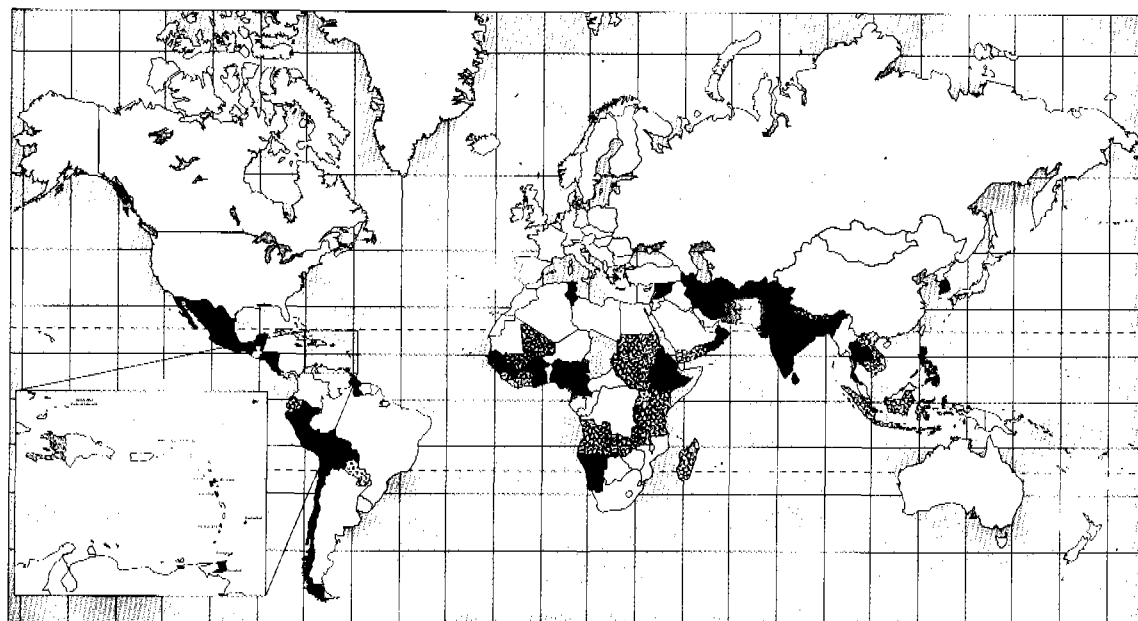
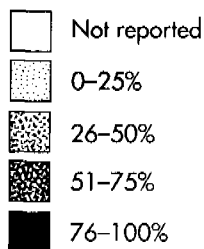
Rural Sanitation

Coverage as a Percentage of Population Served

MAP I-1
Urban Water Supply

Coverage as a Percentage of population served.

Source: JMP - 1991

Legend


Urban Water Supply
Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	—	—	71.29	—
Burundi	5356.26	—	—	—	98.70
Burkina Faso	—	—	—	—	77.57
Cameroon	16186.19	—	—	—	100.00
Chad	5550.00	24.93	—	—	—
Comoros	468.46	—	—	—	98.00
Cote D'Ivoire	10735.98	—	—	69.95	—
Djibouti	480.00	—	—	—	88.00
Egypt	56000.00	—	—	—	—
Equat. Guinea	356.10	—	—	70.01	—
Ethiopia	48728.93	—	—	—	90.59
Ghana	15000.00	—	—	—	93.20
Guinea	5604.00	—	—	—	86.67
Guinea Bissau	984.00	—	—	56.38	—
Kenya	24398.00	—	—	73.70	—
Liberia	—	—	34.62	—	—
Madagascar	11200.00	—	—	54.85	—
Mali	8100.00	—	—	53.00	—
Namibia	—	—	—	—	98.00
Nigeria	88500.00	—	—	—	81.10
Rep Of Tanzania	25157.00	—	—	64.99	—
Rwanda	7412.15	—	—	75.14	—
Senegal	6928.41	—	—	—	83.85
Sierra Leone	3664.00	—	33.20	—	—
Somalia	—	7.14	—	—	—
Sudan	24600.00	—	—	55.19	—
Togo	3495.60	—	—	—	76.85
Tunisia	8220.00	—	—	—	100.00
Uganda	16794.00	—	43.02	—	—
Zambia	8000.00	—	—	70.00	—
Total	414679.1				

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Belize	184.00	—	—	—	—
Bolivia	6928.00	—	—	—	77.36
Bri. Vir. Isl.	16.64	—	—	—	100.00
Belize					95.40
Chile					100.00
Costa Rica	2940.69	—	—	—	100.00
Dominica	80.00	—	—	—	96.88
Ecuador	10782.00	—	—	63.30	—
El Salvador	5250.00	—	—	—	84.96
Guyana	755.00	—	—	—	90.00
Haiti	6065.74	—	—	55.39	—
Honduras	5121.83	—	—	—	98.30
Jamaica	2400.00	—	—	—	100.00
Mexico	81100.00	—	—	—	80.82
Montserrat	22.10	—	—	—	100.00
Nicaragua	3807.00	—	—	—	78.00
Peru					76.50
Paraguay	4280.00	—	49.89	—	—
St. Kitts	34.00	—	—	—	99.75
St. Vincent	107.60	—	—	—	100.00
Trinidad & Tobago	1234.00	—	—	—	99.00
Total	131365.6				

Asia & The Pacific

Afghanistan	17700.00	—	—	—	79.31
Bangladesh	110939.00	—	—	—	82.17
Bhutan	1200.00	—	—	60.00	—
Cambodia	8134.00	—	—	65.28	—
China	1143330.00	—	—	—	—
Cook Islands	19.00	—	—	—	100.00
India	853380.00	—	—	—	86.80
Indonesia	180000.00	—	—	67.68	—
Iran	56799.00	—	—	—	98.00
Lao	4389.00	—	—	54.34	—
Maldives	215.00	—	—	—	100.00
Myanmar	41552.00	—	36.62	—	—
Nepal	18863.00	—	—	66.61	—
Pakistan	116000.00	—	—	—	80.22
Philippines	61136.00	—	—	—	85.35
Rep Of Korea	43410.00	—	—	—	97.28
Sri Lanka	17617.00	—	—	—	100.00
Thailand	55538.00	—	—	—	88.62
Vietnam	67400.00	—	38.52	—	—
Total	2797620				

Western Asia

Oman	1209.00	—	—	—	91.46
Syria	12529.00	—	—	—	90.00
Yemen	10620.00	—	—	61.31	—
Total	24358				






MAP 1-2

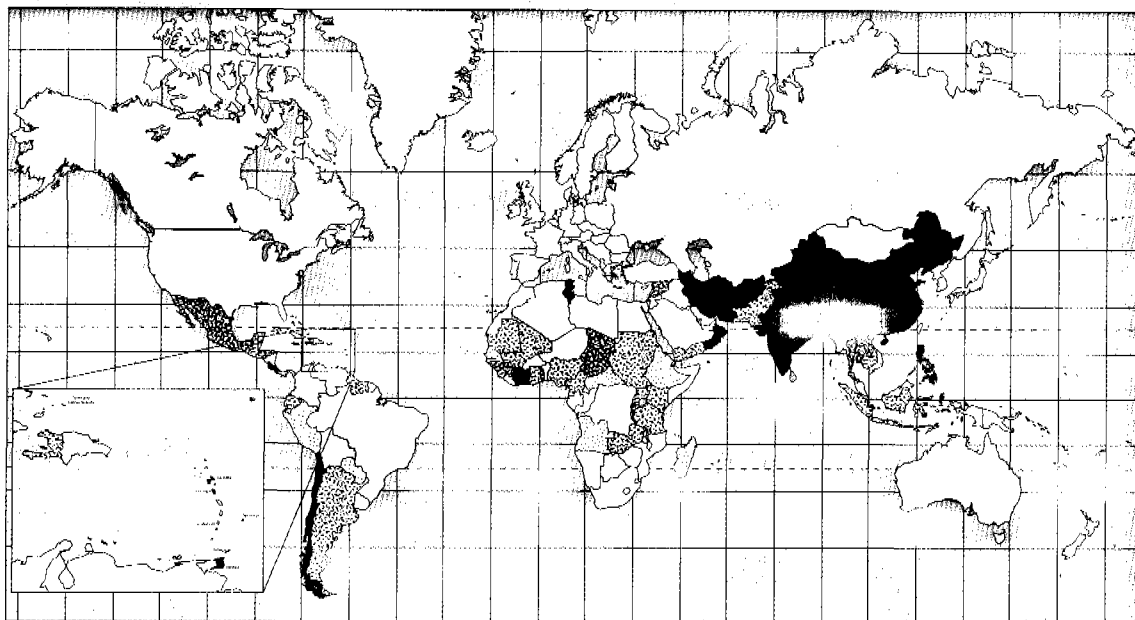
Rural Water Supply

Coverage as a percentage of population served.

Source: JMP - 1991

Legend

-  Not reported
-  0-25%
-  26-50%
-  51-75%
-  76-100%



Rural Water Supply
Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	—	—	71.29	—
Burundi	5356.26	—	—	—	98.70
Burkina Faso	—	—	—	—	77.57
Cameroon	16186.19	—	—	—	100.00
Chad	5550.00	24.93	—	—	—
Comoros	468.46	—	—	—	98.00
Cote D'Ivoire	10735.98	—	—	69.95	—
Djibouti	480.00	—	—	—	88.00
Egypt	56000.00	—	—	—	—
Equat. Guinea	356.10	—	—	70.01	—
Ethiopia	48728.93	—	—	—	90.59
Ghana	15000.00	—	—	—	93.20
Guinea	5604.00	—	—	—	86.67
Guinea Bissau	984.00	—	—	56.38	—
Kenya	24398.00	—	—	73.70	—
Liberia	—	—	34.62	—	—
Madagascar	11200.00	—	—	54.85	—
Mali	8100.00	—	—	53.00	—
Namibia	—	—	—	—	98.00
Nigeria	88500.00	—	—	—	81.10
Rep Of Tanzania	25157.00	—	—	64.99	—
Rwanda	7412.15	—	—	75.14	—
Senegal	6928.41	—	—	—	83.85
Sierra Leone	3664.00	—	33.20	—	—
Somalia	—	7.14	—	—	—
Sudan	24600.00	—	—	55.19	—
Togo	3495.60	—	—	—	76.85
Tunisia	8220.00	—	—	—	100.00
Uganda	16794.00	—	43.02	—	—
Zambia	8000.00	—	—	70.00	—
Total	414679.1				

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Belize	184.00	—	—	—	—
Bolivia	6928.00	—	—	—	77.36
Bri. Vir. Isl.	16.64	—	—	—	100.00
Belize					95.40
Chile					100.00
Costa Rica	2940.69	—	—	—	100.00
Dominica	80.00	—	—	—	96.88
Ecuador	10782.00	—	—	63.30	—
El Salvador	5250.00	—	—	—	84.96
Guyana	755.00	—	—	—	90.00
Haiti	6065.74	—	—	55.39	—
Honduras	5121.83	—	—	—	98.30
Jamaica	2400.00	—	—	—	100.00
Mexico	81100.00	—	—	—	80.82
Montserrat	22.10	—	—	—	100.00
Nicaragua	3807.00	—	—	—	78.00
Peru					76.50
Paraguay	4280.00	—	49.89	—	—
St. Kitts	34.00	—	—	—	99.75
St. Vincent	107.60	—	—	—	100.00
Trinidad & Tobago	1234.00	—	—	—	99.00
Total	131365.6				

Asia & The Pacific

Afghanistan	17700.00	—	—	—	79.31
Bangladesh	110939.00	—	—	—	82.17
Bhutan	1200.00	—	—	60.00	—
Cambodia	8134.00	—	—	65.28	—
China	1143330.00	—	—	—	—
Cook Islands	19.00	—	—	—	100.00
India	853380.00	—	—	—	86.80
Indonesia	180000.00	—	—	67.68	—
Iran	56799.00	—	—	—	98.00
Lao	4389.00	—	—	54.34	—
Maldives	215.00	—	—	—	100.00
Myanmar	41552.00	—	36.62	—	—
Nepal	18863.00	—	—	66.61	—
Pakistan	116000.00	—	—	—	80.22
Philippines	61136.00	—	—	—	85.35
Rep Of Korea	43410.00	—	—	—	97.28
Sri Lanka	17617.00	—	—	—	100.00
Thailand	55538.00	—	—	—	88.62
Vietnam	67400.00	—	38.52	—	—
Total	2797620				

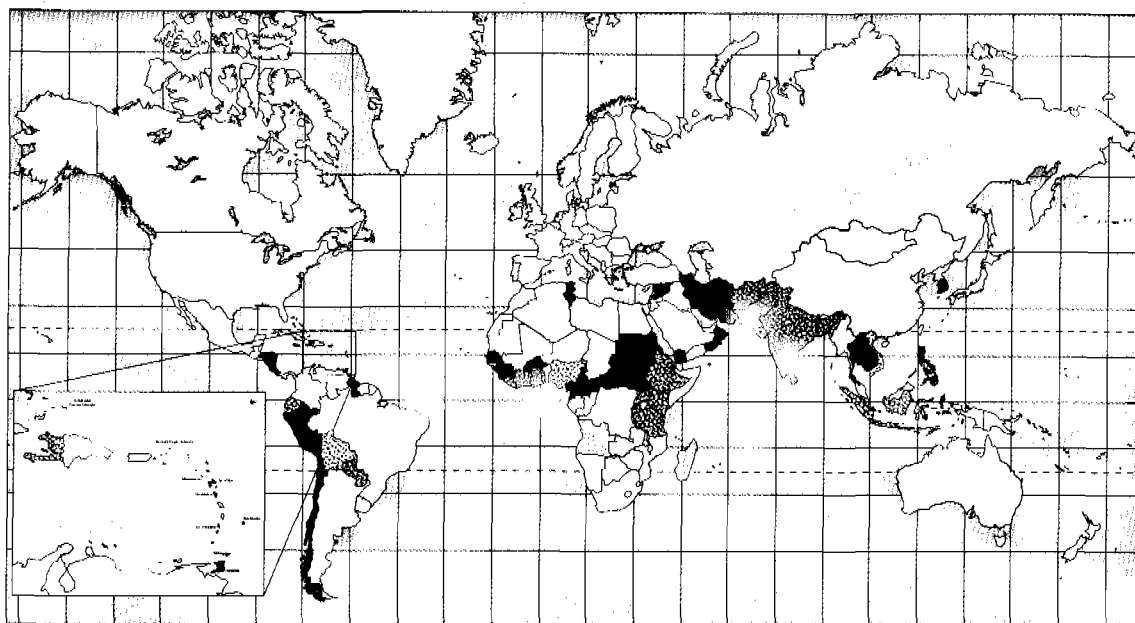
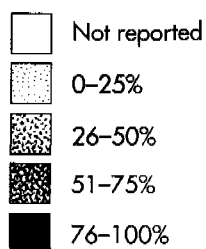
Western Asia

Oman	1209.00	—	—	—	91.46
Syria	12529.00	—	—	—	90.00
Yemen	10620.00	—	—	61.31	—
Total	24358				

MAP 1-3
Urban Sanitation

Coverage as a percentage of population served.

Source: JMP - 1991

Legend

Urban Sanitation

Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	25.01			
Burundi	5356.26	—	—	71.00	
Burkina Faso					76.55
Cameroon	16186.19	—		—	100.00
Chad	5550.00		—		—
Comoros	468.46	—	—		90.48
Cote D'Ivoire	10735.98	—	—	58.90	
Djibouti	480.00	—	—	64.00	
Egypt	56000.00	—	—		—
Equat. Guinea	356.10				95.00
Ethiopia	48728.93			75.60	
Ghana	15000.00	—		64.38	—
Guinea	5604.00	—	—		84.02
Guinea Bissau	984.00	—	27.48		—
Kenya	24398.00	—		69.23	—
Liberia				55.05	
Madagascar	11200.00	11.95	—		—
Mali	8100.00	—			—
Mauritania					
Nigeria	88500.00	—	40.00	—	
Rep Of Tanzania	25157.00	—		73.99	—
Rwanda	7412.15	—	—		77.00
Senegal	6928.41			—	85.09
Sierra Leone	3664.00	—		—	91.87
Sudan	24600.00	—			88.77
Togo	3495.60	—	—	55.62	—
Tunisia	8220.00	—	—	—	97.56
Uganda	16794.00			62.72	—
Zambia	8000.00	—		75.44	—
Total	414679.1				

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	—
Belize	184.00	—	—	—	—
Bolivia	6928.00	—	40.16	—	—
Bri. Vir. Isl.	16.64	—	—	—	100.00
Chile	—	—	—	—	100.00
Costa Rica	2940.69	—	—	—	100.00
Dominica	80.00	—	—	—	100.00
Ecuador	10782.00	—	—	56.36	—
El Salvador	5250.00	—	—	—	85.84
Guatemala	—	—	—	—	—
Guyana	755.00	—	—	—	90.00
Haiti	6065.74	—	—	55.39	—
Honduras	5121.83	—	—	—	98.30
Jamaica	2400.00	—	—	—	100.00
Mexico	81100.00	—	—	69.67	—
Montserrat	22.10	—	—	—	100.00
Nicaragua	3807.00	—	—	—	78.01
Paraguay	4280.00	—	—	55.80	—
Peru	—	—	—	—	76.5
St. Kitts	34.00	—	—	—	97.56
Suriname	—	—	—	—	—
St. Vincent	107.60	—	—	—	100.00
Trinidad & Tobago	1234.00	—	—	—	99.00
Total	131365.6				

Asia & The Pacific

Afghanistan	17700.00	—	—	71.43	—
Bangladesh	110939.00	—	—	63.45	—
Bhutan	1200.00	—	50.00	—	—
Cambodia	8134.00	—	—	—	80.59
China	1143330.00	—	—	—	—
Cook Islands	19.00	—	—	—	100.00
India	853380.00	—	—	52.68	—
Indonesia	180000.00	—	—	63.75	—
Iran	56799.00	—	—	—	85.74
Lao	4389.00	—	—	—	97.30
Maldives	215.00	—	—	—	100.00
Myanmar	41552.00	—	39.02	—	—
Nepal	18863.00	—	—	51.55	—
Pakistan	116000.00	—	—	55.14	—
Philippines	61136.00	—	—	—	78.47
Rep Of Korea	43410.00	—	—	—	100.00
Sri Lanka	17617.00	—	—	72.91	—
Thailand	55538.00	—	—	—	79.54
Vietnam	67400.00	—	34.07	—	—
Total	2797620				

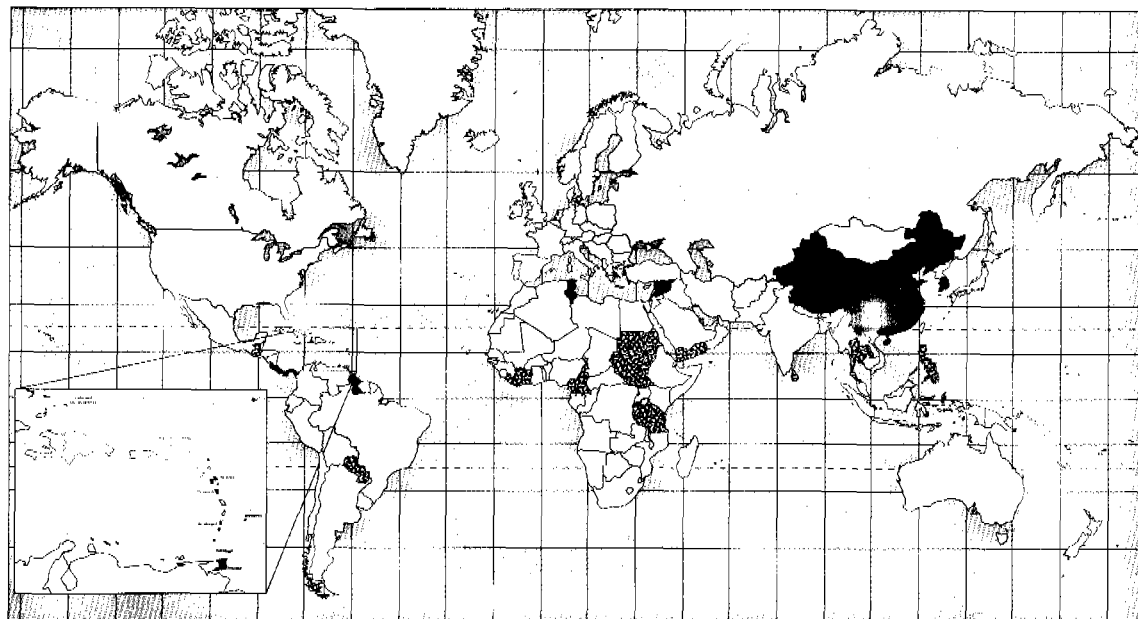
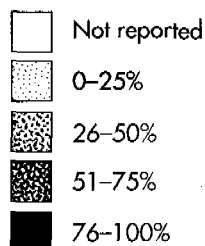
Western Asia

Oman	1209.00	—	0.00	—	74.91
Syria	12529.00	—	—	—	83.99
Yemen	10620.00	—	—	—	87.42
Total	24358				

MAP 1-4
Rural Sanitation

Coverage as a percentage of population served.

Source: JMP - 1991

Legend

Rural Sanitation

Coverage as a Percentage of Population Served

Africa

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	15.00			
Burundi	5356.26	—	47.00		
Cameroon	16186.19	—		63.63	
Chad	5550.00		—		—
Comoros	468.46	—	—		80.00
Cote D'Ivoire	10735.98	—	—	61.85	
Djibouti	480.00	23.81	—		
Egypt	56000.00	—	—		—
Equat. Guinea	356.10	10.00			
Ethiopia	48728.93	7.00			
Ghana	15000.00	—	32.11		—
Guinea	5604.00	4.58	—		
Guinea Bissau	984.00	—	32.11		—
Kenya	24398.00	—	34.78		—
Liberia				55.05	
Madagascar	11200.00	3.00	—		—
Mali	8100.00	—			—
Mauritania		13.10			
Nigeria	88500.00	—	30.00	—	
Rep Of Tanzania	25157.00	—		62.00	—
Rwanda	7412.15	—	—	56.43	
Senegal	6928.41		35.70	—	
Sierra Leone	3664.00	—	49.10	—	
Sudan	24600.00	—		65.00	
Togo	3495.60	9.88	—		—
Tunisia	8220.00	—	—	—	94.08
Uganda	16794.00		28.00		—
Zambia	8000.00	11.50			—
Total	414679.1				

Latin America & The Caribbean

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Belize	184.00	—	—	—	—
Bolivia	6928.00	12.73	—	—	—
Bri. Vir. Isl.	16.64	—	—	—	100.00
Chile	—	20.00	—	—	—
Costa Rica	2940.69	—	—	—	94.30
Dominica	80.00	—	—	—	98.02
Ecuador	10782.00	—	38.45	—	—
El Salvador	5250.00	—	36.12	—	—
Guatemala	—	—	—	52.30	—
Guyana	755.00	—	—	—	89.47
Haiti	6065.74	16.00	—	—	—
Honduras	5121.83	—	43.10	—	—
Jamaica	2400.00	—	—	—	80.27
Mexico	81100.00	17.00	—	—	—
Montserrat	22.10	—	—	—	—
Nicaragua	3807.00	—	—	—	—
Panama	—	—	—	—	84.26
Paraguay	4280.00	—	—	66.60	—
Peru	—	20.09	—	—	—
St. Kitts	34.00	—	—	—	99.89
Suriname	—	—	—	—	—
St. Vincent	107.60	—	—	—	100.00
Suriname	—	—	43.00	—	—
Trinidad & Tobago	1234.00	—	—	—	98.39
Turks & Caicos	—	—	—	—	88.00
Total	131365.6	—	—	—	—

Asia & The Pacific

Afghanistan	17700.00	—	—	—	—
Bangladesh	110939.00	25.70	—	—	—
Bhutan	1200.00	7.00	—	—	—
Cambodia	8134.00	7.87	—	—	—
China	1143330.00	—	—	—	95.01
Cook Islands	19.00	—	—	—	100.00
India	853380.00	2.01	—	—	—
Indonesia	180000.00	—	35.65	—	—
Iran	56799.00	—	—	—	—
Lao	4389.00	7.50	—	—	—
Maldives	215.00	—	—	—	—
Myanmar	41552.00	—	34.71	—	—
Nepal	18863.00	3.00	—	—	—
Pakistan	116000.00	10.00	—	—	—
Philippines	61136.00	—	—	62.09	—
Rep Of Korea	43410.00	—	—	—	100.00
Sri Lanka	17617.00	—	—	56.00	—
Thailand	55538.00	—	—	71.53	—
Vietnam	67400.00	13.17	—	—	—
Total	2797620	—	—	—	—

Western Asia

Jordan	—	—	32.09	—	—
Oman	1209.00	—	40.00	—	—
Syria	12529.00	—	—	—	82.01
Yemen	10620.00	—	—	59.91	—
Total	24358	—	—	—	—

Annex II

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Latin America & the Caribbean

Total Sanitation. Urban & Rural Combined

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Asia & the Pacific

Total Water Supply. Urban & Rural Combined

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Asia & the Pacific

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Western Asia

Total Water Supply. Urban & Rural Combined

Table II-8:

Western Asia

Total Sanitation. Urban & Rural Combined

TABLE II-1

Africa: Total Water Supply
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	—	40.67	—	—
Burundi	5356.26	—	—	56.74	—
Cameroon	16186.19	—	47.90	—	—
Chad	5550.00	—	—	57.37	—
Comoros	468.46	—	—	69.47	—
Cote D'Ivoire	10735.98	—	—	—	75.55
Djibouti	480.00	—	—	—	84.17
Egypt	56000.00	—	—	68.70	—
Equatorial Guinea	356.10	—	34.73	—	—
Ethiopia	48728.93	—	25.35	—	—
Ghana	15000.00	—	—	52.43	—
Guinea	5604.00	—	—	52.85	—
Guinea Bissau	984.00	—	41.48	—	—
Kenya	24398.00	—	48.61	—	—
Madagascar	11200.00	22.90	—	—	—
Mali	8100.00	—	41.31	—	—
Nigeria	88500.00	—	35.83	—	—
Rep Of Tanzania	25157.00	—	48.69	—	—
Rwanda	7412.15	—	—	66.01	—
Senegal	6928.41	—	48.33	—	—
Sierra Leone	3664.00	—	36.50	—	—
Sudan	24600.00	—	47.63	—	—
Togo	3495.60	—	—	59.64	—
Tunisia	8220.00	—	—	—	99.46
Uganda	16794.00	21.10	—	—	—
Zambia	8000.00	—	—	52.98	—
Total	414679.08	2	12	8	3

TABLE II-2

Africa: Total Sanitation
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Angola	12760.00	18.90	—	—	—
Burundi	5356.26	—	48.72	—	—
Cameroon	16186.19	—	—	73.62	—
Comoros	468.46	—	—	52.74	—
Cote D'Ivoire	10735.98	—	—	60.41	—
Djibouti	480.00	—	—	55.21	—
Egypt	56000.00	—	31.17	—	—
Equatorial Guinea	356.10	—	41.47	—	—
Ethiopia	48728.93	—	—	—	75.60
Ghana	15000.00	—	41.79	—	—
Guinea	5604.00	20.95	—	—	—
Guinea Bissau	984.00	—	30.68	—	—
Madagascar	11200.00	3.00	—	—	—
Nigeria	8850.00	—	35.00	—	—
Rep Of Tanzania	25157.00	—	—	64.21	—
Rwanda	7412.15	—	—	57.54	—
Senegal	6928.41	—	—	54.96	—
Sierra Leone	1107.94	—	—	57.65	—
Sudan	24600.00	—	—	74.82	—
Togo	3495.60	23.15	—	—	—
Tunisia	8220.00	—	—	—	96.16
Uganda	16793.00	—	31.90	—	—
Zambia	8000.00	—	37.02	—	—
Total	294424.02	4	7	9	2

TABLE II-3

Western Asia: Total Water Supply
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Oman	1209.00	—	—	—	84.04
Syria	12529.00	—	—	74.12	—
Yemen	10620.00	—	36.02	—	—
Total	24358	0	1	1	1

TABLE II-4

Western Asia: Total Sanitation
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Oman	1209.00	—	—	70.84	—
Syria	12529.00	—	—	—	83.02
Yemen	10620.00	—	—	65.24	—
Total	24358	0	0	2	1

TABLE II-5

Latin America & Caribbean: Total Water Supply
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Belize	184.00	—	—	—	90.20
Bolivia	6928.00	—	—	52.09	—
Bri. Vir. Isl.	16.64	—	—	—	100.00
Costa Rica	2940.69	—	—	—	93.24
Dominica	80.00	—	—	—	95.75
Ecuador	10782.00	—	—	54.54	—
El Salvador	5250.00	—	47.43	—	—
Guyana	755.00	—	—	65.17	—
Haiti	6065.74	—	39.35	—	—
Honduras	5121.83	—	—	—	76.97
Jamaica	2400.00	—	—	—	100.00
Mexico	81100.00	—	—	—	76.08
Montserrat	22.10	—	44.53	—	—
Nicaragua	3807.00	—	—	53.20	—
Paraguay	4280.00	—	34.88	—	—
St. Kitts	34.00	—	—	—	99.88
St. Vincent	107.60	—	—	—	88.91
Trinidad & Tobago	1234.00	—	—	—	97.22
Total	131365.6	0	4	4	11

TABLE II-6

Latin America & Caribbean: Total Sanitation
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Barbados	257.00	—	—	—	100.00
Bolivia	6928.00	—	26.47	—	—
Bri. Vir. Isl.	16.64	—	—	—	100.00
Costa Rica	2940.69	—	—	—	97.34
Dominica	80.00	—	—	—	98.81
Ecuador	10782.00	—	48.38	—	—
El Salvador	5250.00	—	—	57.52	—
Guyana	755.00	—	—	—	93.38
Haiti	6065.74	23.65	—	—	—
Honduras	5121.83	—	—	60.79	—
Jamaica	2400.00	—	—	—	89.38
Mexico	81100.00	—	—	50.18	—
Montserrat	22.10	—	—	—	83.64
Panama	2300.00	—	—	—	84.30
Paraguay	4280.00	—	—	62.03	—
Peru	22796.00	—	—	57.47	—
St. Kitts	34.00	—	—	—	99.88
St. Vincent	107.60	—	—	—	97.68
Trinidad & Tobago	1234.00	—	—	—	79.07
Total	152470.60	1	2	5	11

TABLE 11-7

Asia & the Pacific: Total Water Supply
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Afghanistan	1770.00	—	—	—	99.20
Bangladesh	110939.00	—	—	—	84.21
Bhutan	1200.00	—	34.20	—	—
Cambodia	8134.00	—	36.26	—	—
China	1143330.00	—	—	—	79.10
Cook Islands	19.00	—	—	—	100.00
India	853380.00	—	—	—	85.16
Indonesia	180000.00	—	—	50.89	—
Iran	56799.00	—	—	—	90.00
Lao	4389.00	—	36.17	—	—
Maldives	215.00	—	—	68.91	—
Myanmar	41552.00	—	31.91	—	—
Nepal	18863.00	—	41.94	—	—
Pakistan	116000.00	—	—	56.12	—
Philippines	61136.00	—	—	—	81.85
Rep Of Korea	43410.00	—	—	—	96.97
Sri Lanka	17617.00	—	—	71.21	—
Thailand	55538.00	—	—	—	77.25
Vietnam	67400.00	24.48	—	—	—
Total	2797620	1	5	4	8

TABLE 11-8

Asia & the Pacific: Total Sanitation
Coverage as a percentage of population served

Country	Population (in thousands)	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Afghanistan	17600.00	—	—	71.43	—
Bangladesh	108799.00	—	31.44	—	—
Bhutan	1200.00	13.02	—	—	—
Cambodia	8134.00	14.43	—	—	—
Cook Islands	19.00	—	—	—	100.00
India	853380.00	16.20	—	—	—
Indonesia	180000.00	—	44.39	—	—
Iran	56799.00	—	—	—	85.74
Lao	4389.00	20.94	—	—	—
Maldives	221.00	—	49.40	—	—
Myanmar	40100.00	—	35.77	—	—
Nepal	18863.00	5.90	—	—	—
Pakistan	116000.00	24.40	—	—	—
Philippines	61136.00	—	—	69.08	—
Rep Of Korea	43410.00	—	—	—	100.00
Sri Lanka	17617.00	—	—	60.22	—
Thailand	55538.00	—	—	73.96	—
Vietnam	67400.00	17.36	—	—	—
Total	1650604	7	3	4	4

Annex III

Index of Figures

Water Supply – Latin America & Caribbean

- 1.1 Proportion of population served by technology types.
- 1.2 Number of people served by technology types.
- 1.3 Total number of people served by technology types.

Water Supply – Africa

- 2.1 Proportion of population served by technology type.
- 2.2 Number of people served by technology types.
- 2.3 Total number of people served by technology types.

Water Supply – Western Asia

- 3.1 Proportion of population served by technology types
- 3.2 Number of people served by technology types.
- 3.3 Total number of people served by technology types.

Water Supply – Asia & Pacific

- 4.1 Proportion of population served by technology types
- 4.2 Number of people served by technology types.
- 4.3 Total number of people served by technology types.

Sanitation – Latin America & Caribbean

- 5.1 Proportion of population served by technology types.
- 5.2 Number of people served by technology types.
- 5.3 Total number of people served by technology types.

Sanitation – Africa

- III-6.1 Proportion of population served by technology type.
- III-6.2 Number of people served by technology types.
- III-6.3 Total number of people served by technology types.

Sanitation – Western Asia

- 7.1 Proportion of population served by technology types
- 7.2 Number of people served by technology types.
- 7.3 Total number of people served by technology types.

Sanitation – Asia & Pacific

- 8.1 Proportion of population served by technology types
- 8.2 Number of people served by technology types.
- 8.3 Total number of people served by technology types.

Water Supply – Global Served and Unserved by Region

- 9.1 Proportion of population served/unserved.
- 9.2 Total number of population served/unserved.

Sanitation – Global Served and Unserved by Region

- 10.1 Proportion of population served/unserved.
- 10.2 Total number of population served/unserved.

FIGURE 1.1

**Water Supply:
Latin America &
Caribbean**

Proportion of population served by technology types.

Source: JMP - 1991

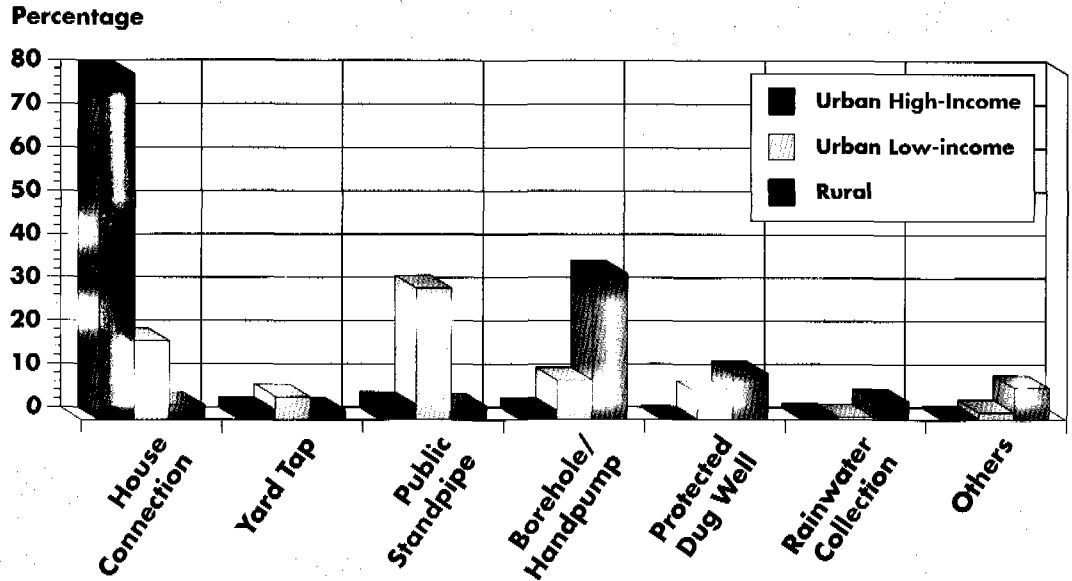


FIGURE 1.2

**Water Supply:
Latin America &
Caribbean**

Number of people served by technology types.

Source: JMP - 1991

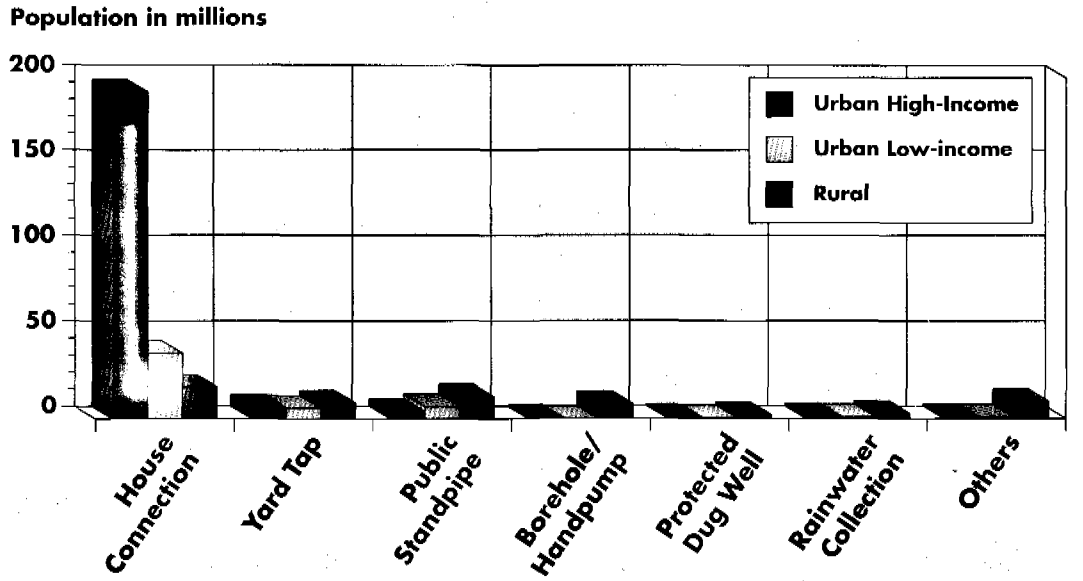
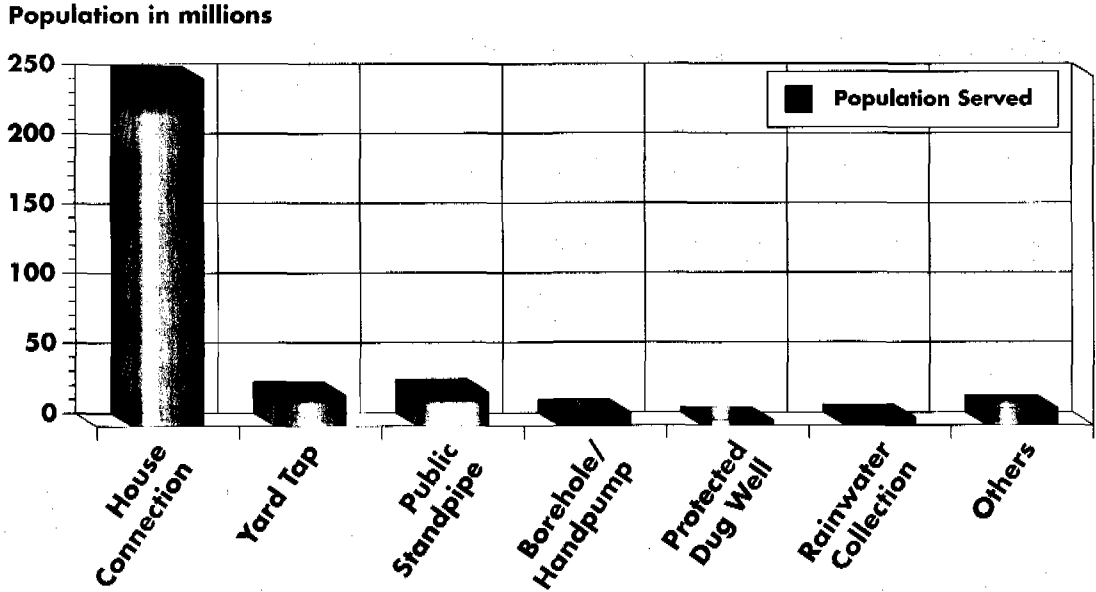


FIGURE 1.3

**Water Supply:
Latin America &
Caribbean**

Total number of people served by technology types.

Source: JMP - 1991



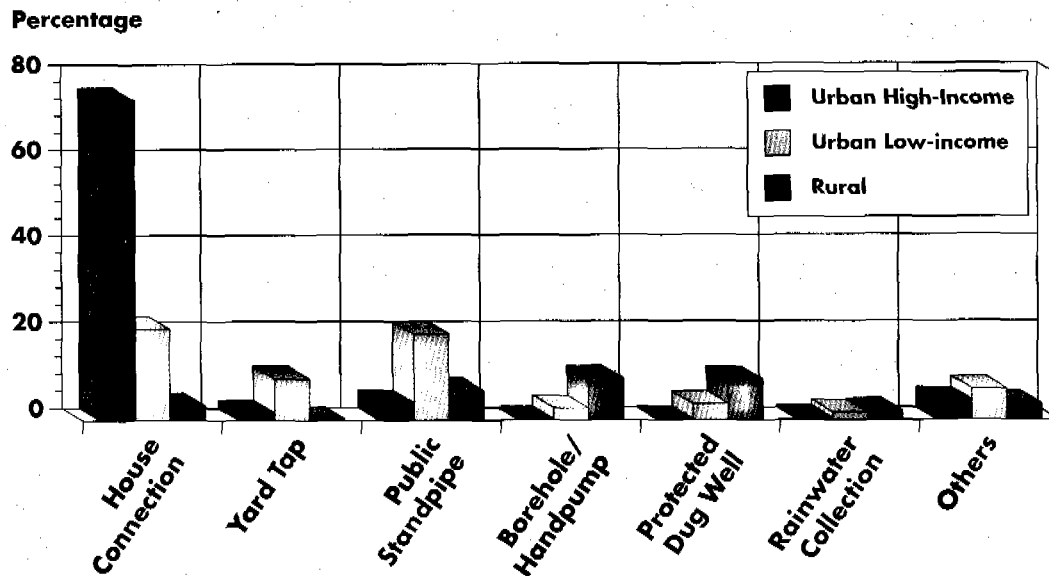


FIGURE 2.1

Water Supply: Africa

Proportion of population served by technology types.

Source: JMP - 1991

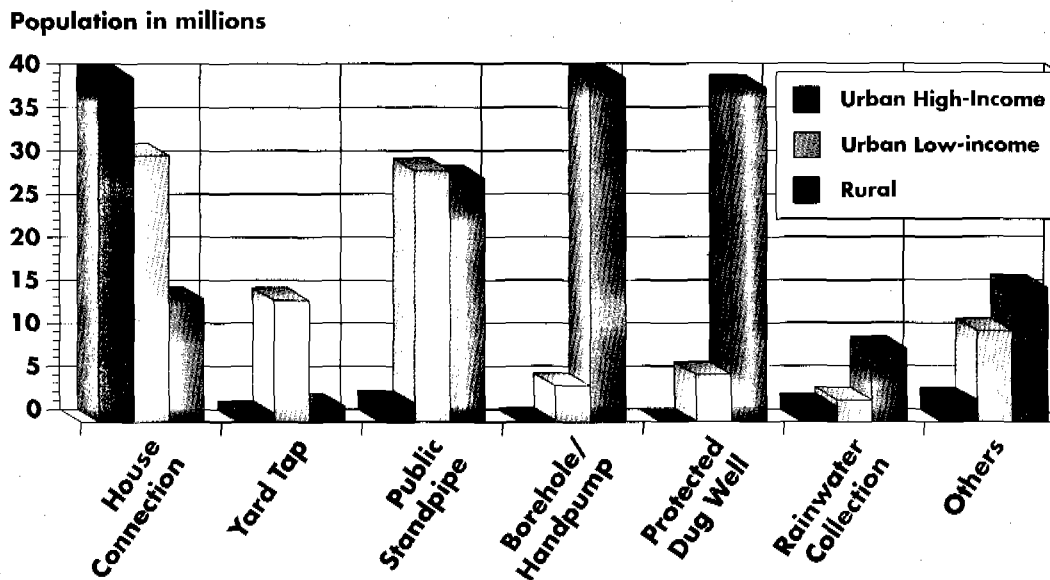


FIGURE 2.2

Water Supply: Africa

Number of people served by technology types.

Source: JMP - 1991

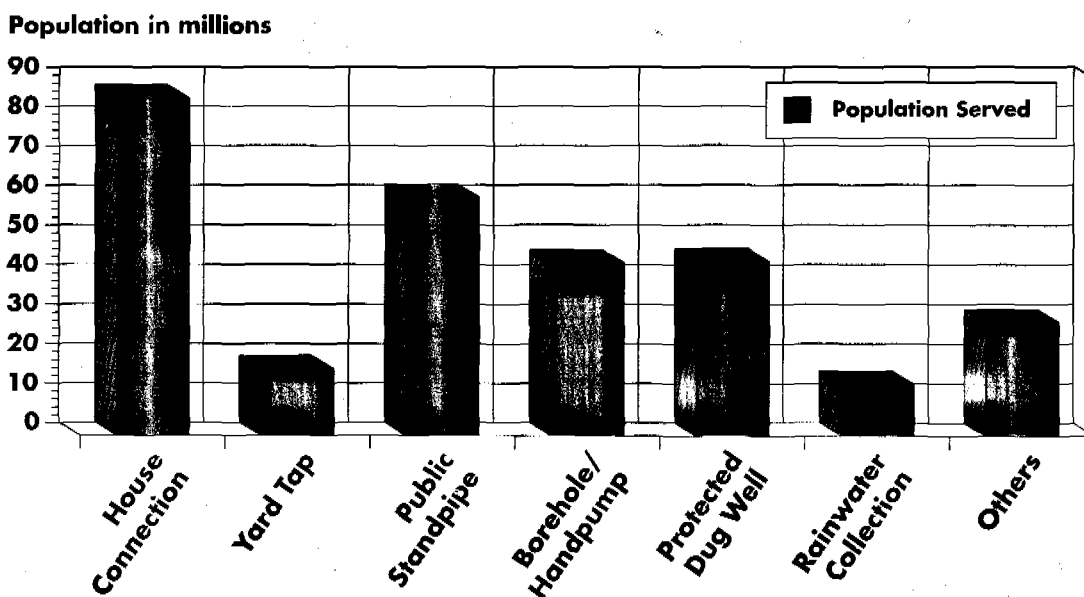


FIGURE 2.3

Water Supply: Africa

Total number of people served by technology types.

Source: JMP - 1991

FIGURE 3.1

**Water Supply:
Western Asia**

Proportion of population served by technology types.

Source: JMP - 1991

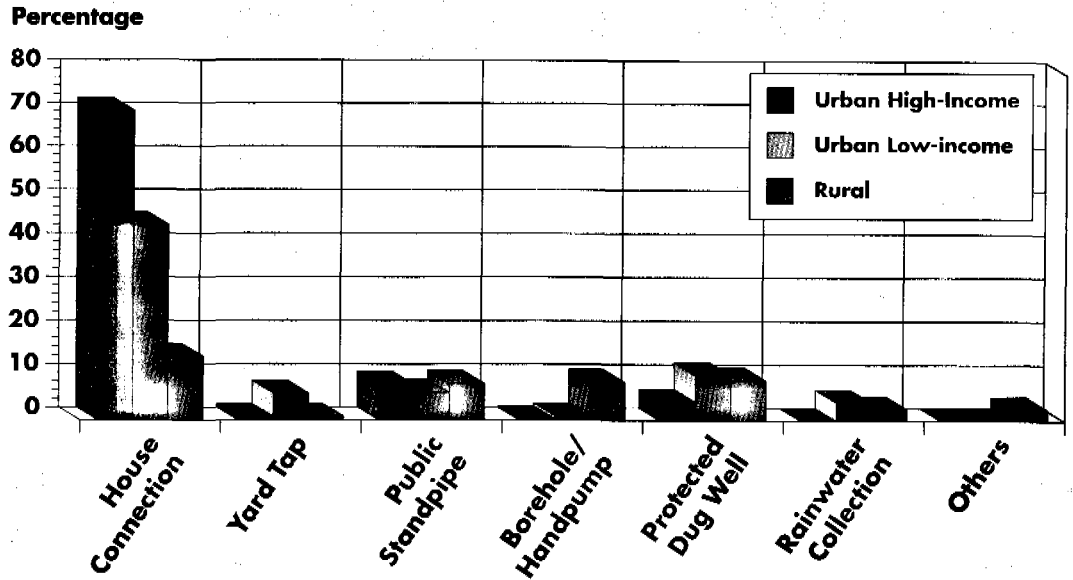


FIGURE 3.2

**Water Supply:
Western Asia**

Number of people served by technology types.

Source: JMP - 1991

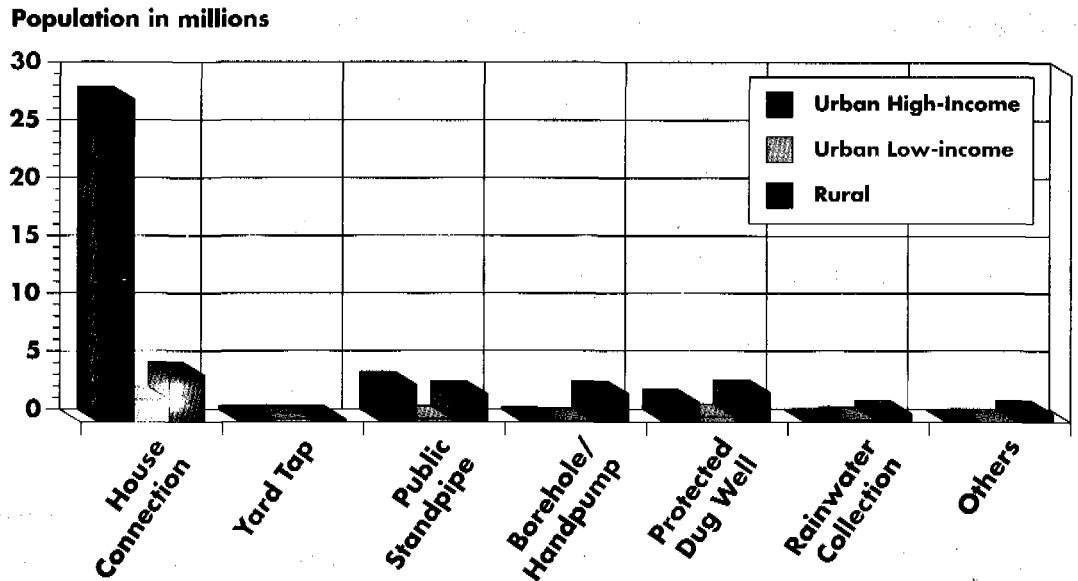
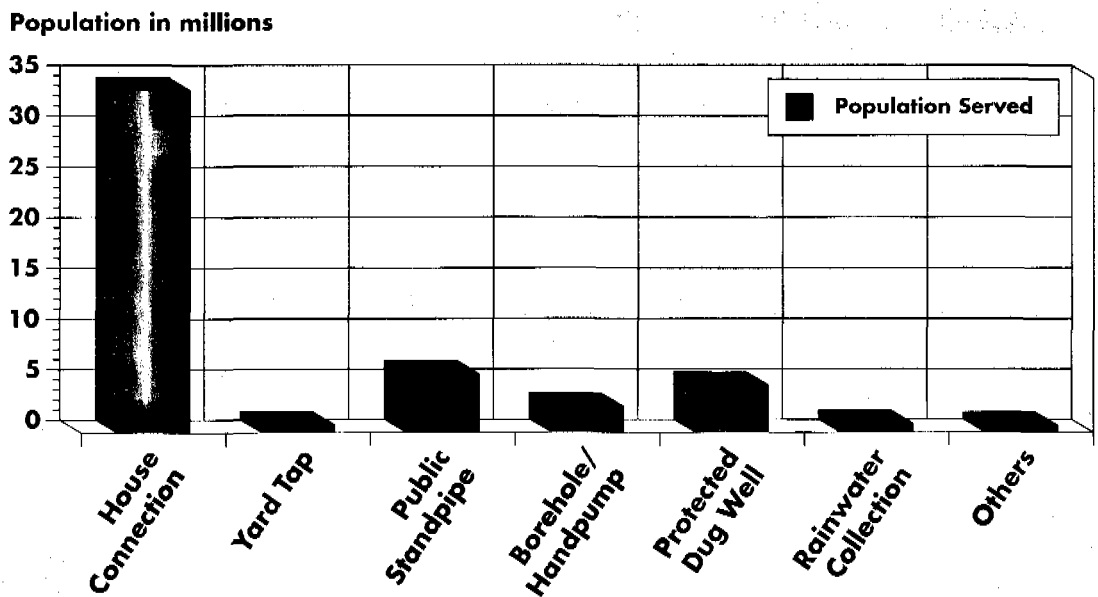


FIGURE 3.3

**Water Supply:
Western Asia**

Total number of people served by technology types.

Source: JMP - 1991



Percentage

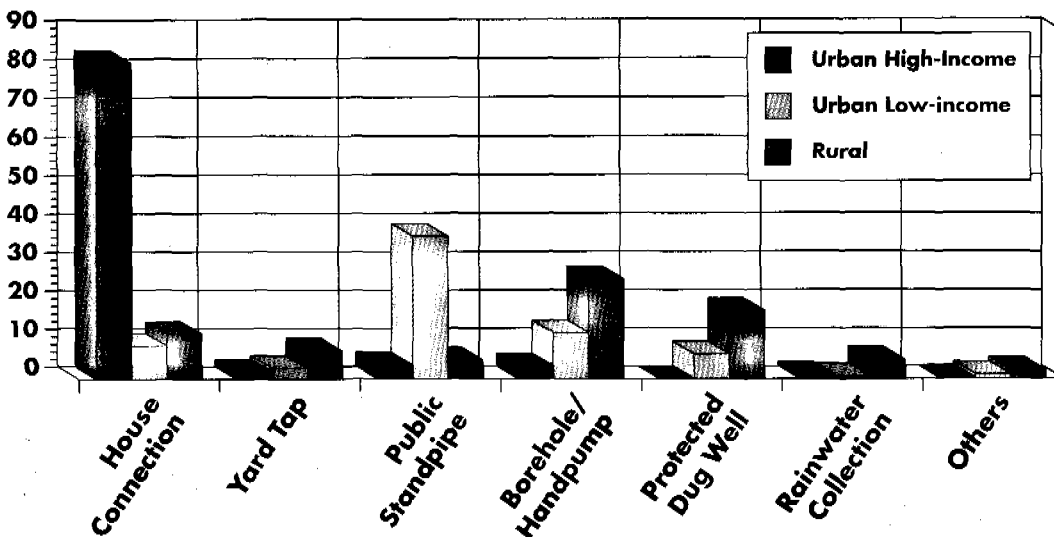


FIGURE 4.1

Water Supply: Asia & Pacific

Proportion of population served by technology types.

Source: JMP - 1991

Population in millions

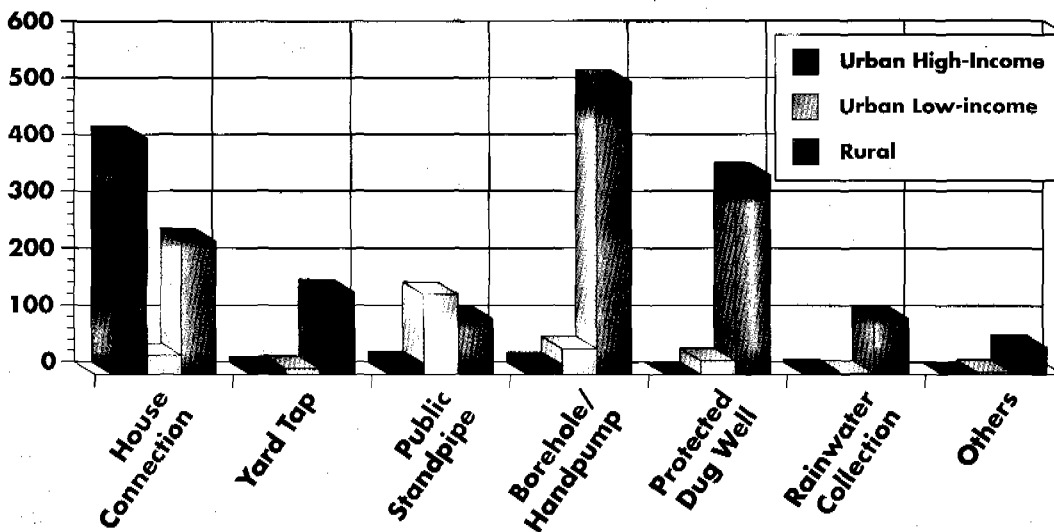


FIGURE 4.2

Water Supply: Asia & Pacific

Number of people served by technology types.

Source: JMP - 1991

Population in millions

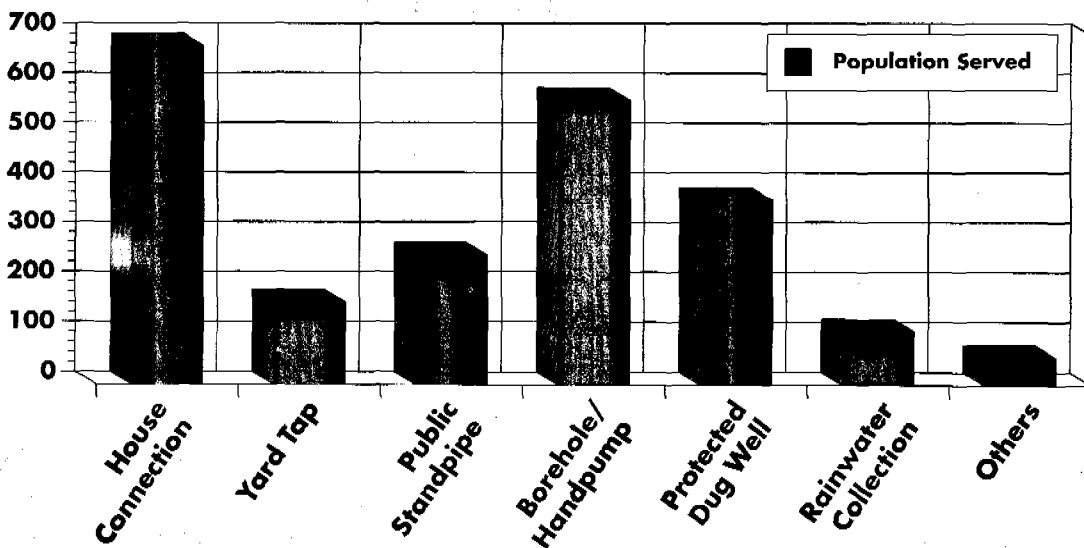


FIGURE 4.3

Water Supply: Asia & Pacific

Total number of people served by technology types.

Source: JMP - 1991

FIGURE 5.1

**Sanitation:
Latin America &
Caribbean**

Proportion of population served by technology types.

Source: JMP - 1991

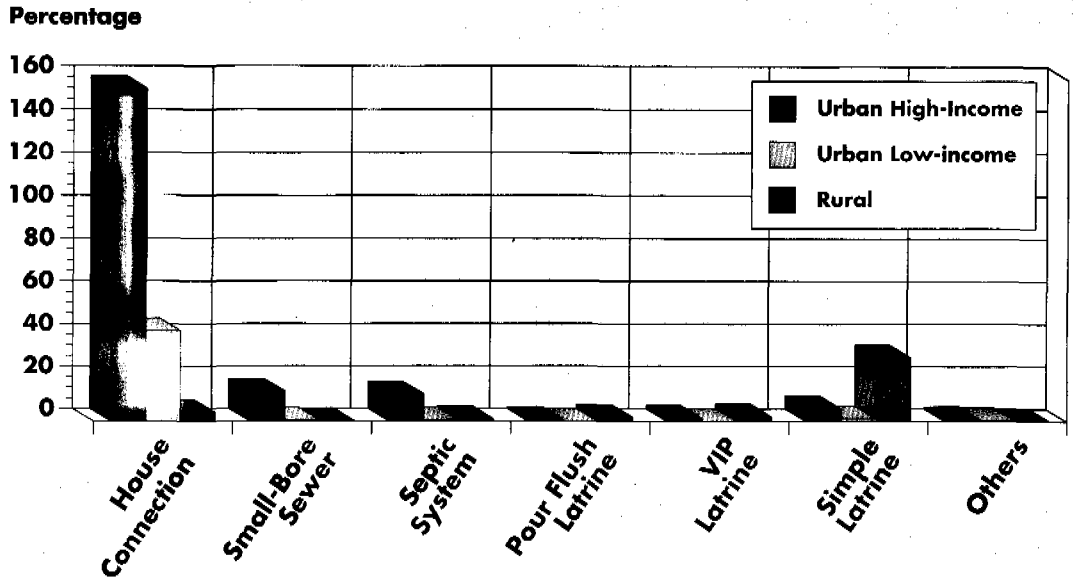


FIGURE 5.2

**Sanitation:
Latin America &
Caribbean**

Number of people served by technology types.

Source: JMP - 1991

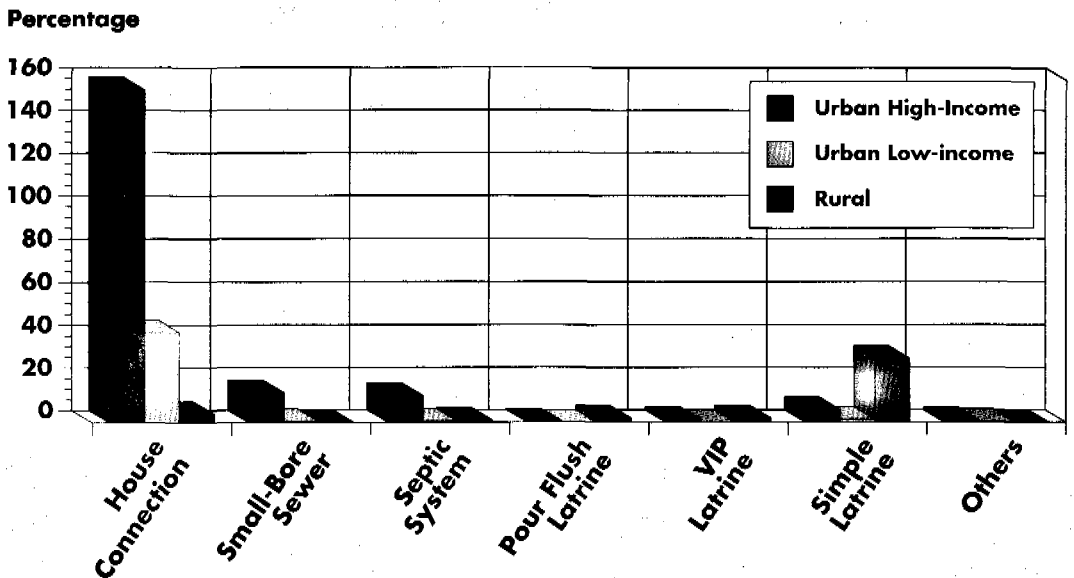
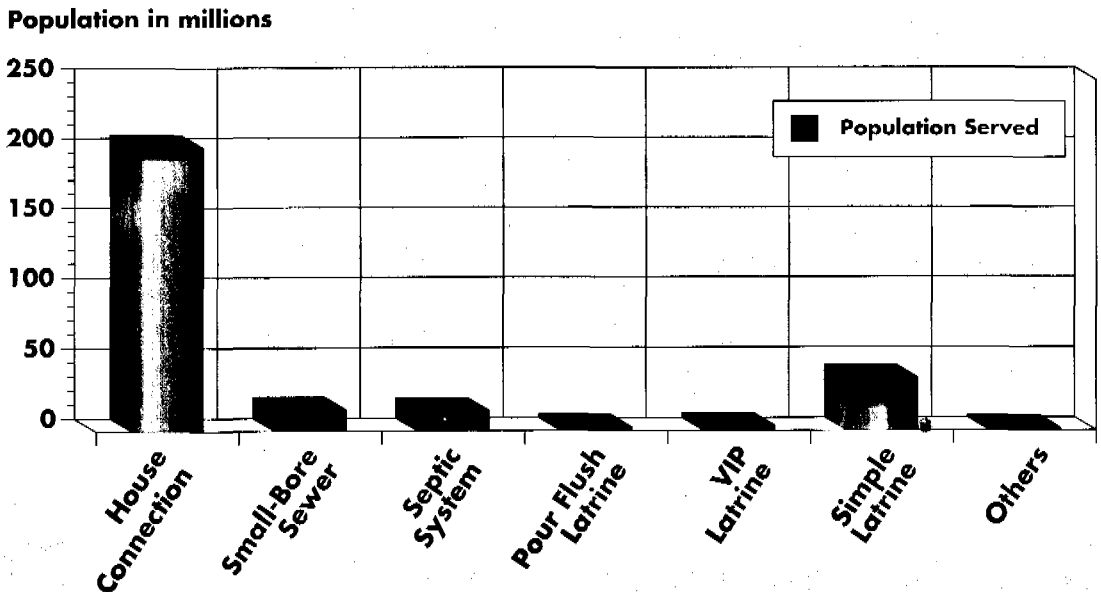


FIGURE 5.3

**Sanitation:
Latin America &
Caribbean**

Total number of people served by technology types.

Source: JMP - 1991



Percentage

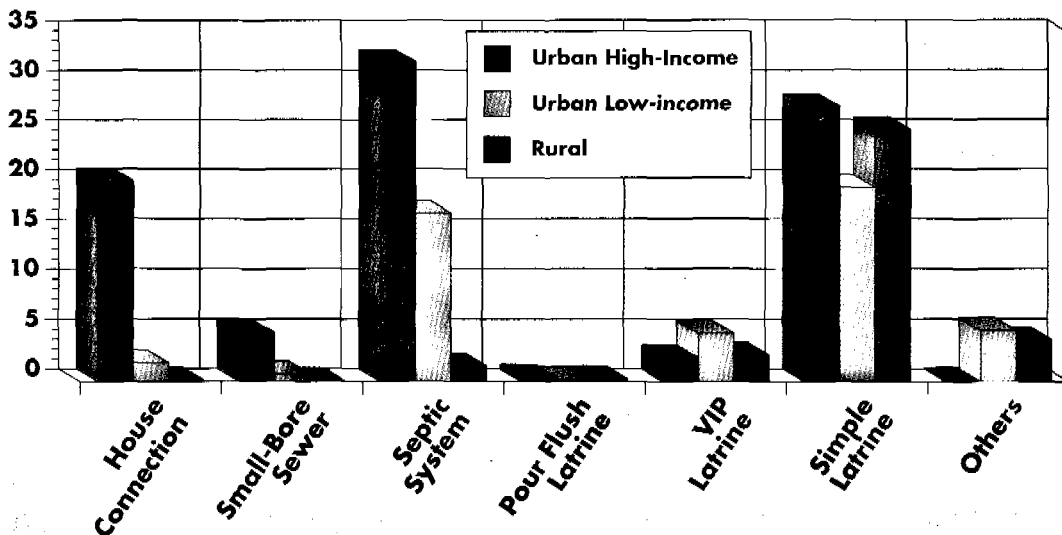


FIGURE 6.1

Sanitation: Africa

Proportion of population served by technology types.

Source: JMP - 1991

Population in millions

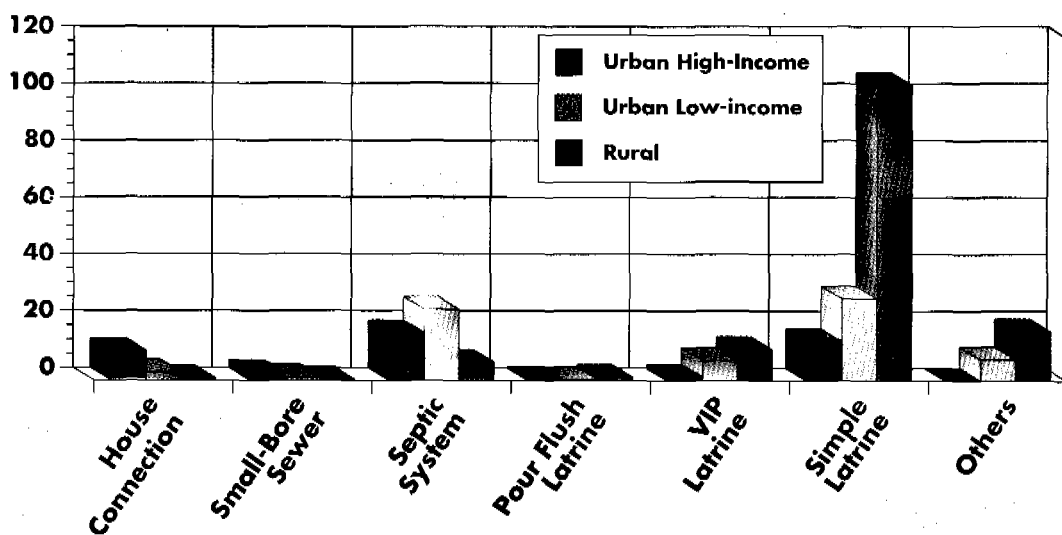


FIGURE 6.2

Sanitation: Africa

Number of people served by technology types.

Source: JMP - 1991

Population in millions

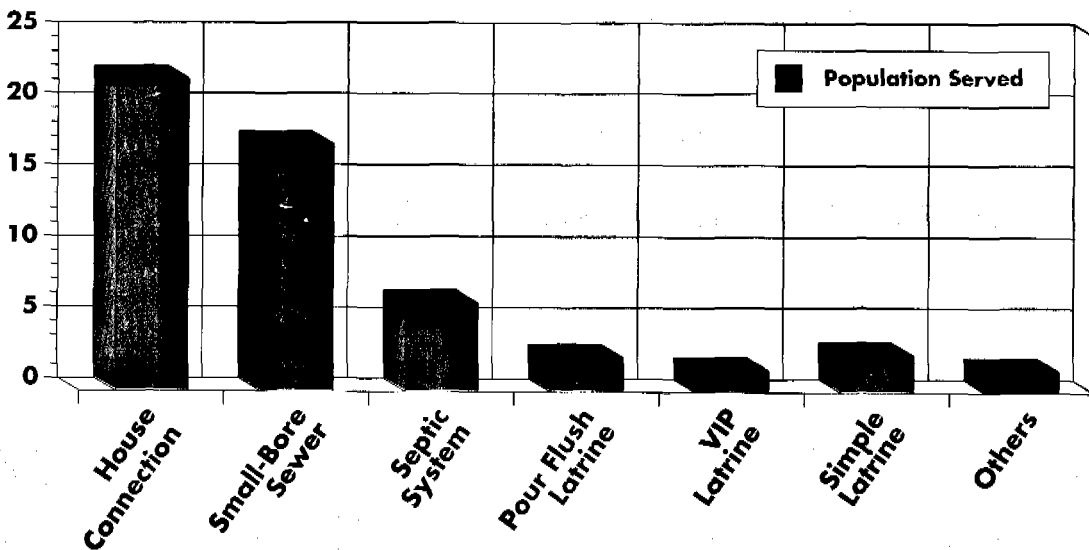


FIGURE 6.3

Sanitation: Africa

Total number of people served by technology types.

Source: JMP - 1991

FIGURE 7.1

**Sanitation:
Western Asia**

Proportion of population served by technology types.

Source: JMP - 1991

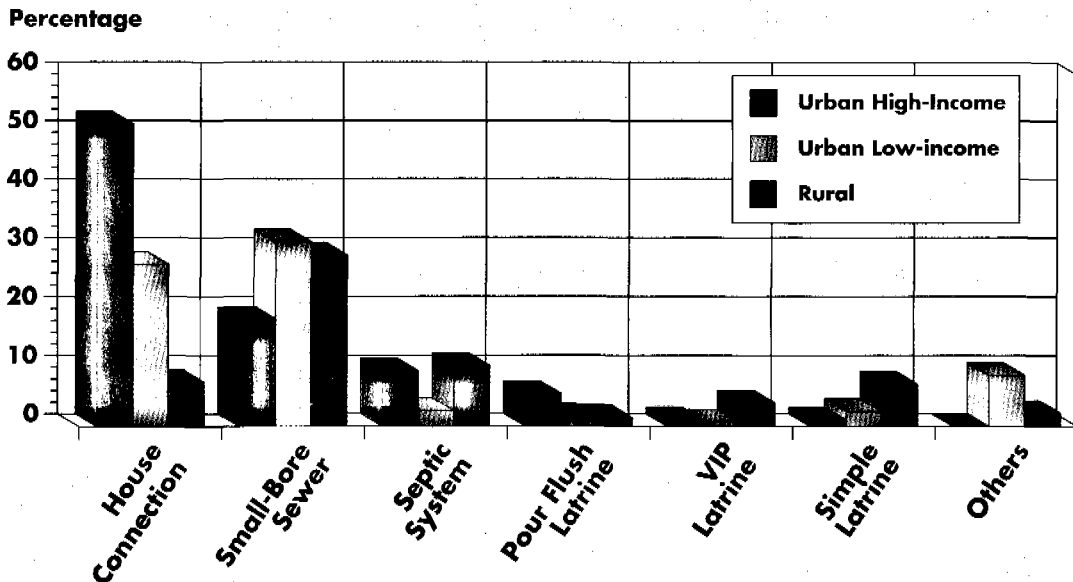


FIGURE 7.2

**Sanitation:
Western Asia**

Number of people served by technology types.

Source: JMP - 1991

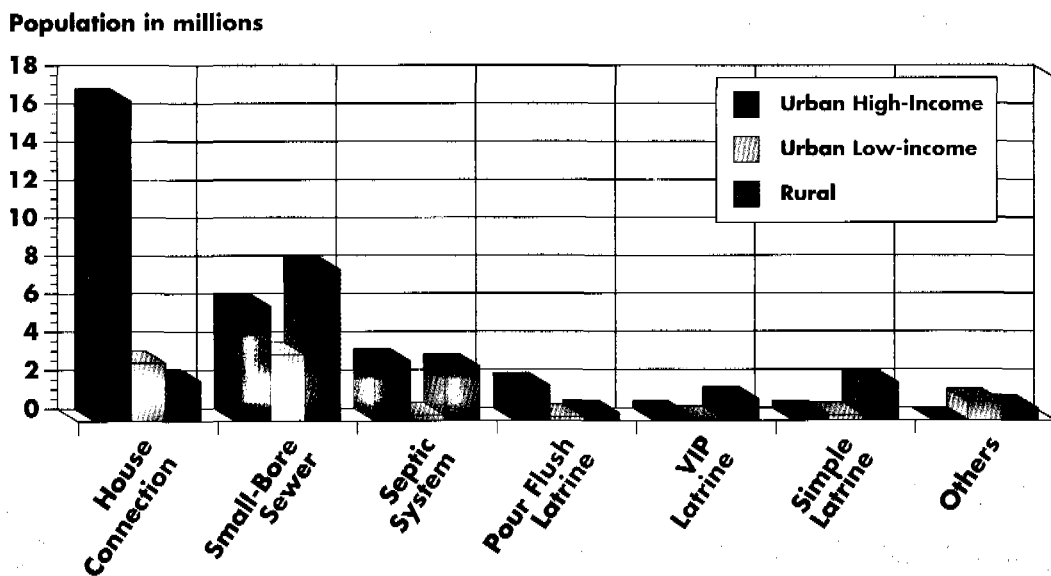
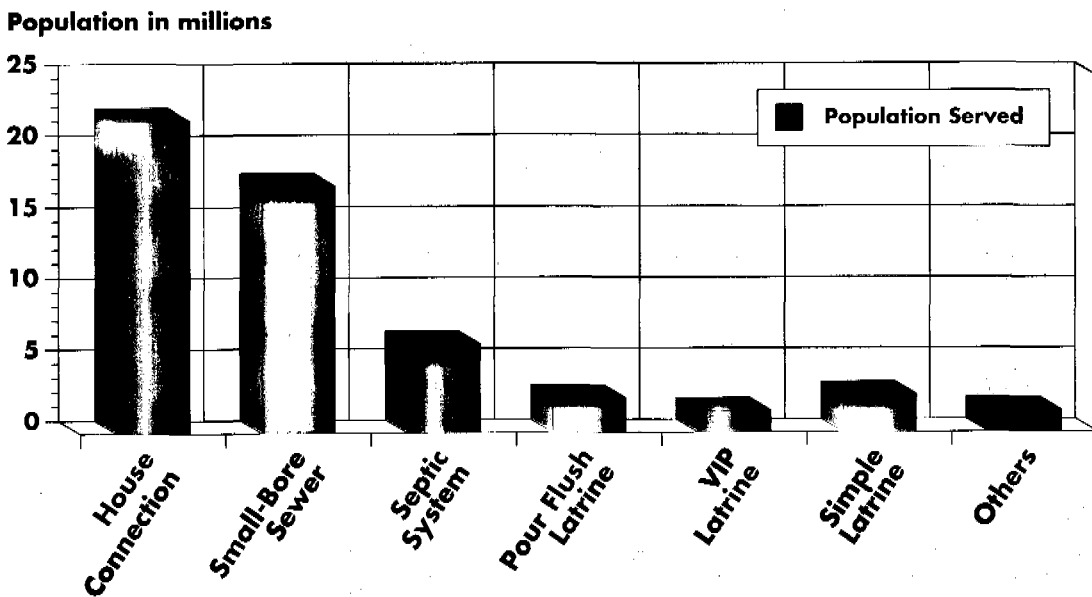


FIGURE 7.3

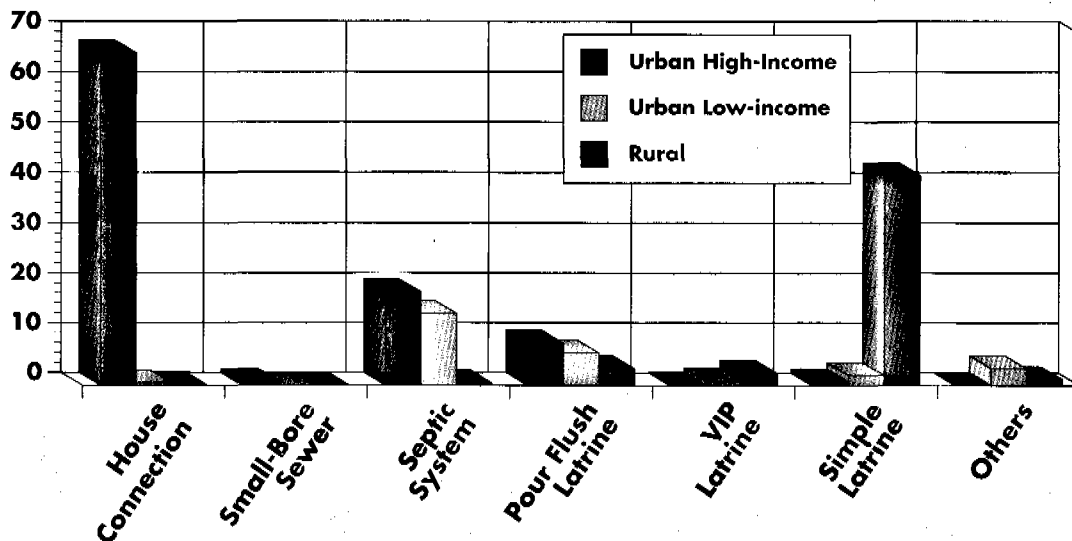
**Sanitation:
Western Asia**

Total number of people served by technology types.

Source: JMP - 1991



Percentage



**Sanitation:
Asia & Pacific**

Proportion of population served by technology types.

Source: JMP - 1991

FIGURE 8.2

**Sanitation:
Asia & Pacific**

Number of people served by technology types.

Source: JMP - 1991

Population in millions

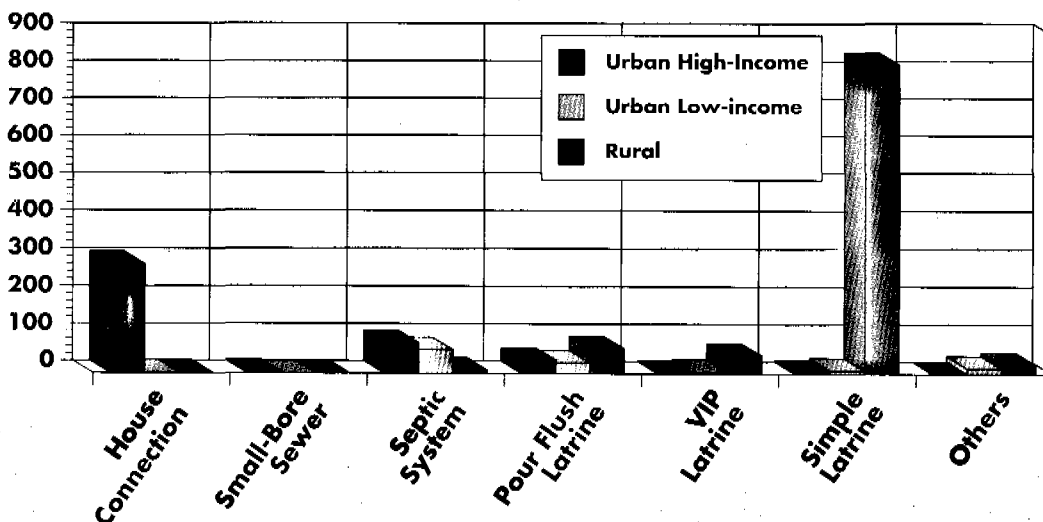


FIGURE 8.3

**Sanitation:
Asia & Pacific**

Total number of people served by technology types.

Source: JMP - 1991

Population in millions

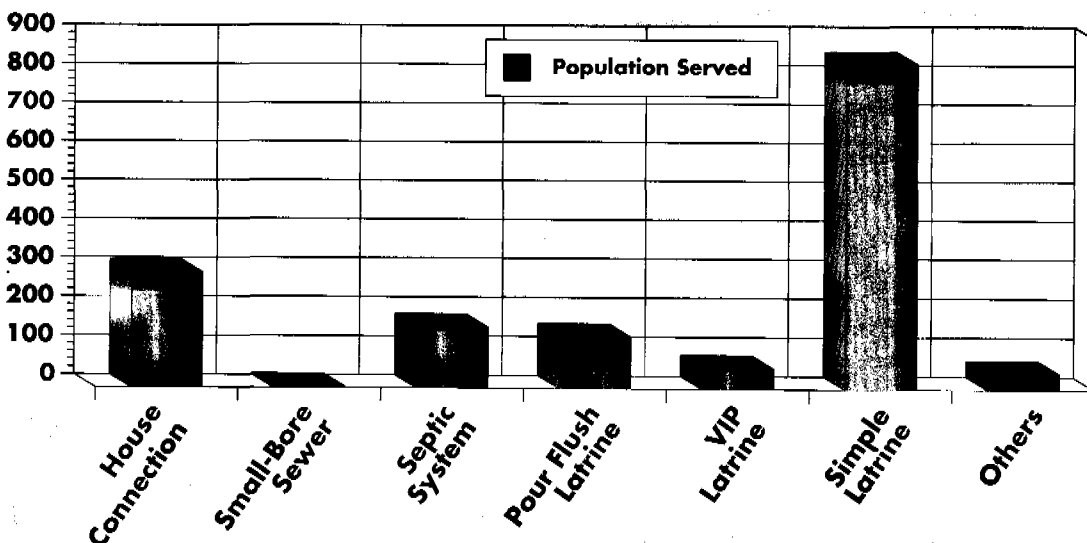


FIGURE 9.1

Water Supply: Global Served and Unserved by Region

Proportion of population served/unserved

Source: JMP - 1991

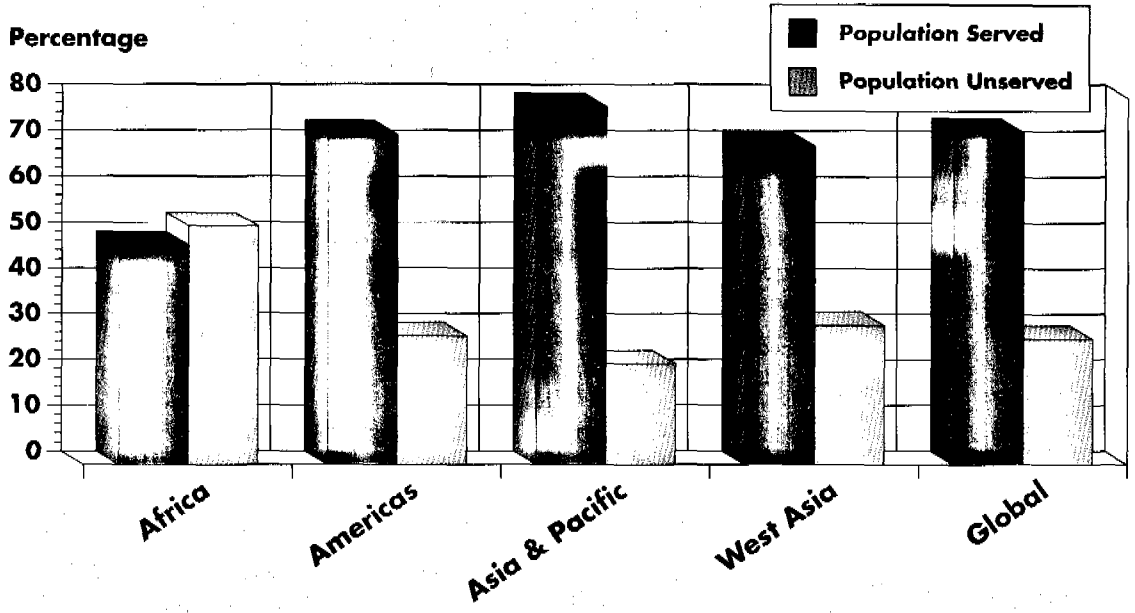
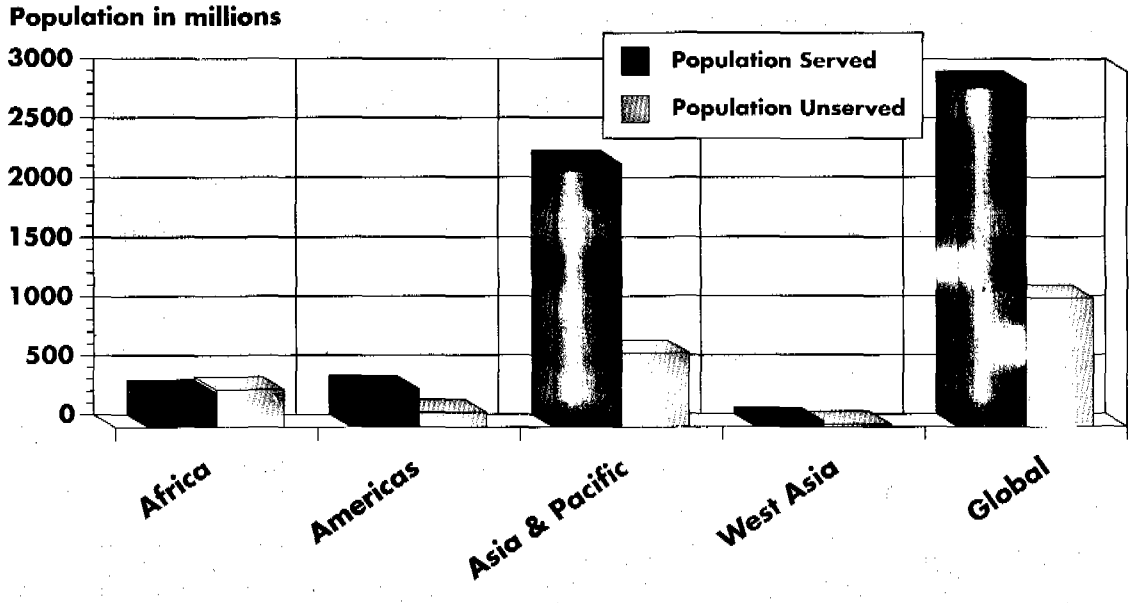


FIGURE 9.2

Water Supply: Global Served and Unserved by Region

Total number of people served/unserved.

Source: JMP - 1991



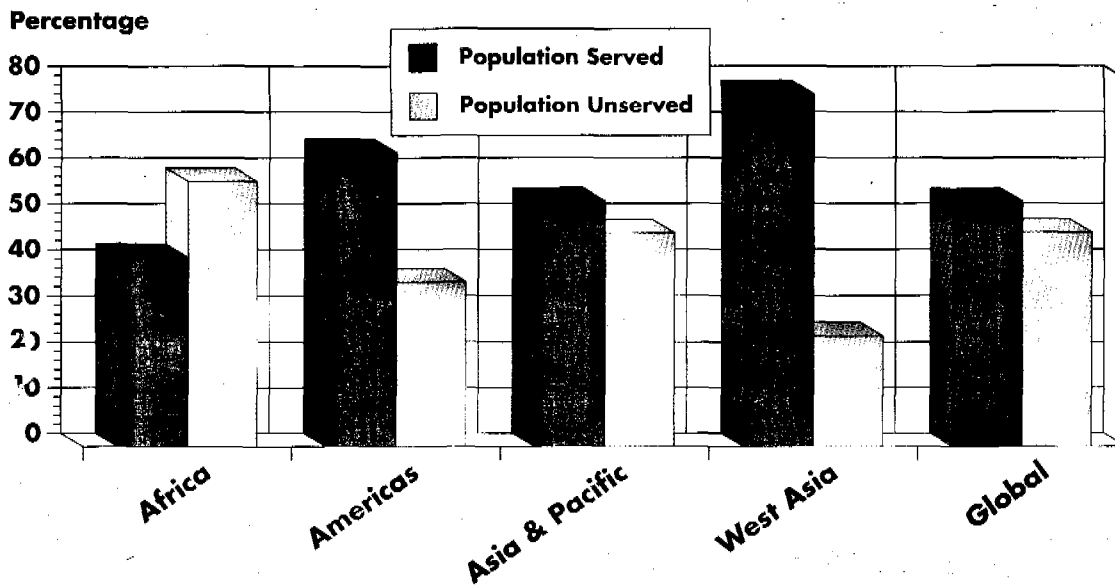


FIGURE 10.1

**Sanitation:
Global Served
and Unserved
by Region**

Proportion of
population
served/unserved.

Source: JMP - 1991

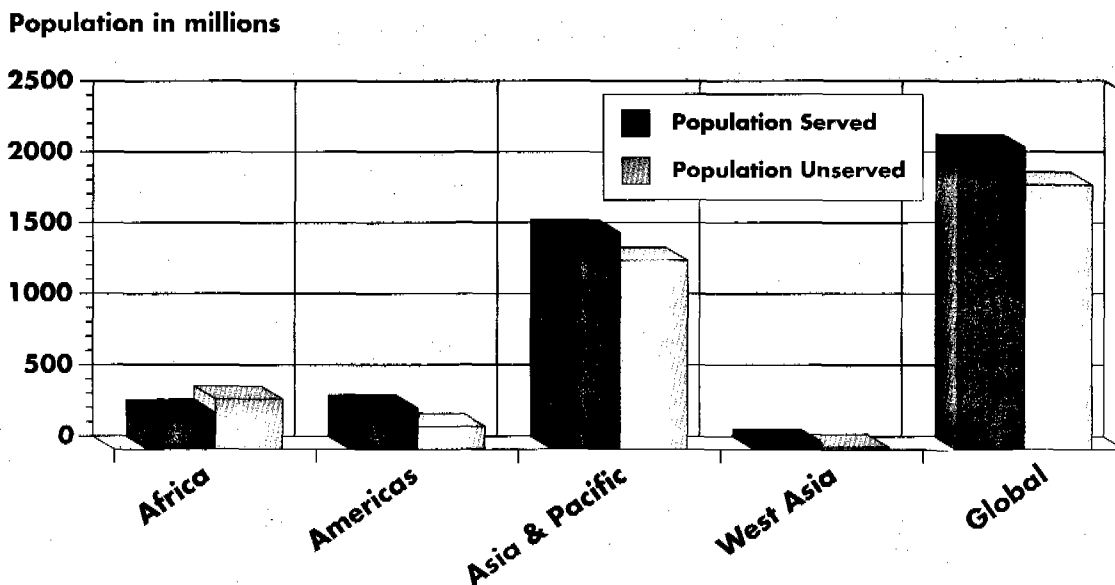


FIGURE 10.2

**Sanitation:
Global Served
and Unserved
by Region**

Total number of people
served/unserved.

Source: JMP - 1991

WHO/UNICEF Joint Monitoring Programme

The Water Supply and Sanitation Sector Monitoring Report 1993 provides a review of the progress made to date in implementing the WHO/UNICEF Joint Water Supply and Sanitation Monitoring Programme. It furnishes an overview of the status of water supply and sanitation services in the world's developing countries, and provides examples of how monitoring has developed in selected countries. It also provides information on a regional basis which can be used to perform more detailed sector analyses.

The publication contains preliminary data on sector coverage, management and funding provided by 82 governments out of approximately 130 countries invited to participate. This increased return rate from 1990 of approximately 68 per cent indicates that there is a growing awareness of the value of monitoring for water supply and sanitation development.

The report places particular emphasis on the development of monitoring capability and experience at country level where the main benefits in terms of improved sector planning and management will be realized. In doing so it is intended that the focus is a national initiative, and the orientation of the Joint Monitoring Programme is to support this.

The report also presents global and regional information in terms of the proportion of the population and numbers of people unserved to draw attention to the challenge facing countries and the global community in attaining the Goals for Children and Development in the 1990s and Health for All by the Year 2000 for universal access to adequate and safe water supply and appropriate means of excreta disposal.

For additional information or copies of this report, please write to:



The Chief
Water and Environmental Sanitation Section
UNICEF, DH40B
Three United Nations Plaza
New York, NY 10017
Fax Number: (212) 702-7150

or



The Manager
Community Water Supply and Sanitation
EHE/CWS
World Health Organization
1211 Geneva 27, Switzerland
Fax Number: (41 22) 788 4226

The countries shown in colour on the front cover are those which responded to the WASAMS 1991 data collection exercise.