Community Water Supply and Sanitation in South-East Asia Region

International Drinking Water Supply & Sanitation Decade
Achievements and Perspectives to the 1990s

WORLD HEALTH ORGANIZATION
Regional Office for South-East Asia

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WORLD HEALTH ORGANIZATION
Regional Office for South-East Asia
New Delhi, India
February 1993

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FOREWORD

The relationship of water supply and sanitation to waterborne diseases and their impact on health has long been recognized by governments in developing countries. Yet diarrhoeal diseases caused by unsafe water and lack of proper sanitation continue to exact a heavy toll in morbidity and mortality, particularly among children. Provision of safe water supply and sanitation is, therefore, recognized as one of the key elements of primary health care (PHC) for achieving WHO's social goal of Health for All. It is for this reason that WHO has been actively collaborating with Member Countries and other international agencies to increase access to safe water supply and adequate sanitation for unserved and underserved populations.

Significant achievements in water supply and sanitation coverage were made during the International Drinking Water Supply and Sanitation Decade, with many more millions of people having access to water supply and sanitation facilities. In assessing the Decade, one can cite impressive numbers of new people served but one must also underscore the fact that, at the end of the Decade, results have fallen short of expectations and coverage has not kept up with population growth, particularly in the rapidly expanding urban areas. Illiteracy, poverty, economic constraints, lack of resources and rapid population growth still impede the progress in water supply and sanitation in many countries of the South-East Asia Region.

The review of the Decade indicates that even greater commitments and efforts on the part of Member Countries will be required in the 1990s to attain their goals to provide all people with access to safe water supply together with sanitation and thereby improve their health and quality of life. The major challenge in the coming years for many countries of the Region lies in finding appropriate approaches to the improvement of sanitation which could be accomplished by the people themselves without relying on the government. The need for innovation based on community participation, particularly women, will be essential. I hope, therefore, that the information in this document will be of value to countries and others for accelerating coverage and monitoring the progress so as to reach the targets by the end of this century.

Ko Ko.

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PREFACE

The International Drinking Water Supply and Sanitation Decade (IDWSSD) 1981-1990 was a period of accelerated and concerted efforts by governments and international agencies to extend water supply and sanitation services to the unserved and underserved populations of developing countries of the world.

During this period the World Health Organization, in response to the need identified in the Plan of Action resulting from the United Nations Water Conference, Mar del Plata, Argentina, in 1977, intensifed the water and sanitation sector monitoring efforts it had initiated in the early 1960s. At the start of the Decade, the WHO Regional Office for South-East Asia published the Decade Commencement Report[1] that provided baseline information on water supply and sanitation in each country of the Region at the end of 1980. During the course of the Decade, at the end of 1983, 1985 and 1988, coverage data on prescribed format were obtained from SEAR countries, analysed and compiled by WHO Headquarters, and a publication entitled "IDWSSD - Review of National Progress", was prepared presenting the status of water supply and sanitation nationally, regionally and globally. The status at mid-Decade was also reviewed and presented at the WHO South-East Asia Regional Committee. An end-Decade document entitled "General Overview of the International Drinking Water Supply and Sanitation Decade in South-East Asia Region" was presented to the 44th session of the WHO South-East Asia Regional Committee in 1991. It described the achievements made by each country during the Decade, the constraints it had identified and the actions to be taken in the 1990s to complete the initiatives begun in the Decade. Furthermore, the 44th session of the Regional Committee, responding to calls by countries for increased and improved action in their implementation of water supply and sanitation programmes, passed a resolution (SEA/RC44/R7) urging Member States *inter alia* to reaffirm the priority to safe water supply and sanitation programmes in the 1990s.

This document, while summarizing the updated sector achievements in the Region, presents the water supply and sanitation coverage targets by the year 2000 and the accelerations in programme delivery required in the 1990s to reach them.

The information presented in this document is based on data provided to WHO by national agencies and on reports prepared by national experts who reviewed the sector situation in consultation with the sector agencies. Every effort has been made to ensure the authenticity of the information presented. However, in the absence of arrangements for the systematic collection of information and computerized facilities, errors may have occurred and it would, therefore, be appreciated if readers could provide additional information to SEARO.

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[1]WHO, SEARO, Regional Health Paper No.1, IDWSS DECADE COMMENCEMENT REPORT

PART - I

REGIONAL

1. INTRODUCTION

This document presents an overview and assessment of water supply and sanitation in the South-East Asia Region of WHO. It describes the achievements made by each country during the International Drinking Water Supply and Sanitation Decade (IDWSSD) from 1981 to 1990, the constraints, and the areas of action in the 1990s to complete the initiatives begun in the Decade. The role which WHO may play in supplementing national efforts is also outlined.

Baseline data were compiled at the beginning of the Decade (SEAR Health Paper No.1), and mid-Decade data compiled by WHO Headquarters based on the reported coverage status at the end of 1983, 1985, and 1988, and at the end of 1990 as presented in the final report on IDWSSD to the World Health Assembly in 1992 (WHO/CWS/92.12) have been utilized in the preparation of this report. The data relating to the situation at the end of 1990 have been updated based on the latest information received from SEAR countries.

2. DECADE ACHIEVEMENTS

The launching of the International Drinking Water Supply and Sanitation Decade (1981-1990), by the United Nations General Assembly in November 1980, had the effect of mobilizing all Member States to prepare programmes which would provide all people with better access to safe water and adequate sanitation by 1990, if possible. In several countries of South-East Asia, which had previously only paid relatively little attention to water supply and sanitation, especially in rural areas, the backlog was formidable. Nevertheless, without exception, assessments of the situation were made and plans prepared for service coverage targets by the end of the Decade. These targets necessarily fell short of the total coverage goals idealistically called for in the UN resolution, but in all cases the concept of the Decade was adopted, awareness was promoted among authorities and communities, and allocations to the sector were increased.

During the Decade, the population of the Region grew from 1,018.6 million to 1,263 million, an increase of 244.4 million or 24%. This increase was more prominent in the urban areas with a growth of 42% as compared to rural areas which recorded an 18.7% increase, reflecting the migration of the population to the urban centres. The population growth of about 2.1% eroded coverage during the Decade. However, there has been significant improvement in water supply and sanitation coverage during the Decade along with improvement in basic health indicators, which could be attributed, at least partially, to improved water supply and sanitation coverage. Infant mortality declined significantly during the Decade and life expectancy and literacy have shown a marked improvement (Table 1).

Most SEAR countries did not meet the decade target they had set; there has, however, been a considerable general increase in the numbers of people served with safe water and adequate sanitation facilities during the Decade, particularly in regard to rural water supplies. In rural areas, by the year 1990, 374 million more people had access to safe water supplies

than in 1980, and this compares favourably with the rural population increase of just over 140 million. Less impressive are the figures for urban areas, where a population increase during the Decade of slightly more than 97 million has been matched with increases in water supply and sanitation coverages of about 102 million and 90 millions respectively. Rural sanitation is even less well served with not more than 60 million more people newly served during the Decade (Figure 1).

Country performances varied. Bangladesh was successful in rural water supply but fared poorly in other sectors. Bhutan's urban populations were quite well served. India made impressive advances in water supply coverage, particularly in rural areas, but the situation in regard to sanitation was disappointing In Indonesia, the rural sector increased coverage more rapidly than the urban. Maldives made impressive progress in all sectors except rural sanitation. Urban areas in Mongolia are fully served and rural programmes have been successful. Myanmar has increased the coverage less dramatically but has reported some progress in all sub-sectors. Rural sanitation in Nepal is still relatively weak but progress has been made elsewhere. Sri Lanka has reported successful advances in all sub-sectors, especially rural water supply. Thailand has higher than average coverage figures in all sectors and has made particularly striking advances in rural areas. Tables 2-5 show water supply and sanitation coverage from 1980-1990 for different countries.

Bangladesh, Indonesia, Mongolia, Nepal and Thailand all established inter-ministerial and inter-agency national action committees or their equivalents to provide coordinated guidance to develop sector activities. India, Nepal and Sri Lanka made infrastructural alterations during the course of the Decade to ensure better management, and all countries prepared formal Decade Plans which were given official recognition as part of national development planning.

Apart from the service coverage figures for water supply and sanitation, which are relatively easy to collect and which provide a reasonable indicator of progress towards better health and social development, there are parameters of achievement which are less easy to measure. An obvious example would be health improvement. However, although several countries have reported increased life-expectancy, lower infant and maternal mortality rates, reduction in intestinal infections and diarrhoeal disease, and general improved well-being, all of which are attributed at least partially to improved water supply and sanitation facilities, it will be several years before the complete health benefits of these services can be positively analysed. Nevertheless, there are some specific instances which are worth reporting. One is the striking advance made in India to reduce the incidence of dracunculiasis (Guinea-worm disease), which will probably be eradicated from the country and the world by 1995. Another is the overall 60 per cent reduction of water-borne diseases in the Decade reported by Myanmar.

Less measurable still are the achievements in respect of awareness. At the end of the Decade, there can be few individuals in agencies or government who have not been made aware of the essential role played by better water supply and sanitation in community and national development. There is awareness too at the local level where, during the Decade and as a result of the commitment made by governments to adopt the Decade approach, communities have been exposed to health education, and individuals have been encouraged to join together with officials in improving their own basic facilities in the framework of primary health care.

Villagers have acquired new skills in the operation and maintenance of installed services, women leaders have been mobilized to act as focal points for passing on simple hygiene messages, and foundations have been laid for a simple system of sector information management.

Training of personnel, although still in short supply in most countries, has been strengthened as part of the Decade activities. This has been done in both formal and informal ways and at all levels - from operators and technicians in the field to the decision makers at the central level. In order to promote intersectoral and inter-agency collaboration, several countries, including India, Indonesia, Nepal, Sri Lanka and Thailand, held Decade Consultative Meetings to which representatives of international and bilateral external support agencies were also invited. These served to promote the activities being undertaken and, at the same time, to indicate the projects for which funding was still being sought.

The achievements in the Region during the Decade have been impressive. However, if these are to be sustained and coverage is to be increased by the end of the next Decade to the levels shown in Tables 2 - 5, greatly increased efforts will have to be made in the coming years.

3. DOMINANT ISSUES IN THE 1990s

The reports from the countries of the Region have described the various constraints which have prevented them from making even better progress towards providing total service coverage with safe water supply and adequate sanitation facilities. While there are certain differences and areas of particular concern in the individual Member States, there are many problems and issues which are reported as shared constraints in this chapter.

The end of the decade review of the IDWSSD (WHO/CWS/92.12) summarized the constraints presented by countries and ranked these as shown in Table 6. The most severe constraint identified was funding limitations followed by operation and maintenance, insufficiency of trained personnel and cost recovery through community participation.

Financial Resources

Funding limitations have continued to be cited as the single most serious constraint to the development of water supply and sanitation programmes in South-East Asia, with inadequate cost recovery as one of the third most serious. During the course of the 1980s the perceived importance of inadequate cost recovery as a constraint has increased.

Of the total investment of US$21,104 million during the Decade, around US$9,138 million was from external (bilateral/multilateral) sources. The proportion of sector investment from external sources calculated on the basis of weighted population is about 43%.

The investments, however, vary considerably from country to country. For example, aside from the large international bank loans to the urban sector, India relies very little on external resources to fund its sector activities but could make use of increased governmental allocations to expand them. Maldives, on the other hand, has depended almost entirely on bilateral funding for sector improvements except for basic services to island communities, and

will face problems if further funding of this nature is not forthcoming once the installations in Male are complete. All countries will have to have significantly increased budgetary allocations in the coming decade if the proposed goals for the year 2000 as projected in Tables 2 - 5 are to be achieved.

Cost Recovery

Cost recovery is an issue that is proving difficult to solve. In urban areas, tariffs for water supply and sanitation can be levied. In rural areas, however, water is often considered to be traditionally provided free, and many families do not perceive latrine construction as a priority. As a first step, most governments are trying to ensure that at least the operation and maintenance expenses are covered by community resources, even if installation costs have to depend on government development funds. In time, and as programme benefits are recognized by communities, cost-sharing arrangements, possibly based on revolving funds or readily accessible loans, can be more widely developed.

Infrastructure

Another issue shown as important to all countries is that of lack of infrastructure for drinking water quality surveillance and control, and almost all countries further indicate a need for realigning their institutions for general sector development. An important aspect of this is the decentralization of authority and increased community management of sector facilities. A further part of infrastructural improvement is the question of increased staffing, both professional and sub-professional, required by the sector, as reported by most countries. This is dependent not only on funding but also on the capacity of national institutions to provide the existing and newly-recruited staff with appropriate training.

Manpower training

At the start of the Decade lack of professional and sub-professional staff was considered to be a serious constraint to the expansion of water supply and sanitation services. By the end of the 1980s, poor operation and maintenance had overtaken lack of professional personnel as the second most serious constraint.

Lack of sub-professional personnel also shared the third position in the ranking of constraints with inadequate operation and maintenance and insufficient cost recovery. Poor operation and maintenance is, of course, a constraint to which lack of trained personnel contributes significantly.

All reporting countries indicated that at national level a water supply and sanitation training budget had been established. They reported that between 56 and 401 personnel per million population were engaged in providing services. The median value is 208. By the year 2000 it is anticipated that this number will increase to 258 (Table 7).

Operation and Maintenance

The two issues which feature as the next most frequently cited are related: inadequate operation and maintenance, and lack of community financing and cost recovery. Operation and

maintenance present problems in urban situations through lack of staff and funds to recruit and train them. In rural areas, although efforts have been made to have community members participate in simple activities, this has not always been successful if the community has not been involved in the initial planning, in the location and construction of facilities, and if appropriate promotion and training has not been carefully undertaken. In addition, manuals or illustrative job guides, prepared in simple, local language, have rarely been available, and back-up support for repair work has been missing or delayed.

Community Management

Another constraint has been the difficulty in mobilizing the support of communities, particularly women, for sector programmes. Considerable efforts have been made to introduce health and hygiene education measures related to water supply and sanitation, but results have, in many cases, been disappointing. Community involvement and participation of beneficiaries in the upkeep of installed facilities are essential to the sustainability of sector progress.

Inter-sectoral Cooperation

Among the remaining priority problem areas identified as important by more than half of the countries are weak coordination between the water supply and sanitation sector and other sectors, low priority accorded to sanitation so that the health benefits of complementarity are not realized, little attention paid to environmental degradation, and little involvement of private enterprise in the sector. The other issues although considered critical constraints in some countries, may not be as crucial in others. There are, indeed, some issues which have not been included although they are among the top priorities in particular situations. For instance, the lack of fresh water in Maldives, the shortage of water resources in Mongolia, the logistics problems in Maldives and Bhutan, are all serious constraints which must be addressed in the decade of the 1990s.

It is considered that most of the areas for action are common to all countries of the South-East Asia Region to a greater or lesser degree. Some countries may have additional priority areas where they will need to take action to meet coverage goals. The package of these areas of action provides Member States with guidance for a national strategy to proceed with sector development in the coming years and to approach, as appropriate, external support agencies for collaborative support towards the sector's goals.

4. FOCUS OF WHO SUPPORT

Since the beginning of the Decade, the focus of WHO support to Member States has been on the following five priority areas :

- Promotion of community water supply and sanitation
- National institutional development
- Development of human resources
- Technology development and information exchange
- Mobilization of financial resources.

In the South-East Asia Region, WHO will continue, in the 1990s, to collaborate with responsible government and external support agencies in the water supply and sanitation sector in these areas. The emphasis will be on community participation/management and strengthening of the role of women.

Principally, technical cooperation will be associated with support programmes rather than programmes directly aimed at extending coverage.

The areas which countries have identified as those where WHO's inputs are expected to be beneficial are as follows:

- Development of water quality surveillance and control
- Human resources development and training
- Development of health and hygiene education in water supply and sanitation as part of primary health care
- Development of sector management information systems
- Support to sector development planning
- Development and transfer of appropriate technology
- Strengthening of institutional capability
- Resource mobilization and coordination of external support
- Development and mobilization of ground water, and
- Development of community participation, including community management of facilities with particular emphasis on strengthening the role of women.

5. TASKS BEYOND THE DECADE

With a target of universal coverage in the South-East Asia region of safe water supply and adequate sanitation by the year 2000, the projections for improving coverages for four sub-sectors are as given below (see also Tables 2-5).

Urban Water Supply

Assuming that, by the year 2000, the urban population, will reach 435.5 million - a 33 per cent increase over th. of 1990 - and targeting near or 100 per cent coverage in most countries of the region, the additional urban population required to be covered between 1991 and 2000 would be 156 million. It is hoped that, with less pressure on rural water supplies and greater stress on urban unserved populations, the additional coverage during 1990-2000 could be achieved. The realistic feasible target for the covered population by the year 2000 would

therefore be a total of 405.7 million, with an estimated percentage of coverage of 93 as against the 1990 coverage of 76 per cent.

Rural Water Supply

Assuming that the rural population by the year 2000 will reach 1081 million, a 15 per cent increase over that of 1990, and targeting near or 100 per cent coverage, the additional population in rural areas required to be covered between 1991 and 2000 would be 406 million. The target coverage by the year 2000 can therefore be achieved if the present momentum is maintained. The percentage of population covered in that case will increase to 95 by the year 2000 as against the 1990 coverage of 66 per cent.

Urban Sanitation

Assuming that the urban population by the year 2000 will reach 435.5 million with target coverage, the population to be covered between 1991 and 2000 has to be increased to 190 million. The target of additional population coverage between 1990-2000 may be assumed realistic with an estimated coverage of 80 per cent as against 48 per cent in 1990.

Rural Sanitation

Assuming that the rural population by the year 2000 will reach 1081 million with the established target coverage, the additional population to be covered between 1991 and 2000 has to be increased to 654 million. Even with the best efforts for acceleration, an additional population of only about 300 million will be covered between 1991-2000, and the percentage coverage is therefore not likely to reach the desired 70 per cent by 2000 against 11.5 per cent in 1990.

The task to be accomplished between 1990-2000 is enormous and the investment for newer systems and the rehabilitation of existing systems will have to be increased manifold. The major constraint will therefore be the generation of financial resources in the 1990s. The importance of introducing viable O&M strategies to safeguard and extend the life of existing systems and thus allowing financial resources to be utilized for new systems and expansions cannot be underestimated.

6. AREAS OF ACTION IN THE 1990s

Institutional

1. Periodic review and updating of national sector plans.

2. Institutional realignment and strengthening.

3. Integrated management of water resources, with emphasis on pollution control and protection of surface and groundwater.

4. Incorporation of environmental protection measures in sector activities, particularly solid and liquid municipal and industrial wastes management and drainage.

5. Water quality surveillance and control.

6. Promotion of hygiene for proper use of water supply and sanitation facilities.

7 Community management of services, with emphasis on involvement of women.

8. Better information management for monitoring of the sector and its health impact.

Financial

9. Increased provisions in national development plans in recognition of the priority accorded to the sector.

10. Increased investment in the sector from internal and external sources, particularly from the private sector, and better financial management.

11. Allocation of adequate resources for the implementation of support programme components of projects.

12. Community cost-sharing and mobilization of local resources.

Operational

13. Human resources development based on studies of manpower needs.

14. Improved operation and maintenance procedures and mechanisms.

15. Higher priority to sanitation to establish its complementarity with water supply.

16. Increased transfer of technology for local production of materials and equipment.

Table 1: BASIC INDICATORS : DEMOGRAPHIC, ECONOMIC & HEALTH

Country/ Territory	Population (Million)		Population growth rate (%)		Life Expectancy at birth (Years)		Real GDP per caput (US$)		Infant Mortality (%)		Estimated episodes of diarrhoea per child <5 years per year	Population without safe water (Millions)		Population without sanitation (Millions)		Adult Literacy (%)	
	1980	1990	1980[1]	1991[2]	1980[1]	1985-1990[2]	1979[1]	1989[2]	1980	1990	1990	1980[1]	1990[2]	1980[1]	1990[2]	1980[1]	1990[2]
Bangladesh	90.0	105	2.4	2.67	56 5	56.0	100	180	140	94.4	2.3	55.4	49.3	87	90 4	26	33 5
Bhutan	1.2	0.60	1.8	2 15	43	47.9	80	180	-	125.0	4 1	1.2	.343	1.2	.25	22	23 4
India	672.0	844.32	2 1	2.03	52	58.6	190	340	129	80	1.7	395	445.62	629.2	726.22	34 5	51 64
Indonesia	147.0	179	2.3	1.9	53	60.2	380	500	108 5	58	0.9	112	102 0	113.0	118 3	57.7	81.1
DPR Korea	17.91	21.77	1.8	1.5	-	69.8	-	970	11.4	-	1.5	-	-	-	-	100	100
Maldives	0 161	0.22	2.8	3.4	42	64.0	200	420	120.6	43	2.0	.153	.115	138	167	81.9	95 4
Mongolia	1.67	2 09	2.9	2.77	64	61.3	-	780	60.0	60 9	3 4	-	.42	-	.54	100	100
Myanmar	32 0	39.9	2 3	2 1	58	60.0	160	220	80.0	44 3	1.3	25	26 7	25 0	25.4	60	78.7
Nepal	13.86	18 9	2 2	2 5	47.5	54.0	130	180	146.5	105.3	3.3	12.29	11 9	13.57	17.8	24.3	35
Sri Lanka	14 6	17.7	1.7	1.3	68	70.3	230	430	37.1	19.4	0 6	6 6	5 5	8.0	4 9	80	87 2
Thailand	47.0	56 4	2 4	1.53	59.3	64.6	590	970	48.6	35	1.5	16.9	9 2	24.9	12 4	70	87 6

[1] Bulletin of Regional Health Information (1981)
[2] Bulletin of Regional Health Information (1991)

Table 2: URBAN WATER SUPPLY COVERAGE
(Population in millions)

COUNTRY	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop	Cov.
Bangladesh	5	0.02	7	2.0	10	2.6	18	4.3	25	9 3	30	14.4	35	19 6
Bhutan	-	-	-	-	-	-	-	-	0.06	0 037	0.065	0.057	0 070	0 070
India	109	66 3	128	107	148	115	174	127	217.18	183.2	258.3	239 5	306.9	295 2
Indonesia	37	4	43	10	50	17	59	25.7	55	36	39 5	35.55	54.3	51 59
Maldives	0.012	0.0	0.014	0.0	0.038	0.004	0.05	0.03	0.06	0 053	0.07	0.07	0 08	0 08
Mongolia	-	-	-	-	-	-	-	-	1.08	1 08	1.3	1.3	1 5	1 5
Myanmar	6	2	7	3	8	3	9	3 2	9.9	4 2	10 62	5 54	11 85	11 85
Nepal	0.4	0.21	0.53	0.45	0.86	0 71	1.35	1 0	1.8	1.2	2.5	2 06	2.92	2 92
Sri Lanka	3.0	1.3	3.0	1.2	3	1.5	3.4	2.8	3.7	3 2	3 85	3.6	4	4
Thailand	5	3	7	4	11	7.1	12 9	7	15.7	11 8	18 1	15.7	20 4	20 4
REGIONAL	**165.41**	**76.83**	**195.54**	**127.65**	**230.90**	**146.91**	**277.5**	**170.23**	**329.48**	**250.07**	**364.305**	**317.777**	**437.02**	**407.21**

t. = Total Population
/. = Population covered

Table 3: RURAL WATER SUPPLY COVERAGE
(Population in millions)

COUNTRY	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Bangladesh	60	13	67	17	80	32	82	40	80	54.4	92	68	102	81.6
Bhutan	-	-	-	-	-	-	-	-	0.54	0.22	0.583	0.35	0.626	0.626
India	438	25	487	86	524	162	558	314	627.14	465.5	666.9	639.9	699.3	699.3
Indonesia	84	1	91	5	97	18	106	38	124	41	157.8	102.57	162.9	130.32
Maldives	0.097	0.0	0.106	0.0	0.123	0.004	0.14	0.02	0.161	0.052	0.18	0.08	0.20	0.20
Mongolia	-	-	-	-	-	-	-	-	1.01	0.59	1.2	1.0	1.4	1.4
Myanmar	22	3	24	3	26	4	28	6.8	31	9	33.65	17.54	37.58	35.93
Nepal	11	0.01	12	0.54	13	0.862	15.3	3.8	17.1	5.8	18.6	13.08	20.37	20.37
Sri Lanka	10	1.4	10	1.4	11.6	6.5	12.6	7.6	14	9	14.5	12	15.1	15.1
Thailand	31	6	36	11	36	23	39	26	40.7	35.4	42	39.9	43.3	43.3
REGIONAL	**656.10**	**49.41**	**727.11**	**123.94**	**787.72**	**246.37**	**841.04**	**436.22**	**935.65**	**620.96**	**1027.28**	**894.42**	**1082.78**	**1028.15**

= Total Population
= Population covered

Table 4: URBAN SANITATION COVERAGE
(Population in millions)

COUNTRY	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov
Bangladesh	5	0.02	7	1.0	10	2	18	4.4	25	9 8	30	15.4	35	21
Bhutan	-	-	-	-	-	-	-	-	0.06	0.030	0.065	0.055	0.070	0.070
ndia	109	30	128	35.5	148	40	174	49.6	217.18	102.2	258.3	171	306.9	239 8
ndonesia	37	-	43	6	50	14	59	19	55	23.2	39 5	31.6	54 3	48 87
Maldives	0.012	0.0	0.014	0.0	0.038	0.022	0.05	0.027	0.06	0.05	0.07	0.07	0.08	0 08
Mongolia	-	-	-	-	-	-	-	-	1.08	1.08	1.3	1.3	1.5	1 5
Myanmar	6	2	7	3	8	3	9	2.9	9.9	3 9	10 62	5 69	11.85	11.85
Nepal	0.4	0.06	0.53	0.07	0.86	0.14	1.35	0.23	1.8	0.6	2.5	1.47	2.92	2.34
ri Lanka	3,0	1.3	3.0	2.5	3	2	3.4	2.2	3.7	3	3.85	3 5	4	4
hailand	5	3	7	4	11	7.1	12.9	10	15.7	15.1	18.1	17.7	20.4	20.4
REGIONAL	**165.41**	**36.38**	**195.54**	**52.07**	**230.90**	**68.26**	**277.5**	**88.36**	**329.48**	**158.96**	**364.31**	**247.79**	**437.02**	**349.91**

= Total Population
= Population covered

Table 5: RURAL SANITATION COVERAGE
(Population in millions)

COUNTRY	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Bangladesh	60	0.1	67	0.3	80	1	82	2.5	80	4.8	92	43.2	102	81 6
Bhutan	-	-	-	-	-	-	-	-	0.54	0.32	0.583	0.513	0.626	0.626
India	438	0.5	487	1.7	524	2.8	558	4.03	627.14	15.9	666.9	30.8	699.3	457
Indonesia	84	4	91	6	97	20	106	40	124	37	157.8	94.68	162.9	122.18
Maldives	0.097	0.0	0.106	0.0	0.123	0.001	0.14	0.002	0.161	0.003	0.18	0.004	0.20	0.008
Mongolia	-	-	-	-	-	-	-	-	1.01	0.47	1.2	0.9	1.4	1.4
Myanmar	22	3	24	3	26	4	28	5.8	31	10.6	33.65	16.90	37.58	35 93
Nepal	11	-	12	-	13	0.15	15.3	0.26	17.1	0.5	18.6	3.3	20 37	6.11
Sri Lanka	10	6.6	10	5.8	11.6	4.6	12.6	7.1	14	9.8	14.5	12.4	15.1	15.1
Thailand	31	10	36	13	36	15	39	18	40.7	28.9	42	35.7	43.3	43.3
REGIONAL	656.10	24.2	727.11	29.8	787.72	47.55	841.04	77.71	935.65	108.29	1027.28	238.40	1082.78	763.25

= Total Population
= Population covered

Table 6: RANKING AND FREQUENCY OF CONSTRAINTS[1]

Constraints	Number of countries indicating constraint			
	Very Severe	Severe	Moderate	Ranking Index [2]
Funding limitations	4	4	1	21
Operation and maintenance	3	5	1	20
Insufficiency of trained personnel (professional)	2	4	2	16
Insufficiency of trained personnel (sub-professional)	2	4	2	16
Inadequate cost-recovery framework	1	5	3	16
Logistics	-	5	4	14
Insufficient knowledge of water resources	-	3	6	12
Lack of planning and design criteria	-	2	7	11
Inadequate water resources	1	1	5	10
Inappropriate institutional framework	-	1	8	10
Non-involvement of communities	1	2	3	10
Intermittent water service	1	2	3	10
Lack of definite government policy for sector	-	2	5	9
Insufficient health education efforts	-	3	3	9
Inadequate or outmoded legal framework	-	1	7	9
Import restrictions	-	1	7	9
Inappropriate technology	-	1	7	9
Lack of information system (Myanmar)	-	1	-	

[1] Number of reporting countries 10

[2] Ranking index = 3 x (No. very severe) + 2 x (No. severe) + (No. moderate)

Table 7: STAFF RESOURCES 1990 (top line) AND PROJECTED REQUIREMENTS FOR 2000 (bottom line)

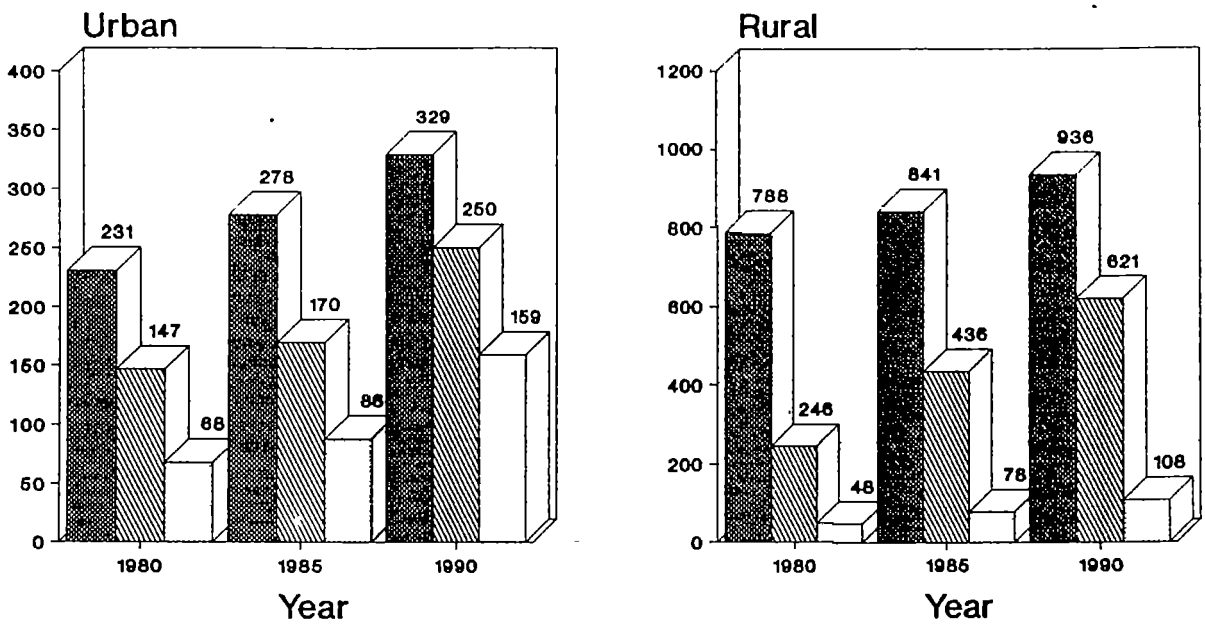
Country	Planning and management	Technical	Craftsmen artisanal	Administration clerical	Unskilled workers	Total per million population	Community-based workers (Yes/No)	HRD master plan (Yes/No)	Established training budget and is it sufficient (Yes/No)
Bangladesh	15 15	856 878	1,450 1,800	940 1,020	3,000 4,500	56 55	Yes	Yes	Yes/No
Bhutan	7 10	92 200	187 562	0 0	0 0	208 561	Yes	Yes	Yes/No
Indonesia	2,716 3,146	9,135 10,851	3,450 5,012	5,418 6,146	3,831 4,681	134 163	Yes	Yes	Yes/No
Maldives	10 16	15 30	14 60	23 38	7 19	324 -	Yes	Yes	Yes/No
Myanmar	45 52	771 1,066	2,089 3,126	441 539	581 701	96 111	Yes	No	Yes/No
Mongolia	- -	- -	- -	- -	- -	- -	Yes	Yes	Yes/No
Nepal	11 15	3,077 5,965	- -	1,470 2,130	2,467 2,875	371 540	Yes	Yes	Yes/No
Sri Lanka	210 235	715 800	2,060 2,200	840 900	3,226 3,200	401 353	Yes	Yes	Yes/No
Thailand	4 13	26 50	9 20	18 27	17 30	- -	No	Yes	Yes/No

e: The International Drinking Water Supply and Sanitation Decade End of Decade Review (as at 31 December 1990), WHO/CWS/92.12

Figure 1

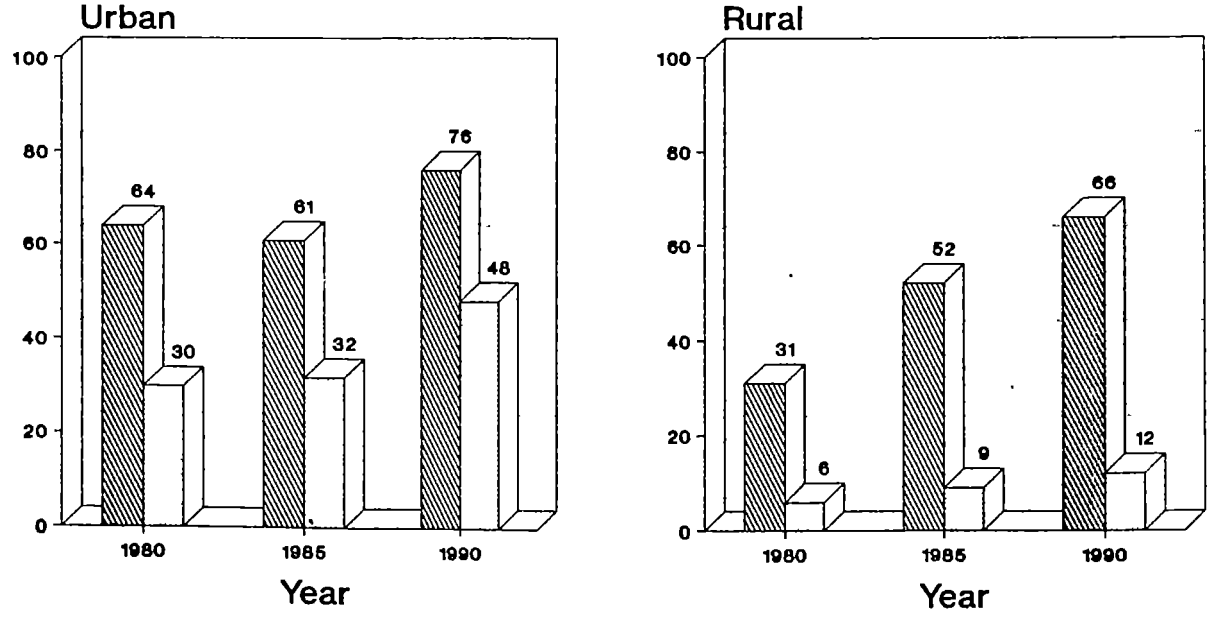
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

% of Population



SOUTH-EAST ASIA REGION

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS

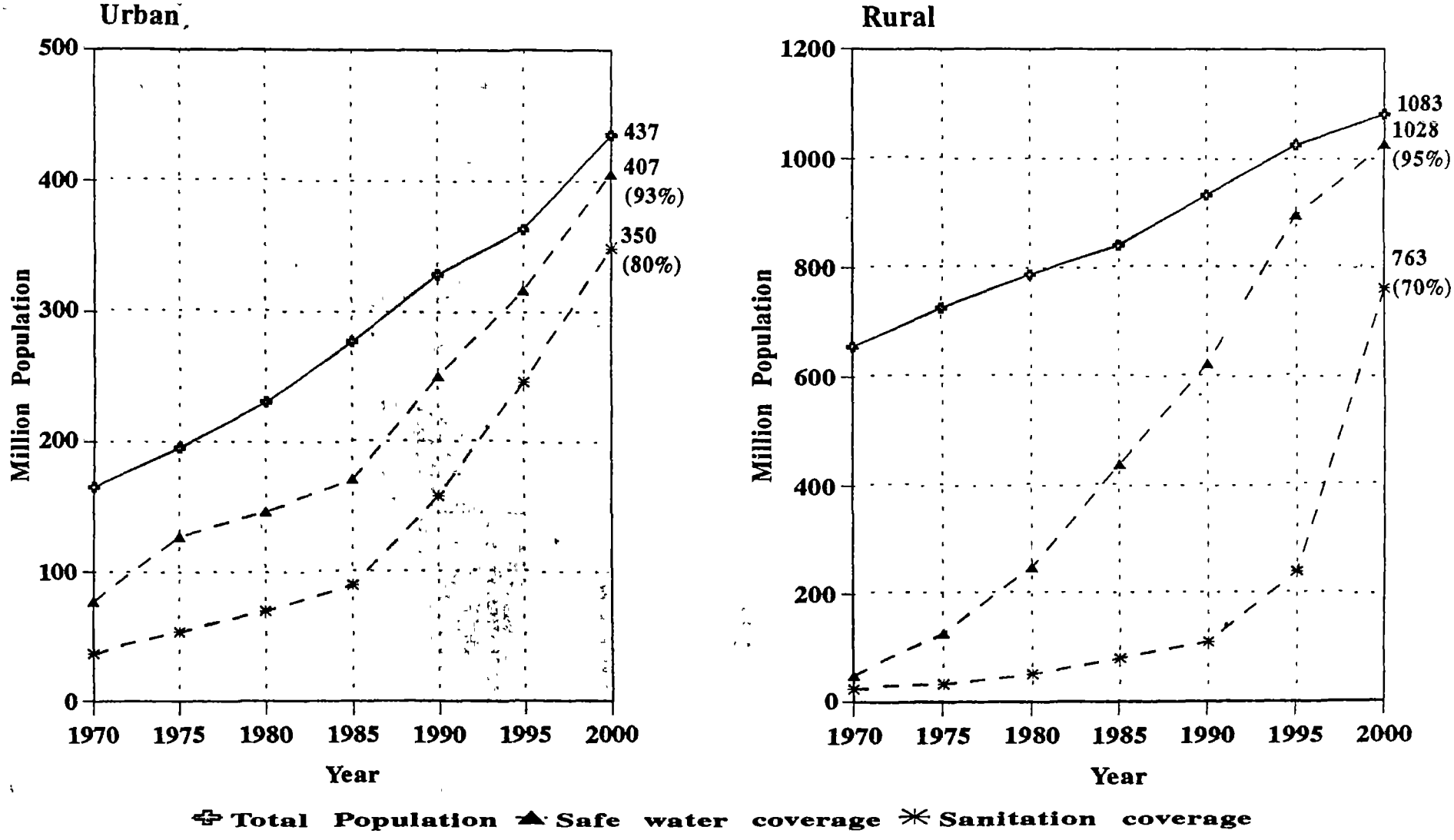
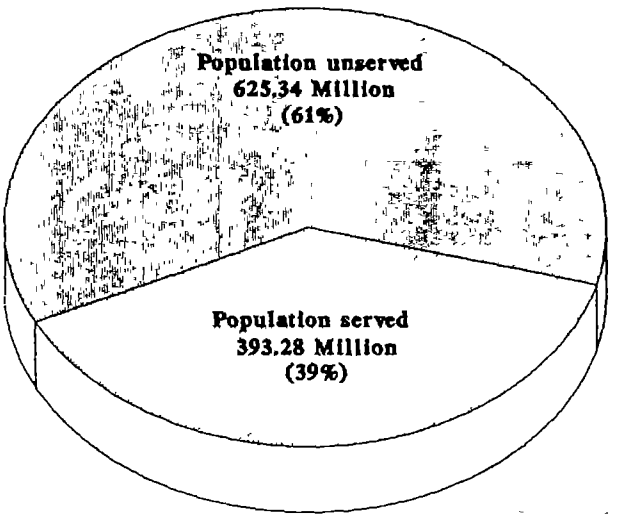


Figure 3

OVERALL REGIONAL SITUATION, 1980-1990

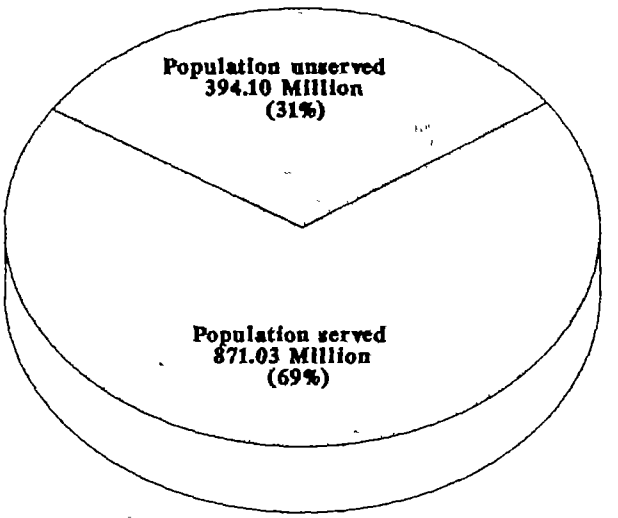
WATER SUPPLY

Total Population (Urban & Rural)
1018.62 Million



1980

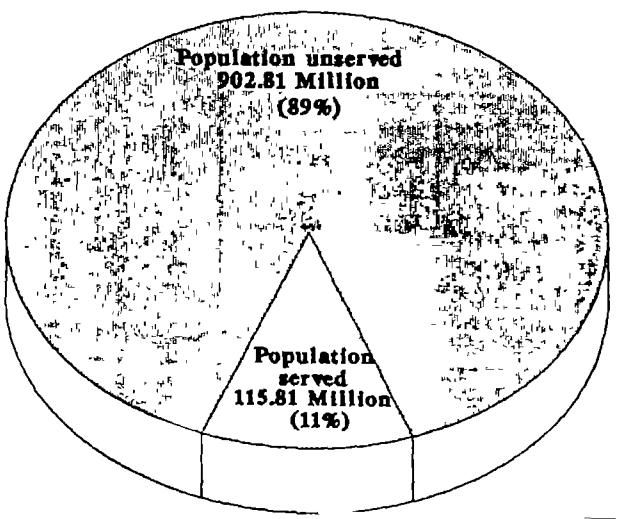
Total Population (Urban & Rural)
1265.13 Million



1990

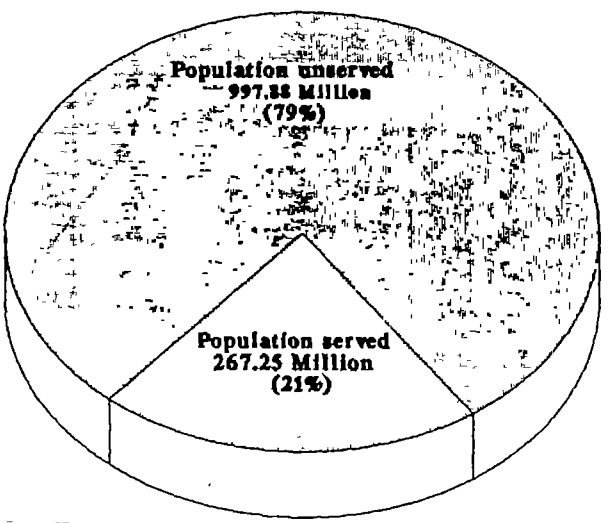
SANITATION

Total Population (Urban & Rural)
1018.62 Million



1980

Total Population (Urban & Rural)
1265.13 Million



1990

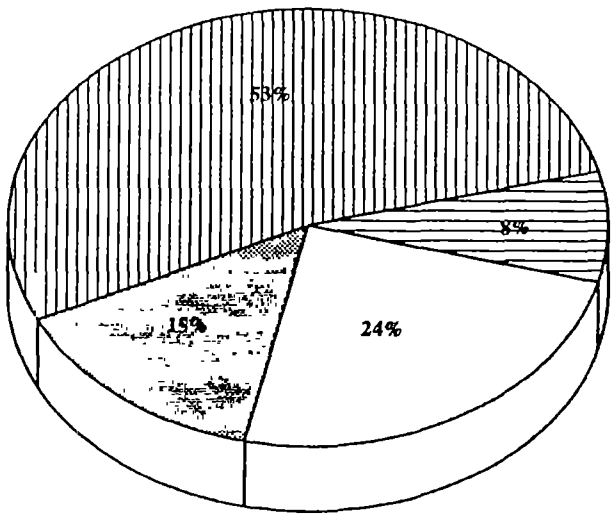
6AMULT

Figure 4

REGIONAL SITUATION - URBAN & RURAL, 1980-1990

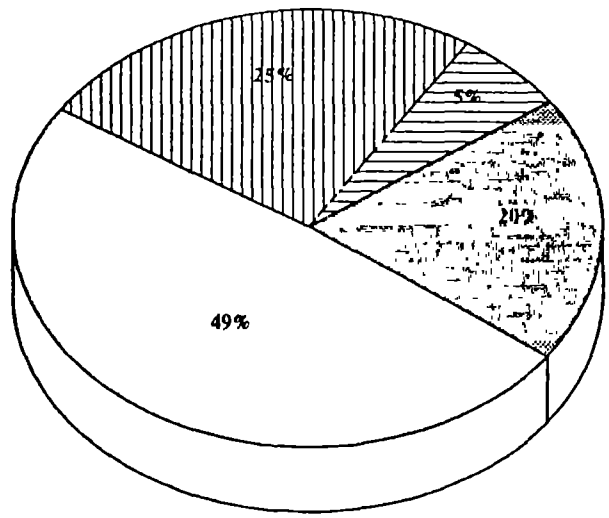
WATER SUPPLY

Total Population
Urban : 230.90 Million
Rural : 787.72 Million



1980

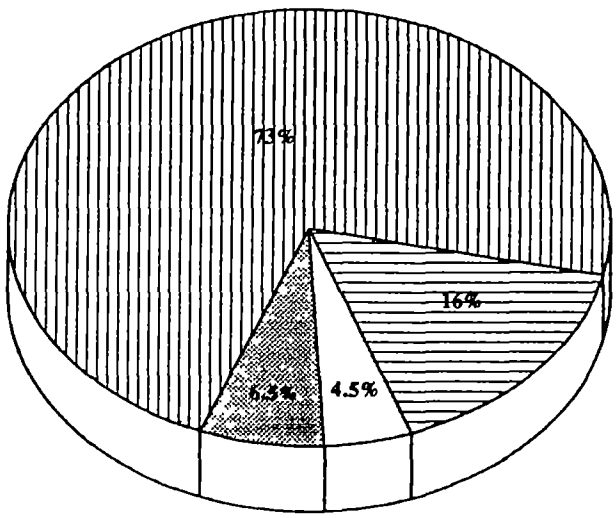
Total Population
Urban : 329.48 Million
Rural : 935.65 Million



1990

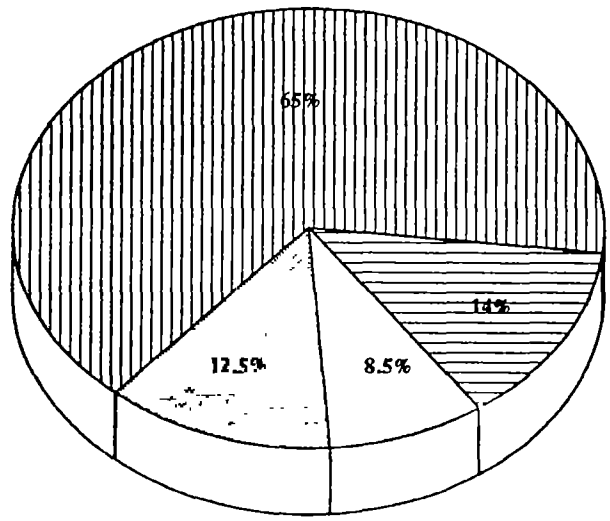
SANITATION

Total Population
Urban : 230.90 Million
Rural : 787.72 Million



1980

Total Population
Urban : 329.48 Million
Rural : 935.65 Million



1990

Urban Unserved Urban Served Rural Unserved Rural Served

PART - II

COUNTRIES

1. BANGLADESH

1.1 DECADE STATUS

The Local Government Division in the Ministry of Local Government, Rural Development and Cooperatives has administrative control over the sector through its different agencies. The Department of Public Health Engineering is the principal agency responsible for the planning and implementation of water supply and sanitation except in the cities of Dhaka and Chittagong, which have Water Supply and Sewerage Authorities.

A National Action Committee (NAC) was established in 1979 with responsibility for implementing activities of the International Drinking Water Supply and Sanitation Decade (IDWSSD), and a comprehensive Decade Plan proposing service coverage targets was prepared. Table 1 shows the coverage of population achieved and targets for the future. Table 2 shows the projected population and acceleration required to meet the targets. Figure 1 & 2 provide graphical presentation of coverages and targets.

The service coverage target set for the Decade for rural water supply was 77 per cent. In fact, by the end of the Decade, the estimated coverage was 68 per cent, indicating a shortfall. Different technologies were used to supply rural communities dependent on ground water conditions. The population was served with the Bangladesh No.6 shallow well handpump, with the deep-set Tara handpump, and with deep tubewells.

Rural sanitation was less well implemented with only 6 per cent of the population considered to have access to water-sealed latrines by 1990. The programme started late and about 900,000 water-sealed type latrines were installed whereas 1.9 million would have been needed even to meet the limited Decade target of 13 per cent. The health education programme is being intensified and, with an increased number of centres producing latrine slabs and improved acceptance in the communities, greater progress is expected in the future.

At the start of the Decade, service coverage in urban water supply was 26 per cent, and at the end 37 per cent, although the target was 58 per cent. Of this, house connections amount to 20 per cent, public standposts 4 per cent and handpump tubewells 13 per cent. In the principal cities of Dhaka and Chittagong, where parts of the supply systems are old, wastage is high. In the other 63 towns having piped water, supply is intermittent averaging 6 to 8 hours per day.

Urban sanitation coverage reached 39 per cent by the end of the Decade compared to a proposed 50 per cent. Only Dhaka has a complete sewerage system and sewage treatment plant, and these require rehabilitation. Otherwise septic tanks and on-site latrine systems are used. Urban sanitation improvement needs considerable attention.

National investment in water supply and sanitation has been small in comparison to overall government expenditure. In the Second Five-Year Plan (1980-1985), it amounted to 2.1 per cent of the total public sector allocations, but in the Third Plan (1985-1990) it was only 1.2

to about US$ 170 million of which US$ 97 million was from external sources. About 93 per cent of this amount was allocated to water supply and only 7 per cent was spent on sanitation improvements. Drought/flood/cyclone and other natural calamities moved the Government to pay more attention to the environment, and recently, the Environmental Pollution Control Board has been upgraded to become the Department of Environment of the new Ministry of Environment and Forests with a mandate to take action against environmental threats and degradation.

1.2 TARGETS FOR THE YEAR 2000

The Bangladesh Government is committed to the achievement of the goal of Health For All by the year 2000 and in line with it set up the following targets for water supply and sanitation in 2000:

Urban Water Supply	56%
Urban Sanitation	60%
Rural Water Supply	80%
Rural Sanitation	80%

To attain these targets, coverage needs to be accelerated as shown in Table 2. The unserved or underserved population in the following areas will receive attention in the 1990s:

- urban slums and fringes
- areas of dropping groundwater table
- areas of coastal salinity
- underserved areas

The activities in the water supply sector will focus also on the problem which has resulted in unequal provision of services in the past.

1.3 AREAS OF ACTION IN THE 1990s

In order to pursue the objective of supplying as many people as possible with safe drinking water and adequate excreta disposal facilities by the year 2000, the following areas of action have been identified to overcome the related constraints/issues.

1) Sector review and comprehensive sector development plan

In the absence of allocation of high priority backed by adequate resources and a compehensive sectoral development plan, decade activities were carried out in a piecemeal fashion. The decade experience therefore clearly shows a need for the Government to accord the sector its appropriate priority and resources to meet the public demand for improved equitable service and realize the established targets.

The comprehensive sector development master plan for water supply and sanitation is long overdue and, when ready would provide a sound basis for detailed

sectoral planning to address the needs of the population, eliminating the disparity and addressing manpower and institutional needs in the 1990s.

2) **Institutional development**

Owing to inadequate structuring of the sector, the sectoral activities continue to be implemented vertically with very little involvement of the beneficiaries. The sectoral agencies will realign and strengthen the institutional structure and transfer responsibility to lower-level institutions gradually and play the role of facilitators for community-based service instead of direct service providers.

3) **Human resources development**

Additional training institutions shall be established to update existing staff of central government and local government institutions and to train village caretakers to undertake simple operation and maintenance activities and to train semi-skilled people (private entrepreneurs) engaged in this sector for technology transfer/promotion/ development. Linkages need to be strengthened with existing training institutions and government agencies to constantly update the knowledge of their staff according to the technological and approach changes in the sector.

4) **Operation and maintenance**

Efforts will be made to enable all municipalities (Pourashavas) to meet their responsibilities for operation and maintenance of their piped water supply systems. This would be a step towards remedying the high loss of revenue through unaccounted for water, estimated at 40 per cent, and improving cost recovery so as to free funds for augmentation, extensions and for construction of new systems. Community participation and involvement of women in rural water supply operation and maintenance will be intensified.

5) **Promotion of hygiene & sanitation**

Improved sanitation measures will be introduced in more communities to complement the service coverage in water supply, integrating promotional and health education efforts in coverage programmes. Appropriate low-cost sanitation alternatives should be developed and encouraged, particularly in areas of urban fringes and slums.

6) **Water quality surveillance**

Support will be provided to Water Supply and Sanitation Authorities (WASA) and regional laboratories so that a better system of surveillance of water quality can be established, including monitoring, reporting and implementation of remedial measures.

7) **Integration of drainage and solid wastes management**

Measures will be undertaken to improve urban drainage and solid wastes management and integrate it into sanitation programmes so that pollution of surface and

ground water, flooding and disease vectors can be controlled. Demonstration schemes, surveys of communities requiring improvement, and the development of appropriate technological options to suit the local conditions and involving the private sector and local authorities are necessary.

8) Local production

Efforts will be made to encourage the development of local capacity to produce, within the country, the hardware required for water supply and sanitation improvements, such as pipes, pumps, slabs and tanks using, as far as possible, locally-available materials and thus avoiding the high cost of importation.

9) Community participation

Greater promotional efforts will be made to involve the community, particularly women, in all stages of project development from planning, design to implementation and operation, to ensure the sustainability and expansion of self-help implementation.

10) Resources mobilization

Efforts will be made to increase the level of national investment during the 90s. At the same time, more attention will be paid to cost recovery and preparation of schemes that are self-financing and self-sustaining.

11) Intersectoral partnerships

There is a need to improve cooperation between national agencies representing diverse sectors for improvement in the health status of the population. Social mobilization for sanitation launched successfully in Bangladesh is an example of such multi-sectoral as well as multi-agency cooperation which is the only way of achieving improvement in sanitation conditions.

Cooperation between ESAs and NGOs modelled on this approach is necessary if the established targets are to be achieved.

1.4 FOCUS OF WHO SUPPORT

The Organization will strive to promote active cooperation among national agencies and collaboration with ESAs in sector development. WHO support in the 1990s will centre on the promotion of sector activities with emphasis on community participation, including strengthening the role of women in the development process and involvement of NGOs. More specifically, WHO support in the 1990s will include cooperation in

- The preparation of a sector development plan for the 1990s.
- Strengthening of institutional capability by software inputs to the proposed training institute and related training programmes.

- Development of national sector information systems.
- Development of water quality surveillance and operation and maintenance systems.
- Development of hygiene education and sanitation promotion.
- HRD activities at macro and micro levels.

Table 1 : WATER SUPPLY & SANITATION

COVERAGES & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.*	Cov.	Pop.	Cov.**	Pop.	Cov.
Urban Water Supply	5	0.02	7	2.0	10	2.6	18	4.3	25	9.3	30	14.4	35	19.6
Urban Sanitation	5	0.02	7	1.0	10	2	18	4.4	25	9.8	30	15.4	35	21.0
Rural Water Supply	60	13	67	17	80	32	82	40	80	54.4	92	68.0	102	81.6
Rural Sanitation	60	0.1	67	0.3	80	1	82	2.5	80	4.8	92	43.2	102	81.6

* = Data based on 1991 census
** = Interpolated between 1990 and 2000 figures
Pop. = Total Population
Cov. = Population covered or targeted

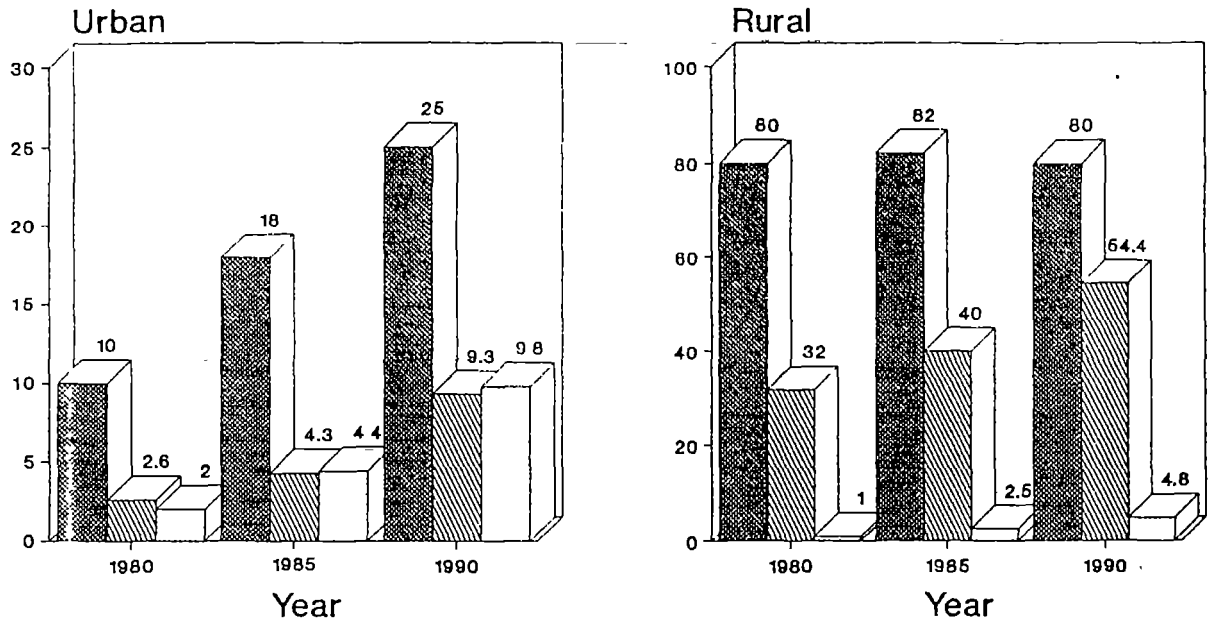
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	9.3	7.0	35.0	16.3	47	19.6	56	10.3	1 47
Urban Sanitation	9.8	8.0	35.0	17.8	51	21.0	60	11.2	1.38
Rural Water Supply	54.4	35.4	102.0	89.8	88	81.6	80	27.2	0.77
Rural Sanitation	4.8	4.3	102.0	9.1	8.9	81.6	80	76.8	17.8

Figure 1

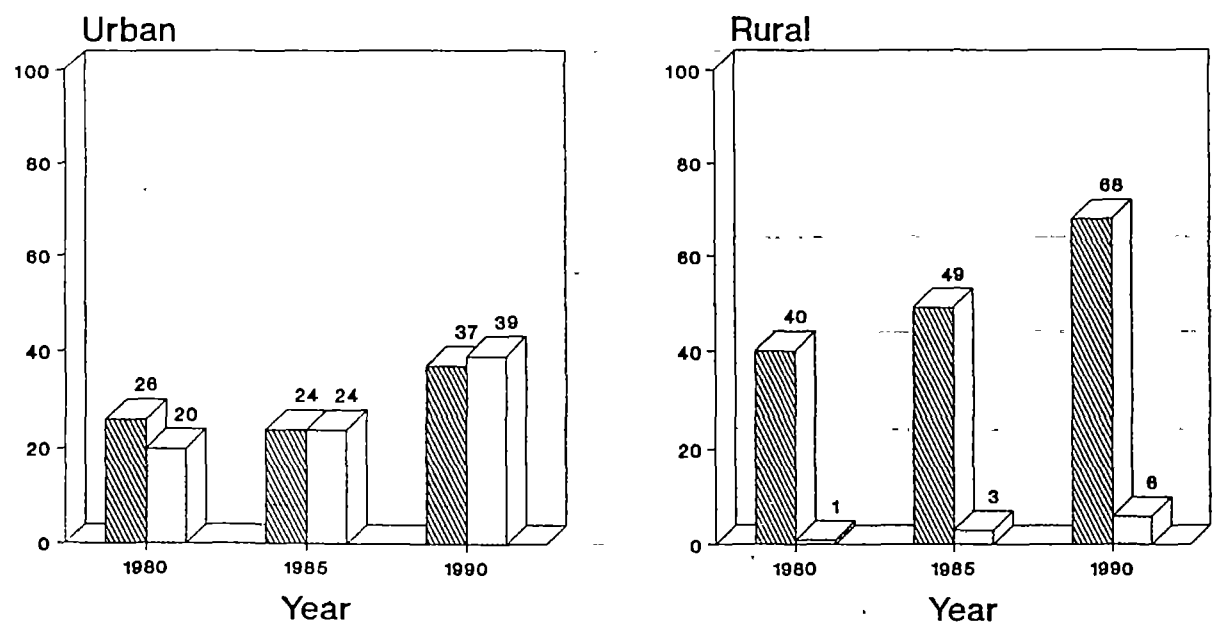
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

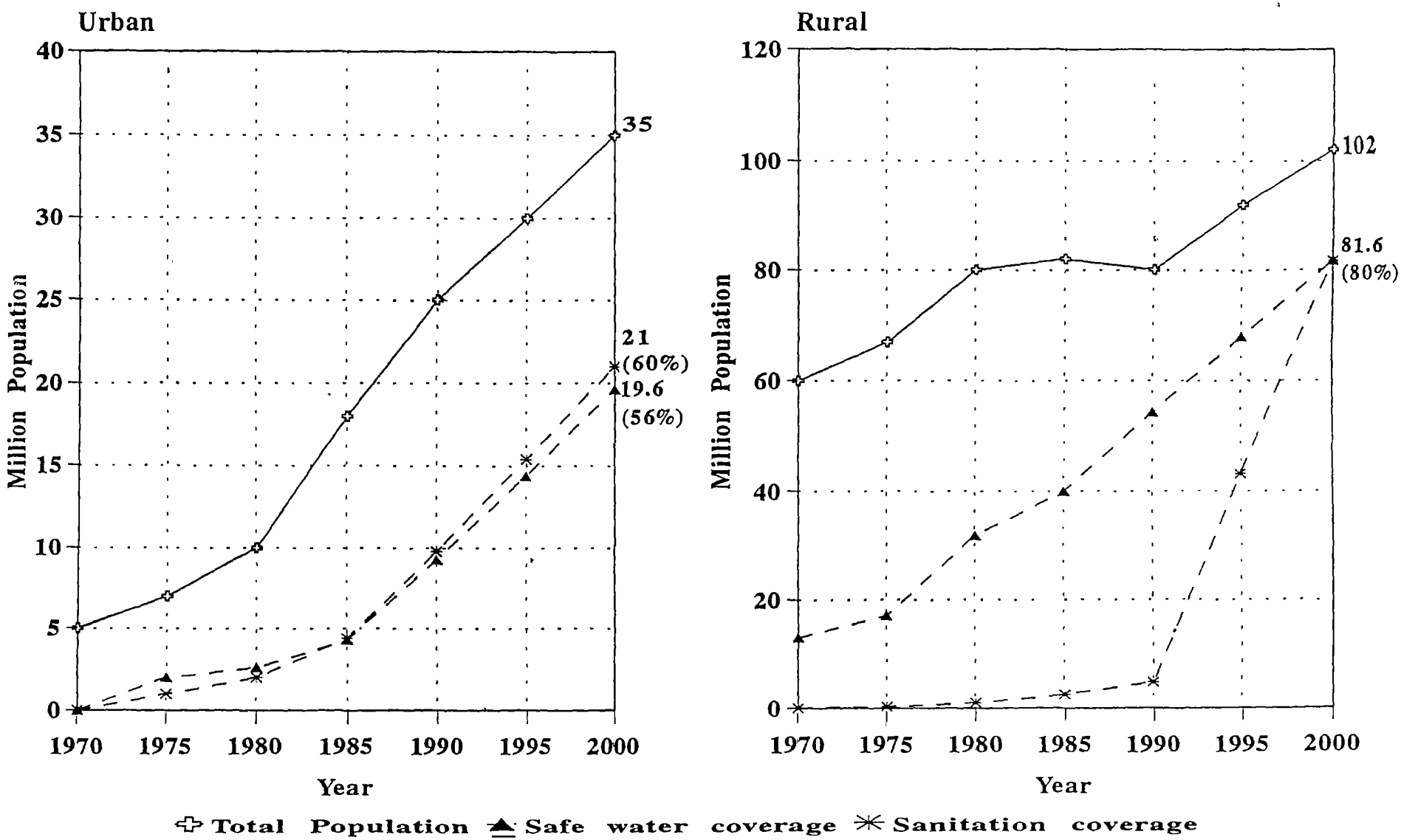
% of Population



BANGLADESH

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



2. BHUTAN

2.1 DECADE ACHIEVEMENTS

The Decade provided an appropriate opportunity not only for the improvement of water supply and sanitation, but also for Bhutan's overall social and economic development, based on the infrastructure established during the previous two decades when priority had been given to the construction of transportation links and agriculture. With UNICEF assistance, nearly 1 000 rural water supply schemes, based on simple gravity feed, were provided to serve about 290 000 population, bringing service coverage to about 40 per cent. Concurrently, the Asian Development Bank supported the improvement and augmentation of water supply to six urban communities so that, together with the 25 urban communities and 20 urban centres where gravity feed systems supply water to some of the population, about 61.6 per cent of the urban population was served with piped drinking water facilities by the end of the Decade.

With regard to sanitation, less has been achieved. No sewerage system yet exists, and urban centres rely on septic tanks, soak-away pits and other on-site latrines for excreta disposal. At the end of the Decade, these were estimated to serve 50 per cent of the urban population. In rural areas, funds from UNDP were used to construct 1600 low-cost sanitary latrines in schools, health centres, dispensaries and selected houses in a demonstration project which successfully created a demand for more facilities. While this input provided services to about 3 per cent of the rural population or some 35 000 population, the service coverage at the end of the Decade was estimated at 60 per cent. Table 1 provides information on the present coverage and targets for the future.

During the Decade, the Works and Housing Department within the Ministry of Social Services was formed to consolidate and rationalize activities previously under the responsibility of the National Urban Development Corporation, the Public Health Engineering Cell and other agencies. This has enabled optimal use to be made of available technical and administrative resources and the scarce trained manpower in the sector. Very high priority was assigned to human resources development through training courses.

Using the existing infrastructure of the Departments of Health Services and of Education, training in community health was given to some 450 national instructors, school teachers, basic health workers, health assistants, district engineers and section officers, as well as to nearly 800 village leaders and volunteers. Decision-making has been decentralized so as to involve the communities in the formulation, implementation, operation and maintenance of the programme.

The Department of Health Services has the responsibility for water quality surveillance with financial support provided by the Department of Works and Housing. During the Decade, ten of the 18 districts were supplied with chemical and

bacteriological water-testing equipment and the public health laboratory of Thimphu Hospital was renovated and equipped to conduct water quality analysis.

2.2 TARGETS FOR THE YEAR 2000

In line with the Health for All by the year 2000 initiative, the country has set up a very ambitious target of near universal coverage by drinking water and sanitation in the year 2002. The Government will implement most of the programmes in cooperation with UNICEF and set the targets for 1997 (the end of the Seventh Five-Year Development Plan) as follows:

1	Universal access to safe drinking water	60% (improved)
2	Universal access to sanitary means of excreta disposal	100% access to latrine (not necessarily sanitary)

2.3 AREAS OF ACTION IN THE 1990s

In order to attain the national goal of providing full service coverage by protected water supply and adequate sanitation in line with the Government's commitment to the global goal of Health for All by the Year 2000, the following areas of action will be implemented to overcome the related constraints/issues.

(1) Institutional Development

Water supply and sanitation is at present a part of public works. A separate department for water supply and sanitation or at least a separate unit will be established. The unit will also be responsible for the management of water resources, solid and liquid, municipal and industrial wastes, protection of surface and ground water and water quality surveillance. At zonal and district levels, support staff will also be provided.

(2) Sectoral Planning

Priority will be given to carrying out a thorough study of the sector needs in manpower and financial resources, the social aspects, the requirements for research and development, and the possibility of subsidy payments, with a view to reaching the programme's objectives. External consultant services will be sought in order to assist the Government in preparing a national plan and policy document which would be endorsed by the National Assembly for implementation.

(3) Human Resources Development

The capacity of the Royal Bhutan Polytechnic, Deothang, will be improved and upgraded for the award of a Bachelor's degree in Civil Engineering covering aspects of

water supply and sanitation Curricula will be oriented to respond to the need of the sector for multi-disciplinary skills and to provide refresher courses for the in-service upgrading of technical staff. In the interim period, the shortage of trained personnel will have to be met by recruitment outside the country and existing staff will also be trained outside the country.

(4) Financial Resources

Increased internal financial allocations to the sector will have to be made and additional financial support from international and bilateral sources sought. Funds will be generated through the application of appropriate water tariffs in urban areas. Rural communities, which will be empowered to own and control their own systems, will be expected to bear the cost of at least the operation and maintenance of their drinking water supplies, including minor repairs.

(5) Appropriate Technology

The selection of technologies to be used, particularly those related to sanitation, will be based on studies of the socioeconomic and cultural factors dominant in the communities, consideration being given to affordability and sustainability. The required research and development will be promoted.

(6) Community Participation

The Operation and Maintenance Manual, which was prepared by the Department of Works and Housing and which outlines a clear strategy for community involvement in the operation and maintenance of systems, requires endorsement by the Government so that it may be effectively used. The capacity of the communities to manage installed systems will be supported through district engineering units and software coordinators. Steps will be taken to encourage NGOs to identify and mobilize community leaders who will assume the responsibility for programme implementation and system maintenance.

(7) Health Education

The school syllabus in primary and secondary schools will be revised to cover all aspects of health and hygiene education. Formal and informal health education campaigns will be conducted in schools and community centres. The proposed Department of Water Supply and Sanitation will have a software coordination unit headed by a social scientist or a health educator who will work in close collaboration with the Departments of Health Services and Education.

(8) Cooperation among Institutions

The National Commission on Water and Sanitation, which was established in 1982 for sector planning, policy formulation and coordination with other sectors, is to be revitalized and empowered to take responsibility for international and national coordination. Efforts will be pursued to establish a forum for discussion at the central

level between representatives of all sectors involved so that programme activities will benefit from inter-departmental coordination and cooperation.

(9) Private Sector

The Government will encourage the development of the capability of the private sector, initially through financial support on a soft loan basis, to increase the use of local materials and local production of equipment. The skills of villagers will be identified and developed to permit the communities to assume responsibility for operation and maintenance and minor repairs.

2.4 FOCUS OF WHO SUPPORT

WHO's technical support to the programme will complement UNICEF assistance in :

- sector development planning;
- training and manpower development;
- strengthening of water quality surveillance;
- setting of national standards for water quality;
- health education as a component of community water supply and sanitation, and
- development of appropriate technology.

3. INDIA

3.1 DECADE STATUS

Provision of safe drinking water supply and sanitation to the growing population in the world's second most populous country was a stupendous task in the Decade. India, as a signatory to the United Nations resolution on "International Drinking Water Supply and Sanitation Decade", had pledged its full support to the Action Plan under the Decade Programme in the country covering four years (1981-85) of the Sixth Plan (1980-85), five years of the Seventh Plan (1985-90) and one year of the Annual Plan (1990-91).

At the start of the Decade, the responsibility for coordination of the Decade activities at the national level rested with the erstwhile Ministry of Works & Housing (redesignated as Ministry of Urban Development in 1985). In order to give a boost to the rural water supply sector, the Government of India in September 1985 decided to transfer the subject from the erstwhile Ministry of Works and Housing to the Department of Rural Development in the Ministry of Agriculture and Cooperation, thereby integrating the Rural Water Supply and Sanitation Programme with other rural development and employment programmes. The Department of Rural Development was redesignated as Ministry of Rural Development in 1991. In 1986, a further impetus was given to rural water supply with the launching of the National Drinking Water Mission with the objective of coverage of the whole country by 1990 with Safe Drinking Water Supply in rural areas. Meantime in 1987, the National Water Policy was announced which gives priority to drinking water supply. The following were the objectives of the Water Mission:

(a) To cover all residual problem villages;

(b) To supply 40 lpcd in all areas for human beings and an additional 30 lpcd in desert areas for cattle;

(c) To evolve a cost effective technology mix to achieve objectives within the limits of planned allocation;

(d) To take conservation measures for sustained supply of water;

(e) To improve peformance and cost effectiveness of on-going projects and

(f) To create awareness on use of safe drinking water.

During the Decade, considerable efforts have been made in India towards providing safe drinking water and sanitation to its people. Rural Water Supply was provided under the State Sector Minimum Needs Programme (MNP) and the Centrally-sponsored Accelerated Rural Water Supply Programme (ARWSP). In 1986, the National Drinking Water Mission (NDWM) (redesignated as Rajiv Gandhi National

Drinking Water Mission - RGNDWM in 1991), popularly known as the Technology Mission, was launched to provide scientific and cost-effective content to the Centrally-sponsored Accelerated Rural Water Supply Programme (ARWSP). The Rural Sanitation Programme was taken up in January 1986, under the National Rural Employment Programme (NREP), the Rural Landless Employment Guarantee Programme (RLEGP), Indira Awaas Yojana and a number of other schemes in the States. In order to supplement the efforts of the State Governments, the Centrally-sponsored Rural Sanitation Programme (CRSP) was launched in October 1986. The Rural Sanitation Programme was included under the Minimum Needs Programme (MNP) in 1987-88. The Rural Water Supply and Sanitation Programmes are two important elements in the Government of India's 20-Point Programme for socioeconomic development. In the later half of the National Seventh Five Year Plan (1985-90), UNICEF also came forward to support the government's efforts in the provision of rural sanitation in eight States of India. While the Urban Water Supply and Sanitation Programmes are implemented under the State Plans, a Centrally-sponsored Low-cost Sanitation Programme was launched in 1990-91 for the conversion of dry latrines into low-cost sanitary latrines in urban areas with the aim of liberating and rehabilitating all scavengers by the end of the Eighth Five Year Plan (1992-97).

The Government of India had, in February 1985, set up the Central Ganga Authority to oversee the implementation of the Ganga Action Plan in view of the magnitude of pollution of the river Ganga. The objective of the Ganga Action Plan is to intercept, divert and treat the sewage flowing into the river with a view to improving the water quality and controlling the industries discharging their effluent into the river to conform to prescribed standards. Schemes of low-cost sanitation, riverfront development and the construction of electric crematoria are part of the Action Plan. Two hundred-and-sixty-one schemes spread over Uttar Pradesh, Bihar and West Bengal have been started during the Seventh Plan (1985-90) period at a cost of Rs.2560 million. As many as 147 schemes were completed during the Seventh Plan. An independent evaluation of the Ganga Action Plan - Phase I is being taken up by the Ministry of Environment and Forests. A Monitoring Committee of the Ganga Action Plan under the chairmanship of a Member of the Planning Commission has been operational during the Seventh Five-Year Plan (1985-90).

Technology plays an important role in providing safe water and sanitation. Some technologies suitable for developed countries proved to be not suitable for India. Some of the technologies were simply too expensive - low cost systems as appropriate for developing countries are needed which can be built with local materials and skills and can be maintained by members of the community. India has its own problems and is striving to develop its own technology. Choosing the right technologies was important for making the present decade of the nineties a success. The technology for rural water supply and sanitation should be suitable for village-level operation and maintenance. Use of satellite imageries followed by ground truth surveys for source finding and development, the use of new drilling rigs and equipment for water prospecting, rainwater harvesting and appropriate measures to conserve water, leak detection and preventive maintenance through water quality surveillance, development of field level mobile (17) and stationary district-level water testing laboratories (for 120 districts), development of India Mark II/India Mark III hand pumps, development of low-cost water treatment

facilities, setting up of defluoridation, iron removal and desalination plants where these were required, efforts in the direction of recycling of liquid and solid wastes, etc., symbolize the success of the Decade in India.

Introduction of a computerized rig monitoring system, strengthening of MIS in the rural water supply and sanitation sector, training and development of human resources at different levels, involvement of the community, NGOs and local-level institutions in planning, implementation and O&M of rural water supply and sanitation schemes, were some of the remarkable achievements of the Water Decade in India. Funds of up to 10% of the annual investment for schemes for rural water supply were being earmarked and utilized for O&M and guidelines for this were prepared. Research on low-cost technologies was undertaken with conspicuous success in regard to hand-pump development.

India is poised to achieve 'zero' incidence of Guineaworm disease by 1993 and 'eradication' by 1995 - besides progressively finding solutions to other bacteriological and chemical problems like excess fluorides, salinity and iron in water sources as a part of the Rajiv Gandhi National Drinking Water Mission. To increase the momentum of the Sub-Mission activities under "Control of Fluorosis", international agencies like WHO, UNICEF and bilateral agencies are giving financial support.

The population in India has been increasing at a very rapid rate. It increased from 361.09 million in 1951 to 844.32 million in 1991 (as per the 1991 Census). It is projected to reach 941.37 million in 1997 (at the end of Eighth Five-Year Plan) and 1006.20 million by the year 2000. Rapid growth of population in rural and urban areas, growth of industry and services and the associated urbanization have brought in their wake environmental problems of major dimensions in the country, particularly in the cities, and have contributed to the ever-growing burden of providing basic amenities, viz., water supply and sanitation to the growing population in the Decade.

As on 31 March 1981, it was estimated that service coverage of the urban population was 72.3% in respect of water supply and 25.1% for sanitation out of the 1981 urban population of 159.81 million. The original targets for the Decade programme were 100% for urban water supply and 80% for urban sanitation. The mid-Decade review in 1985 decided that these targets should be lowered to 90% coverage in urban water supply and 50% for urban sanitation. The coverages achieved till the end of December 1990 by all the States and Union Territories have been assessed, according to which 83.8% and 46.76% of the urban population have been provided with water supply and sanitation facilities respectively. In terms of absolute population, respectively 185.38 million and 103.43 million have been provided with water supply and sanitation facilities out of the total estimated urban population of 221.189 million as on 31 December 1990. Coverages assessed by State are listed in Table 1[2].

[2]Source: Draft report by the national consultant

In respect of rural areas, the coverage levels in 1980 were estimated to be 31% for rural water supply and only 0.5% for rural sanitation. Although the targets of 100% for rural water supply and 25% for rural sanitation were set initially, the mid-Decade review in 1985 suggested revised Decade target levels of 85% for rural water supply and 5% for rural sanitation. However, the nodal Government Department for Rural Sector, i.e., Department of Rural Development (redesignated as the Ministry of Rural Development in 1991) could not accept the suggestion of the mid-Decade review in 1985 and decided to stick to the original Decade target of 100% (1981 census) for rural water supply and 25% for rural sanitation. In fact, the service coverage by March 1991 was 74 22% of the 1991 census population for rural water supplies, meaning that about 303.50 million population were supplied safe water during the Decade to bring the total covered to 465.50 million. Rural sanitation coverage through Government programmes was only 2.53% or 15.87 million. As per the 44th round of the NSS Survey (1988-1989), 10.96% of the rural population had access to sanitation facilities.

The assessed water supply and sanitation coverage at the beginning and at the end of the Decade in India is shown in Table-2. Table-3 shows the coverage of population achieved and targets for the future. Table-4 shows projected population coverages and acceleration required to meet the targets. Figures 1 & 2 provide graphical presentation of coverages and targets[2].

In rural areas, per capita water consumption used for project design was 40 litres per capita per day against which the estimated per capita water consumption would be in the rage of 25 to 30 litres per capita per day. Even this quantity is not equitably distributed. As regards urban areas, the coverage figures hide the fact that water services are unreliable in most areas. There are considerable inequalities in the per capita availability of water not only in cities, towns, notified areas, and urban agglomerations but also in different zones of such areas. Women, children, the poor and slum dwellers are particularly disadvantaged. The decade has taught the lesson that the per capita level of supply/hours of supply needs to be more rational and equitable.

The state of sanitation in India is very poor. Sanitation is one of the major indices of the quality of life. Rural sanitation could not make much headway in the Decade. About 611 million rural and 115 million urban people making a total of about 726 million out of 844.32 million (86%) remained unserved at the end of the Decade in so far as basic sanitation facilities are concerned. Though the situation as regards urban sanitation is relatively better (40% of the population in 50 Class I sample towns were reported to have been covered by sewerage systems in 1986-87 according to a sample survey by the National Institute of Urban Affairs), it is not difficult to gauge the conditions under which slum dwellers and the urban poor live. They do not have access to even the most basic amenities of life. The study carried out by NIUA in 1988 also revealed that in fifty Class-I cities, 61% of the sampled households used open spaces for personal sanitation, creating an unhygienic environment and a breeding ground for excreta-borne diseases, besides social problems. The study also revealed that 15% of the sampled households had private toilets and 21% used community toilets.

According to an estimate, 65 lakh dry latrines are yet to be converted into sanitary latrines in the country and six lakh scavengers are to be liberated from the

degrading practice of carrying nightsoil on head loads. These liberated scavengers and their dependants are to be rehabilitated after being imparted appropriate training. The task, therefore, is clear and permits no ambiguity as to where the country's focus should lie in the 1990s in so far as sanitation is concerned.

Emphasis was placed on human resources development to increase the number of engineers and technicians needed for the planning, implementation and O&M of the schemes provided during the Decade. Steps were taken to convert step-wells into sanitary wells in Guineaworm-affected areas, to convert dry latrines into low-cost sanitary latrines for the urban poor to eliminate the practice of manual nightsoil scavenging, and to rehabilitate the liberated scavengers. Through the action of the Water Pollution Control Boards, established since 1974 but strengthened by the Environmental (Protection) Act of 1986, and the Ganga Action Plan, measures have been taken to treat wastewater from many major towns and protect the environment.

In India, it has been estimated that only 29% of groundwater potential and 37% of surface water sources are exploited so far. It is expected that groundwater exploitation will go up to 40% by the year 2000 A.D. (see Table 5).

Compared to the utilizable water resources of 1140 km^3 which could increase considerably with inter-basin transfers, the demand in the year 2000 A.D. will be in the order of 750 km^3, which reveals that, in absolute terms, there will be no shortage of raw water in the country.

Mobilization of adequate financial resources for the implementation of the Decade Programme was a major constraint. A sum of Rs. 120.02 billion (US $ 9.38 billion) was approved for the Decade Programme in the country by the mobilization of resources from the Central and State Governments and External Supporting Agencies (ESAs). Against the above approved amount, utilization was 125.03 billion (US $ 9.76 billion), i.e. 104%. A sector-by-sector break-up of approved outlay and utilization in the water supply and sanitation Sector during the Decade (1981-1991) is shown in Table-6.

In the urban water supply and sanitation sector, the shortfall was 16%, whereas in the rural water supply and sanitation sector overall utilization was 21% more than the approved outlay. In the rural sanitation sector there was a shortfall of 24% in the utilization of the approved outlay.

Urban schemes received considerable loan assistance from national and international financial institutions such as L.I.C., HUDCO, the World Bank (IDA), UNDP, and ODA (U.K.), while WHO provided technical support and consultancy services, and modest resources of urban local bodies and grants-in-aid from the Central and State Governments were mobilized. For rural activities, mostly funds were mobilized as grants-in-aid from the Central and State Governments. For the rural sector, assistance from external support agencies such as bilateral agencies, the World Bank (IDA), UNDP, and UNICEF, was estimated at 5 to 6% of the investment.

Management Information System (MIS) for Water Supply and Sanitation

The management information system is one of the tools for effective management. The Government of India, Ministry of Urban Development, took up this programme in the Seventh Plan. WHO provided assistance to develop MIS software for six sub-systems in urban water supply and sanitation, such as planning, inventory control, personnel, operation and maintenance, finance and project monitoring. This software was tied to all State public health engineering departments and water supply and sewerage boards in the country for use in the collection and compilation of information on urban water supply and sanitation aspects. Senior and middle-level engineers were given training in the use of this software.

The Ministry of Urban Development provided financial assistance to the State Governments/Union Territories for the procurement of personal computers and accessories. With the help of UNDP, computer software was developed on "Improved Design Technique for Water Supply and Sewer Network using Microcomputer". Middle-level engineers were given intensive training in using this software to design water supply and sewer networks.

In order to ascertain the progress achieved in using the software on MIS by the user agencies, the Southern Regional meeting was conducted at Hyderabad on 14 October 1991. Following detailed discussions, the State agencies in charge of urban water supply and sanitation have been requested to furnish information on the "planning" sub-system of urban water supply and sanitation pertaining to Class-I cities of these States in the first instance.

For rural areas, the Department of Rural Development utilized the services of local consultants to develop software and implemented comprehensive rural water supply sector monitoring village by village for all problem and difficult villages.

3.2 TARGETS FOR THE YEAR 2000

India is committed to the further improvement of water supply and sanitation coverage. Based on the target coverage and population forecast, the following target coverages were established:

Urban Water Supply . . . . . 96% coverage
Urban Sanitation . . . . . 78% coverage
Rural Water Supply . . . . . 100% coverage
Rural Sanitation . . . . . 7% coverage

3.3 AREAS OF ACTION IN THE 1990s

Constraints

The following are the major constraints which still hamper progress in the expansion of service coverage in water supply and sanitation.

a) Urban

Very often ongoing projects, particularly externally aided projects mainly based on multilateral and bilateral assistance, are delayed on account of inadequacy of counterpart rupee funding and also because the projects are poorly planned. Owing to inadequate cost recovery and use of the development budget for returning loans, there is a need to examine in depth funding requirements vis-a-vis the resources position and committed liabilities before financing new projects on urban water supply and sanitation.

Inadequate cost recovery and pricing of water, implementation of billing and collection mechanisms for water tariffs, etc, are common problems. Wastage and leakage of water in pipe distribution systems is common because of poor maintenance.

As a result of the wide gap between the provision of proper disposal for wastewater and wastewater emanating from drinking water supplies and water used for other purposes in urban areas as well as inadequate sewerage and lack of waste treatment facilities, waste water stagnates or seeps into groundwater or finds its way to surface drain and surface water sources. Overuse and indiscriminate use of wastewater for irrigation and as a substitute for fertilizers to boost agricultural production is also increasing pollution levels of both ground and surface water.

Earlier efforts to discourage manual scavenging and liberate families engaged in this inhuman task have not borne satisfactory results. The ongoing programme for the conversion of dry latrines into low cost sanitary latrines and the liberation/rehabilitation of scavengers is not integrated or supported by penal legislation and adequate funding.

Insufficient technical manpower for the planning, implementation and O&M of urban water supply and sanitation schemes continues to be a problem in most local bodies which are responsible for managing the water supply and sanitation programmes in their areas.

b) **Rural**

Sanitation continues to be accorded low priority. The gap between the provision of drinking water supplies and sanitation facilities is very high. Sanitation coverage is poor because :

- Sanitation is not a felt need;
- Infrastructure is inadequate;
- There is a lack of coordination between different implementing agencies;
- There is insufficient sectoral planning;
- There are weak and inefficient institutional mechanisms;
- Of inadequately trained human resources;
- There are insufficient financial resources and no-cost recovery;
- There is lack of community participation and inadequate health education facilities; and
- There is a lack of private sector participation.

c) **Common for Urban and Rural**

- Operation and maintenance of water supply and sanitation installations in both rural and urban areas in the country is badly neglected. A huge backlog of systems needing rehabilitation is building up at a time when resources are scarce.
- The existing programmes are not cost-effective because of the use of inappropriate, innovative technology and non-integration with similar programmes.
- The needs of the backward and poorer classes of the population require greater attention.
- Emphasis is on coverage targets rather than on sustained utilization.

Areas of Action for the 1990s

Serving the Unserved and Underserved

The substantial improvement that has been made during the Decade could have been even better if additional financial resources had been made available. During the 1990s, the aim will be to reach (a) the unserved and (b) the underserved populations.

Four Guiding Principles

For sector development in the 1990s, guidance will be taken from the four principles elaborated at the New Delhi Global Consultation on Safe Water Supply and Sanitation for the 1990s held in September 1990 and adopted by the United Nations General Assembly in December 1990. These are:

Protection of the environment and safeguarding of health through integrated management of water resources and liquid and solid wastes;

Institutional reforms promoting an integrated approach including changes in procedures, attitudes and behaviour, and full participation of women at all levels in sector institutions;

Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes; and

Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies. Within this general framework, several specific approaches as appropriate need to be adopted.

Institutional Development

For sector development in the 1990s, the development of appropriate institutions is urgently needed. Effective institutions are essential not just for implementing and maintaining services and facilities, but for developing sector policies and plans, regulations, health education and awareness building policies and promotional and training activities. Institutions can take on many different forms and may be drawn from the government at the Central, State and local levels, from the private sector, from non-governmental organizations (NGOs) and the communities themselves. The strategy will be 'decentralization' with the involvement of the people and local institutions at all stages -planning, project formulation, execution, operation and maintenance and monitoring and evaluation. Community empowerment will be one of the keys to project sustainability. Private sector investment to the extent possible for drinking water and sanitation projects in both urban and rural areas needs to be explored. Gradually the role of the government will become promotional in water and sanitation services. A feasible but well knit collaborative network at national and State level with the national government taking the lead in regard to collaboration and cooperation and the exchange of experience, expertise and technology with external support agencies (ESAs) will be developed with appropriate action plans.

The Role of Women

An effective role of women, particularly among the poor unserved and underserved, can enhance the sustainability of water and sanitation services. Therefore, conscious involvement of women in project planning, implementation, O&M, monitoring and evaluation in managerial, professional, community-based and household roles will be well defined and appropriate action plans will be prepared.

Environmental Management

Based on the challenges, the prevailing environmental concerns of the water supply and sanitation programmes in the 1990s can be broken up into four areas:

- Conservation of water;
- Collection and disposal of human wastes and waste water;
- Collection, storage and safe disposal of solid wastes and industrial waste; and
- Resource recovery activities including wastewater reuse and waste recycling.

Human Resource Development

The strategy for human resource development in regard to the water supply and sanitation sector in the 1990s should address the broader concern of local capacity building. Information, education and communication (IEC) support should be an integral part f training for human resource development in the water supply and sanitation sector.

Operation and Maintenance

With regard to operation and maintenance, the following aspects should be emphasized:

i) Water has to be managed as a scarce resource;

ii) The supply of water to consumers should be based on the principle of effective demand which should broadly correspond to the level of service that the users are willing to maintain, operate and finance;

iii) In urban areas the municipalities/local bodies should be free to levy and raise appropriate user-charges for drinking water and sanitation facilities in order to strengthen the financial position of the urban local bodies/municipalities whereby at least the operation and maintenance costs, if not further development, become self-sustaining;

iv) In rural areas, water-tariffs should be levied and realized and affordable charges introduced so that operation and maintenance becomes self-sustaining to the extent possible;

v) Local bodies, whether in rural or urban areas, should be made responsible for the operation and maintenance of the system installed, with technical guidance from government agencies;

vi) Private sector efforts for construction and maintenance of drinking water projects should be encouraged and mobilized to the maximum extent possible;

vi) Measures should be taken to ensure proper operation and maintenance of water supply and sanitation systems installed by local bodies; and

vii) Appropriate links should be forged between water supply and environmental sanitation (solid and liquid waste management) while planning new programmes.

Financing

Financing is crucial to the provision of water and sanitation services. Financing of the sector presently relies heavily on subsidies, partly because institutions are unable to cover their costs (including operation and maintenance costs) through user charges. The following should receive attention for financing of the sector in the 1990s:

- Development of mechanisms and policy frameworks for financing the sector;

- Rationalization of financial management;

- Institutional finance, particularly for urban water supply and sanitation, although efforts should also be made with regard to rural water supply and sanitation;

- Establishment of an appropriate tariff structure to meet and recover O&M and capital costs for urban water supply and sanitation. User cost recovery in urban areas should become an important means of financing sector development. Appropriate water tariffs need to be levied for rural water supply systems so that O&M becomes self-sustaining;

- Mobilization of people's efforts to supplement the government's efforts to boost rural sanitation in the 1990s;

- Resource mobilization by encouraging private sector efforts for the construction and maintenance of water supply and sanitation projects in urban and rural areas; and

- Advance determination of what the Government, Communities, and private sector can best do including mechanisms to increase community participation in financial management and investment decisions.

Financing of the sector in the 1990s needs to be accelerated for both rural and urban sanitation followed by appropriate acceleration for both rural and urban water supplies.

a) **Urban**

Areas of action for the urban and rural sub-sectors are summarized below:

- careful planning;

- an integrated approach to problems;
- better coordination with the different agencies and sectors;
- effective financial management;
- optimal use of resources;
- proper manpower development through training and motivation;
- selection and application of appropriate technology and cost-effective techniques;
- proper operation and maintenance;
- systematic budgetary control;
- development of effective sector reporting and monitoring systems;
- fixing realistic tariff structures bearing in mind the affordability of different sections of the society;
- effective cost recovery; and
- involvement of the community and NGOs to the fullest extent.

Financial institutions, such as the Life Insurance Corporation (LIC) and the Housing and Urban Development Corporation (HUDCO), which are already extending loans for such infrastructure projects, have an important role to play in mobilizing financial resources for the sector.

b) Rural

For the rural water supply and sanitation sub-sector in the 1990s, the following are areas of specific attention:

- consolidation of the works done under the National Drinking Water Mission (renamed as Rajiv Gandhi National Drinking Water Mission in 1991);
- provision of potable drinking water to the entire unserved and underserved rural population;
- arrangements for technology development & technology transfer;
- renewed priority to water quality surveillance, defluoridation, excess iron removal, desalination and guineaworm eradication by 1995;
- optimal water resources development using scientific source-finding techniques;

- rainwater harvesting and water conservation measures, including recycling of wastewater;

- introduction of appropriate groundwater control legislation;

- increased importance attached to rural sanitation, promoting the concept of total environmental sanitation, including excreta and wastewater disposal, personal hygiene, house cleanliness, food hygiene and the collection and disposal of solid wastes; and

- restructuring of the rural sanitation programme, providing for the following elements:

  (a) implementation through local body/village panchayat, with beneficiary participation;

  (b) involvement of NGOs in the implementation of the programme where feasible;

  (c) active involvement of women;

  (d) beneficiary contribution in the form of cash, kind or physical labour, in order to engender among the population the realization that assets created belong to the local community;

  (e) linkages with primary health care, water resources, women's welfare, immunization and literacy mission activities; and

  (f) use of appropriate area specific approaches based on past experiences and studies.

3.4 FOCUS OF WHO SUPPORT

The World Health Organization (WHO) is the main UN agency collaborating with India in promoting and developing health care capabilities, including community water supply and sanitation. Collaborative support from WHO to India in the 1990s will continue to be available for community water supply and sanitation through the following services:

(i) Supplies and equipment;

(ii) Training/fellowships/study tours;

(iii) Short-term consultants; and

(iv) Subsidies for group educational activities/seminars/workshops/ meetings/conferences/studies, etc.

Assistance from WHO will mainly be used as seed money to generate health development activities and fill gaps in the National Health Programme, of which community water supply and sanitation is an important component.

The focus of WHO support to India in the 1990s will be on the promotion and development of health care capabilities, including expansion of sustainable community water and sanitation services; the inclusion of the health component in water resources management; the development of improved environmental technologies; and operation and maintenance as well as institutional aspects of water and sanitation. WHO will continue to collaborate and cooperate with other international and bilateral support agencies in community water supply and sanitation in India with the aim of achieving the goal of health for all by the year 2000 A.D.

a) Urban Sub-sector

Support from WHO in the 1990s will include collaboration in the following areas:

- Water quality surveillance and control;
- Sector management information systems;
- Solid and liquid wastes management;
- Human resources development;
- Operation and maintenance; and
- Health and hygiene education.

b) Rural Sector

- Community participation and community management of facilities, including preparation of manuals;
- Guineaworm disease eradication;
- Development and transfer of appropriate technology, particularly for on-site sanitation improvements;
- Water quality monitoring;
- Operation and maintenance;
- Removal of fluorides from drinking water;
- Human resources development and training; and
- Sector information management.

Table 1 : BREAKUP OF URBAN WATER SUPPLY AND SANITATION COVERAGE BY STATE/UNION TERRITORY AT THE END OF 1990

STATES Population in Thousands

S. No.	Name of State/City	Estimated Urban Population	Population provided with			
			Water Supply	%	Sanitation	%
	Andhra Pradesh (excluding Hyderabad)	13,430	8,400	63	1,690	13
1	Hyderabad	2,670	2,670	100	1.580	59
	Total Andhra Pradesh	16,100	11,070	69	3,270	20
2	Arunachal Pradesh	111	111	100	111	100
3	Assam	2,347	881	38	369	16
4	Bihar	12,011	8,381	70	4,660	39
5	Goa	438	432	99	180	41
6	Gujarat	14,930	14. 271	96	11,944	80
7	Haryana	3,388	3,388	100	3,388	100
8	Himachal Pradesh	426	426	100	120	28
9	Jammu & Kashmir	1,899	1,859	98	182	10
	Karnataka (excluding Bangalore)	9,757	9,425	97	4,563	47
10	Bangalore	4,353	4,000	92	3,400	78
	Total Karnataka	14,110	13,425	95	7,963	56
11	Kerala	5,630	4,199	75	400	7
12	Madhya Pradesh	13,864	13,217	95	2,412	17

Table 1 (Continued)

STATES

S. No.	Name of State/City	Estimated Urban Population	Population provided with			
			Water Supply	%	Sanitation	%
	Maharashtra (excluding Bombay)	28,046	27,968	99	18,241	65
13	Bombay	10,500	9,975	95	9,975	95
	Total Maharashtra	38,546	37,943	98	28,216	73
14	Manipur	641	454	71	60	9
15	Meghalaya	347	347	100	63	18
16	Mizoram	162	89	55	10	6
17	Nagaland	189	44	23	18	10
18	Orissa	4,602	1,740	38	1,555	34
19	Punjab	5,673	4,038	71	3,213	57
20	Rajasthan	11,158	11,153	100	1,021	9
21	Sikkim	138	92	67	73	53
	Tamil Nadu (excluding Madras)	18,381	7,456	41	3,800	21
22	Madras	4,352	4,162	96	3,699	85
	Total Tamil Nadu	22,733	11,618	51	7,499	33
23	Tripura	344	183	53	39	11
24	Uttar Pradesh	24,464	23,604	96	11,122	45

Table 1 (Continued)

STATES

S. No.	Name of State/City	Estimated Urban Population	Population provided with			
			Water Supply	%	Sanitation	%
25	West Bengal (non-CMDA)	6,161	3,080	50	1,261	20
	Calcutta	11,420	10,100	88	5,775	51
	Total West Bengal	17,581	13,180	75	7,036	40
Total States		**211,832**	**176,145**	**83**	**94,924**	**45**

UNION TERRITORIES

S. No.	Name of Union Territory/City	Estimated Urban Population	Population provided with			
			Water Supply	%	Sanitation	%
26	Andaman & Nicobar Islands	90	90	100	90	100
27	Chandigarh	740	740	100	740	100
28	Dadra & Nagar Haveli	20	16	80	7	35
29	Daman & Diu	48	48	100	43	90
30	Delhi	8,081	7,965	99	7,300	90
31 32	Lakshadweep & Pondicherry	378	378	100	326	86
Total Union Territories		9,357	9,237	99	8,506	91
GRAND TOTAL		**221,189**	**185,382**	**84**	**103,430**	**47**

Table 2 : WATER SUPPLY AND SANITATION COVERAGE - ALL INDIA

(Population in millions)

Sector		At start of the Decade, i.e. as on 31 March 1981				At the end of the Decade, i.e., as on 31 March 1991			
		Served		Unserved		Served		Unserved	
		Pop.	%	Pop.	%	Pop.	%	Pop.	%
1	Rural Water Supply	162	31	362	69	465.5	74.22	161.64	25.78
2	Rural Sanitation	2.80	0.5	521.20	99.5	15.87	2.53	611.27	27.47
3	Urban Water Supply	115.47	72.30	44.34	27.70	185.38	83.81	35.81	16.19
4	Urban Sanitation	40.03	25.01	119.79	71.96	103.13	16.76	117.76	53.24

Table 3 : WATER SUPPLY & SANITATION COVERAGE

(Population in millions)

SUB-SECTOR	Years													
	1970[1]		1975[1]		1980[1]		1985[2]		1990[2]		1995[3]		2000[3]	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	109	66.3	128	107	159.73	115.47	174	127	217.18	183.2	258.3	240	307	295
Urban Sanitation	109	30	128	35.5	159.73	25.01	174	49.60	217.18	102.2	258.3	171	307	240
Rural Water Supply	458	25	487	86	524	162	558	314	627.14	465.5	667	640	699	699
Rural Sanitation	458	0.5	487	1.7	524	2.8	558	4.03	627.14	15.9	667	31	699	46

Pop. = Total Population
Cov. = Population covered

Sources

IDWSSD Commencement Report
Evaluation of IDWSSD in SEAR
National report

Table 4 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	185.38	69.91	306.9	255.29	83	295.2	96	121.52	1.74
Urban Sanitation	103.13	78.12	306.9	181.25	59	239.8	78	136 67	1 75
Rural Water Supply	465.5	303.5	699.3	769	110	699.3	100	233.8	0.77
Rural Sanitation	15.9	13.1	699.3	29	4	45.7	6	29 8	2.27

Table 5 : EXPLOITATION OF WATER RESOURCES

Purpose		Demand (Km^3) in the year		
		1990	2000	2025
1	Domestic use	25	33	52
2	Irrigation	460	630	770
3	Energy	19	27	71
4	Industrial use	15	30	120
5	Others	33	30	37
	Total :	552	750	1050
-	Surface Water	362	500	700
-	Ground Water	190	250	350

Source: 1. Country overviewed - India - Page 203, Women and Water - Proceedings of a Regional Seminar on Women and Water - The Family Hand Pump, Manila, 29 August - 1 September 1989, Published by ADB & UNDP.

2. Theme Paper on Water Conservation - Page 2 - prepared by Central Water Commission in connection with Water Resources Day 1991.

Table 6 : APPROVED OUTLAY AND UTILIZATION OF FINANCIAL RESOURCES DURING THE DECADE

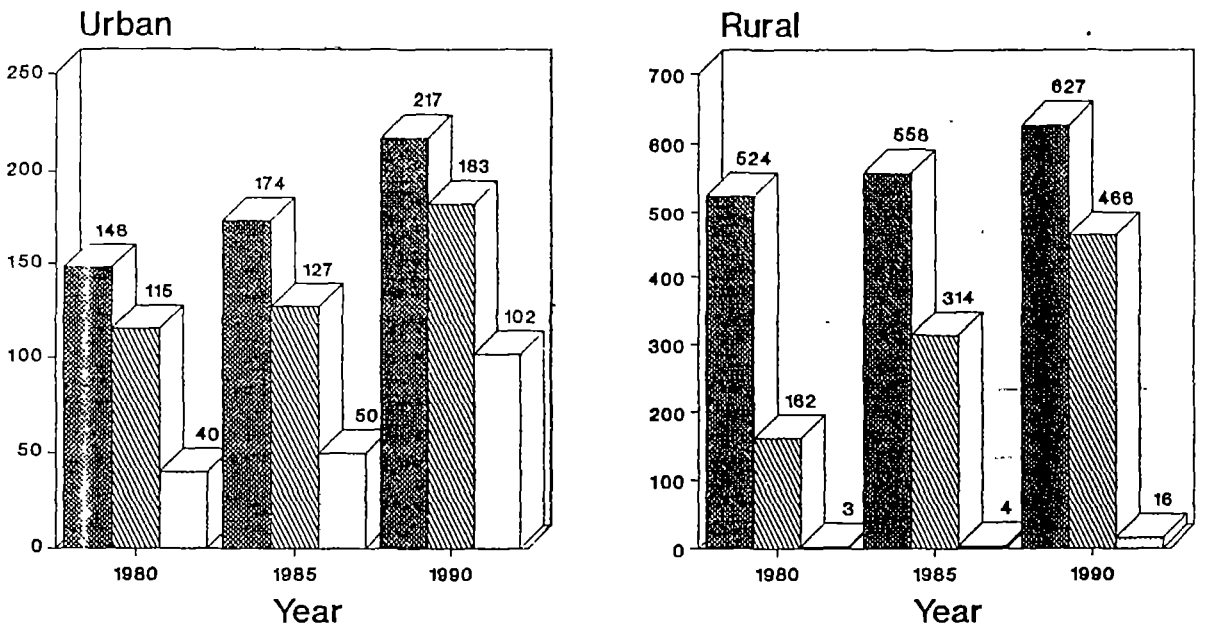
Sector	Approved Outlay		Utilization		%
	Rs. in billion	US$ in billion	Rs. in billion	US$ in billion	Utilization
A. Rural Sector					
1. Rural Water Supply	62.52	4.89	76.70	5.99	122
2. Rural Sanitation	2.22	0.17	1.69	0.13	76
Total Rural Sector (A)	64.74	5.06	78.39	6.12	121
B. Urban Sector					
3. Urban Water Supply) 4. Urban Sanitation)	55.28	4.32	46.64	3.64	84
Total Urban Sector (B)	55.28	4.32	46.64	3.64	84
Grand Total (A + B)	120.02	9.38*	125.03	9.76	104

* 1 US $ = Rs.12.79 (1981-91) average exchange rate.

Figure 1

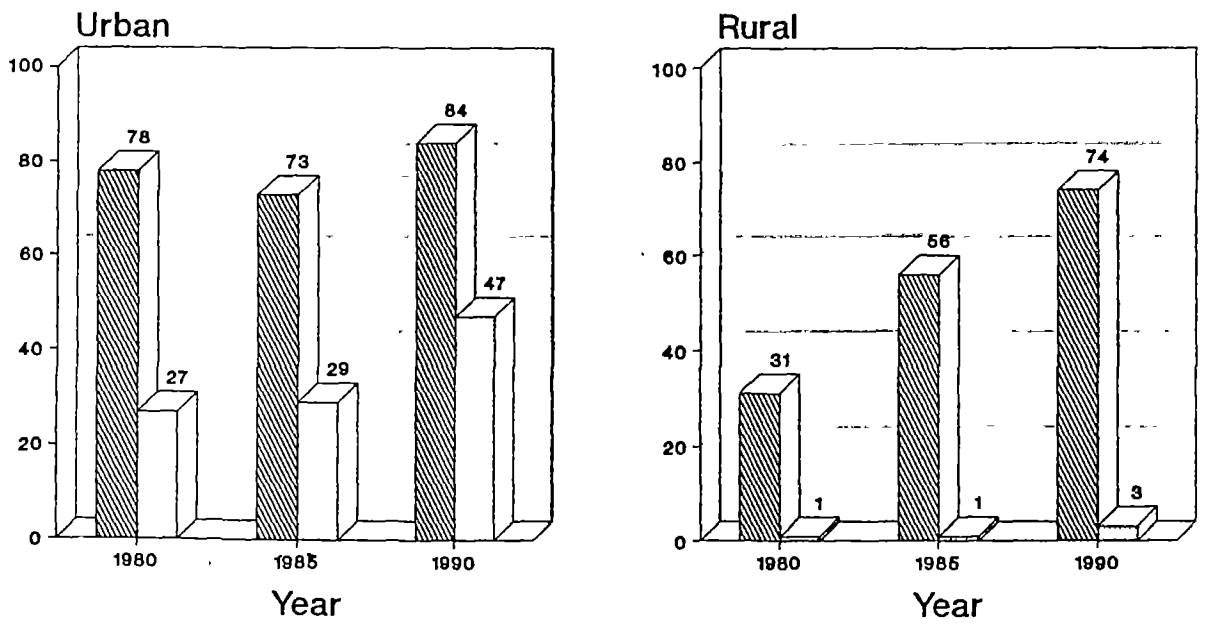
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

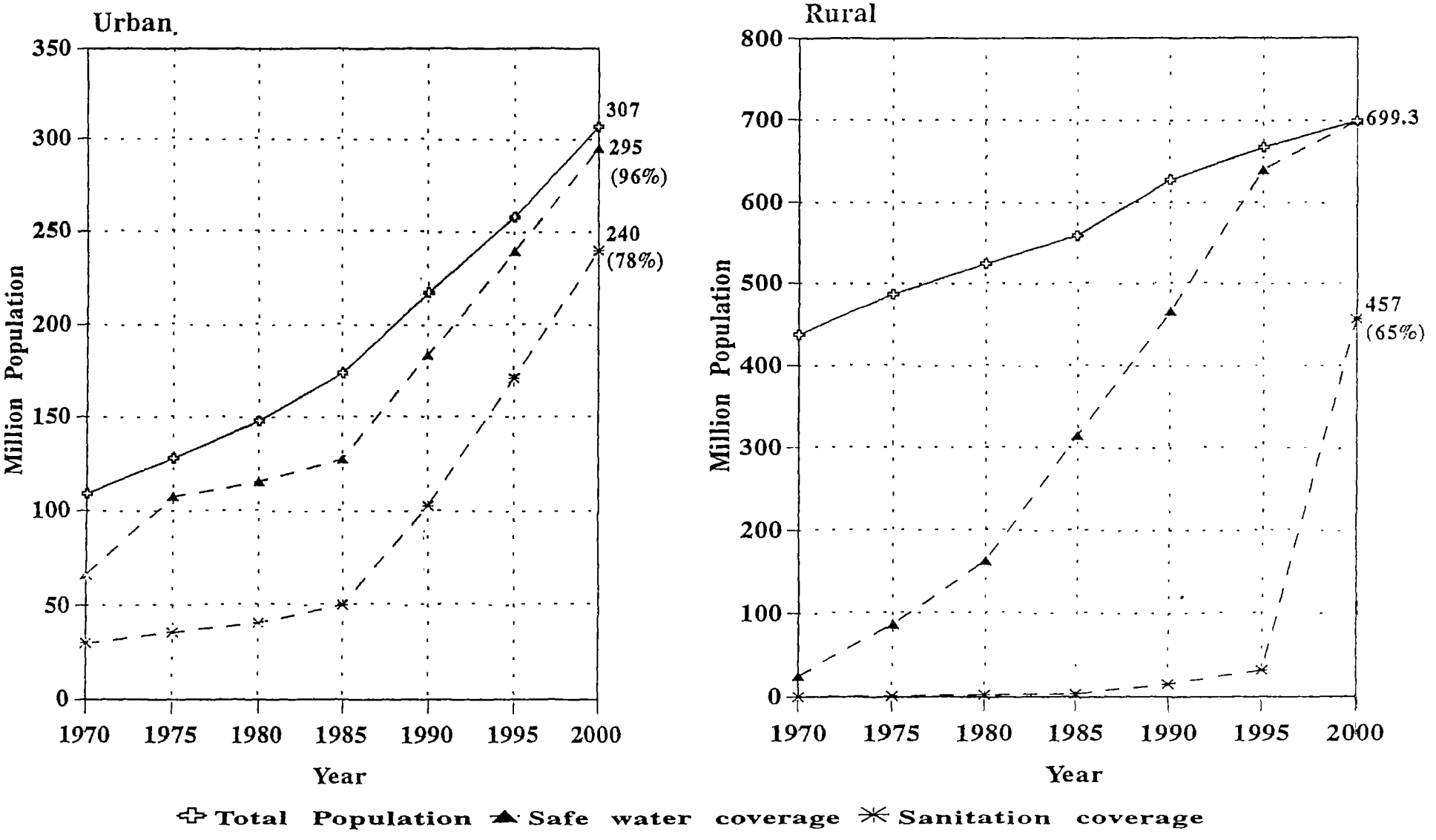
% of Population



INDIA

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



4. INDONESIA

4.1 DECADE ACHIEVEMENTS

The responsibility for activities in the water supply and sanitation sector is shared between three ministries. The Ministry of Public Works is responsible for the technical aspects of planning and construction, the Ministry of Health for the guidance and control of environmental health aspects and water quality, and the Ministry of Home Affairs for the management and administration of completed water supply systems and sanitation facilities and for the promotion of community participation. A Central Coordinating Committee (CCC) has been established at the central level with officials from directorates of these ministries to provide coordination in planning, programming and monitoring among agencies and local government bodies.

The service coverage targets set for the Decade were 75 per cent for urban water supply, 60 per cent for rural water supply, 60 per cent for urban sanitation and 40 per cent for rural sanitation. It is estimated that at the end of the Decade, the following levels of coverage have been achieved:

- 65 per cent in urban water supply, equivalent to 36 million population.
- 33 per cent in rural water supply, or 41 million.
- 42 per cent in urban sanitation, or 23 million.
- 30 per cent in rural sanitation, or 37 million.

Table-1 shows coverages of populations achieved and targets for the future. Table-2 shows the projected population coverage and acceleration required to meet the targets. Figures 1 and 2 provide graphic presentations of coverages and targets.

Despite not having reached the targets, significant progress in the sector was achieved. Piped water supply has been brought to many cities, towns and semi-urban areas where previously the inhabitants were largely dependent on potentially contaminated sources. Rural communities also benefited from improved access to safe water supply through piped and non-piped systems (handpump, protected well). In sanitation, significant progress has been made.

A major reason for the shortfall in reaching the goals has been the considerable population growth which has increased demands for services at a pace that has not been matched by infrastructure or construction of services. Secondly, implementation was over-centralized and not always developed according to the priorities of the local government. Thirdly, the fall in oil revenue after 1984 seriously affected the internal funds available to the sector, curtailing investment in new projects and involving

dependence on foreign aid. Since most external funds came from lending agencies, such as the World Bank and the Asian Development Bank, which require cost-recovery for their projects, these funds were mostly used for urban services. For the same reasons, low priority was generally given to the support programmes of national institution development, community participation and human resources development, for which funding was marginal compared to the allocations for the coverage programmes.

National investment in the sector has increased from US$ 300 million in the period 1980-1984 to US$ 630 million in the 1985-1989 plan period. Investment in the 1990-1994 period is planned to be increased to US$ 2,600 million, or about four times the amount in the previous plan period. Significant increase is therefore expected in both urban and rural coverage.

4.2 TARGETS FOR THE YEAR 2000

With the increased investment and effort in the sector, the country is setting an ambitious target of increased water supply and sanitation coverage for the year 2000 as follows:

Urban water supply	95% coverage
Urban sanitation	90% coverage
Rural water supply	80% coverage
Rural sanitation	75% coverage

4.3 AREAS OF ACTION IN THE 1990s

In order to achieve better results for future sector development, there are a number of aspects of existing policy and strategies for programme implementation which need to be strengthened. The following areas of action have been identified in order to overcome the related constraints/issues identified during the Decade.

(1) Financial Resources

Even though national investment in the sector is planned to be increased four-fold in the 1990-1994 plan period, efforts will be made to continue and increase support from bilateral aid agencies, to interest them in the rural sub-sector, to encourage greater flexibility in respect of local-cost financing and the use of local materials and equipment, and to cooperate more closely in adopting uniform policies and approaches. Involvement of the private sector in financing and managing development will also be used to supplement the sources of funds made available from the Central Government.

(2) Strengthening of Local Government Capability

Efforts will be continued to strengthen local government capability in the planning, programming, financing, implementation and management of sector development.

(3) Sector Balance

In reviewing the priorities in the sector, consideration will be given to the protection of surface and groundwater sources and to redressing the current imbalance (water supply : sanitation and urban : rural). Urban water supply has continued to receive relatively high inputs of central funding and has attracted the major part of external funding, as compared to urban and rural sanitation.

(4) Manpower

Greater emphasis will be placed on institutional and human resources development. Attention has up to now been focused on physical programmes rather than on the training of personnel for the delivery of services and their operation and maintenance. Studies will be undertaken to assess manpower needs at all levels and appropriate measures will be taken to organize courses for engineers, technicians, plant operators, water quality analysts, health educators, village volunteers and caretakers, etc. on promotion of hygiene and proper use of water supply and sanitation facilities.

(5) Community Participation

The promotion of community participation for rural areas needs to be encouraged in a more efficient and effective way, particularly through a self-help approach or through traditional mutual cooperation. The programmes of community participation already being implemented by different agencies will be coordinated and rationalized to avoid confusion, with greater emphasis on health education, public awareness campaigns and the importance of involving women in the villages as motivators and facilitators to ensure sustainability of installed facilities and expansion of self help systems.

(6) Information Systems

The information system for the reporting and monitoring of projects in the water supply and sanitation sector needs to be further improved, and efforts will be made to establish an efficient but uncomplicated system of sector information management to serve the various agencies involved.

(7) Maintenance and Rehabilitation

Budgetary restrictions have, in the past, limited the funds available for carrying out preventive maintenance on existing facilities and for the rehabilitation of plants that are not functioning efficiently. Some of these facilities have been experiencing losses through leakage and general unaccounted for water as high as 50 per cent. Community management and cost recovery will be promoted in order to meet the operation and maintenance of facilities on a self-financing basis. Recognizing the savings which can be made by rehabilitating facilities instead of constructing new schemes, increased budgetary provisions will be made for rehabilitation and for the training and deployment of personnel.

4.4 FOCUS OF WHO SUPPORT

The Organization will strive to promote active collaboration among the national sectoral agencies and ESAs involved. The WHO support will centre on collaboration with the Government with emphasis on community participation, including strengthening of the role of women in all aspects of the development process.

The technical support from WHO in the 1990s will include assistance in the following:

- Manpower development, particularly at the local government level
- Surveillance and control of water quality
- Monitoring and evaluation of sector development
- Resource mobilization and coordination of external support
- Promotion of hygiene education to expand sanitation coverage.

Table 1 : WATER SUPPLY & SANITATION

COVERAGE & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995***		2000***	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	37	4	43	10	50	17	59	26	55	36	39.5	35.55	54.3	51.59
Urban Sanitation	37		43	6	50	14	59	19	55	23	39.5	31.6	54.3	48.87
Rural Water Supply	84	1	91	5	97	18	106	38	124	41	157.8	102.57	162.9	130.32
Rural Sanitation	84	4	91	6	97	20	106	40	124	37	157.8	94.68	162.9	122.18

Pop. = Total Population
Cov. = Population covered
* = IDWSSD Commencement Report
** = IDWSSD Evaluation in SEAR
*** = Ministries of Health & Public Works, Indonesia
Note: *Reduction in urban population and corresponding rise in rural population is due to declassification of population in small towns as rural population from 1991 onwards.*

onwards.

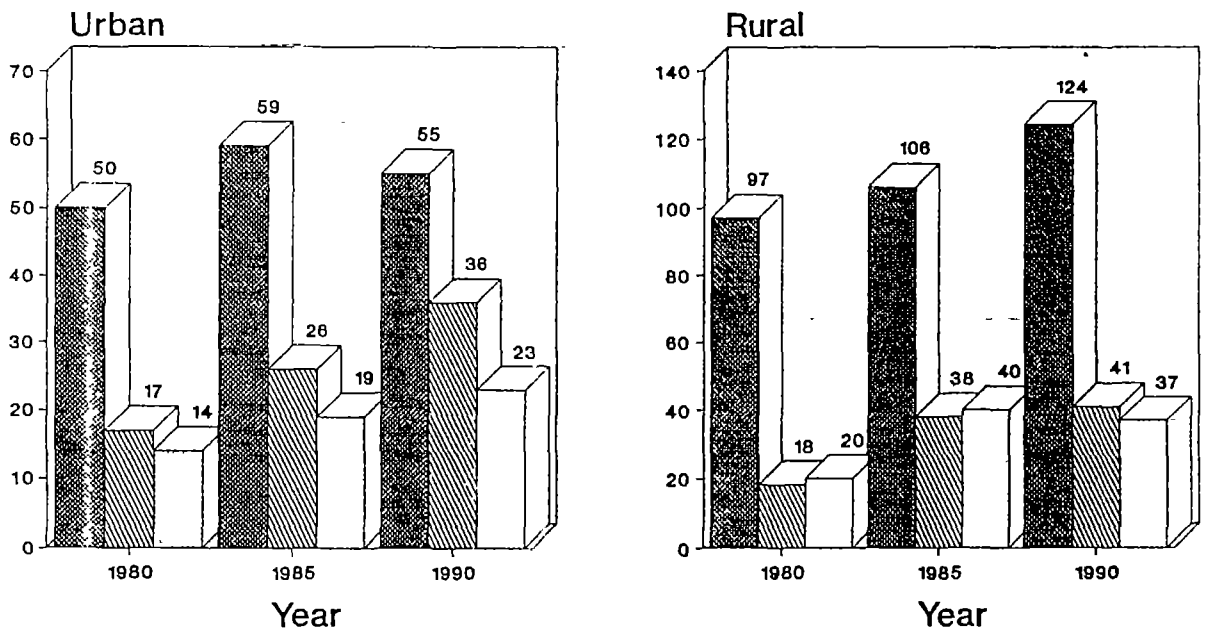
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	36.0	19.0	54.3	54.3	100	51.59	95	15.59	0.82
Urban Sanitation	23.2	9.2	54.3	32.4	60	48.87	90	25.67	2.79
Rural Water Supply	41.0	23.0	162.9	64.0	40	130.32	80	89.32	3.88
Rural Sanitation	37.0	17.0	162.9	54.0	33	122.18	75	85.18	5.01

Figure 1

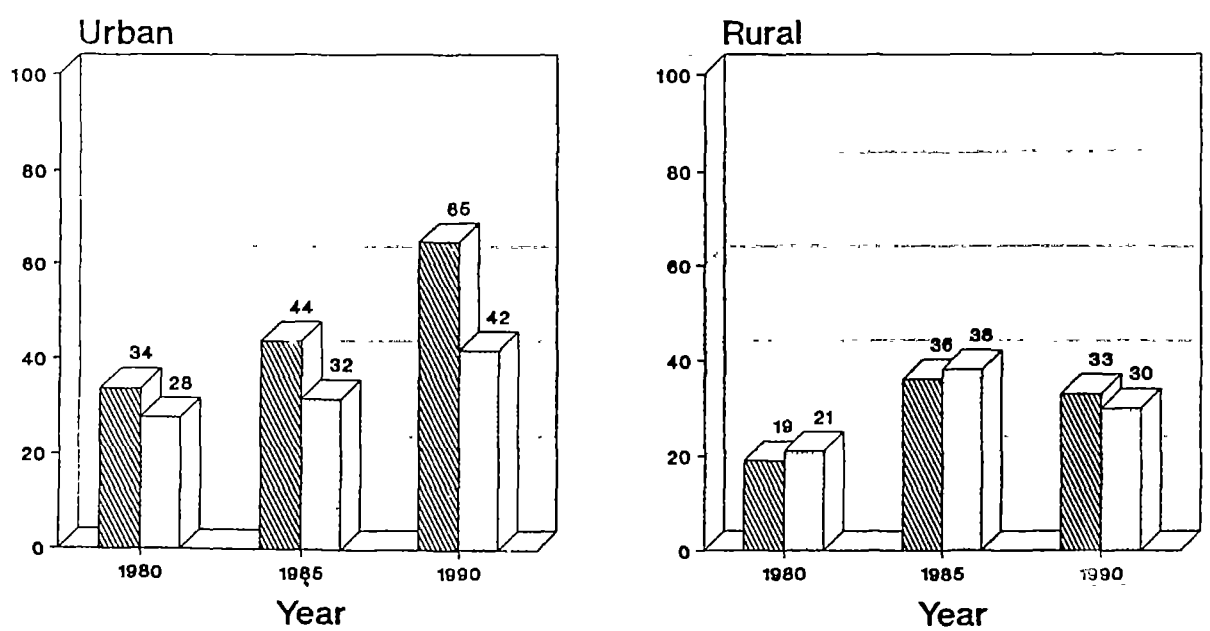
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

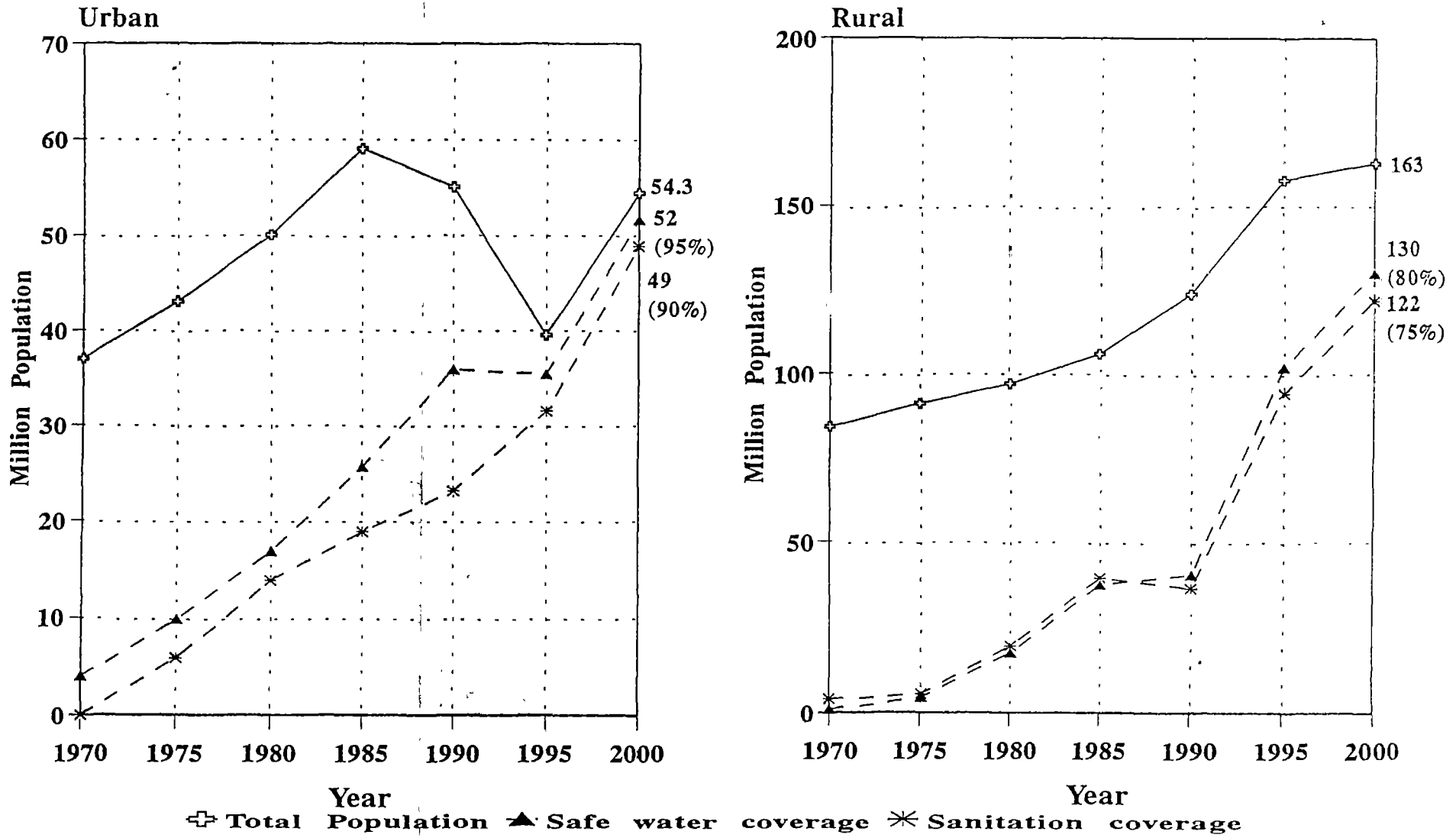
% of Population



INDONESIA

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



5. MALDIVES

5.1 DECADE ACHIEVEMENTS

The Maldives Water and Sanitation Authority of the Ministry of Health, established in 1973, was entrusted at the start of the Decade with the task of formulating a National Plan for Drinking Water Supply and Sanitation despite two major difficulties - lack of data and qualified personnel. Priority was given to data collection and, in September 1980, a plan was produced, with the help of key ministries and UN agencies, at the same time as the country's First National Health Plan. This envisaged primary health care (PHC) as the key approach for the provision of basic health facilities, including safe drinking water and sanitation.

The coverage targets proposed in the Decade Plan were set ambitiously at 92 per cent and 80 per cent for water supply to urban and rural populations, and 100 per cent and 40 per cent for sanitation. The policy approach was based on community involvement at all stages, giving precedence to the needy, adopting socially acceptable and economically viable systems, and integrating with other relevant programmes, especially PHC.

Table 1 shows coverage of the population achieved and targets for the future. Table 2 shows projected population coverage and acceleration required to meet the targets. Figures 1 and 2 provide graphic presentation of coverages and targets.

In 1980, the service coverage of the urban population with water supply and sanitation was about 11 per cent, whereas rural water supply coverage was only 3 per cent and rural sanitation 1 per cent. The freshwater aquifer in Male had already become badly contaminated, many of the shallow wells on the islands were of doubtful quality, and excreta disposal practices consisted of either a reserved area within each housing plot in Male or else the beach. In rural areas, i.e., in islands other than the capital Male and some tourist resorts, a very small number of persons could be said to have had access either to safe drinking water supply or to sanitation services.

While progress in the urban sub-sector was satisfactory, a slow start in project implementation was caused by late receipt of funds, and considerably less than half of the target levels had been reached by 1985. Problems had also arisen regarding acceptance by the communities of the public latrine services provided. However, with contributions totalling nearly US$ 12 m from SFD, KFW, EEC, DANIDA and France for improvements in Male, it was estimated that by 1990, 96 per cent of the urban population would have access to safe water and about 88 per cent to adequate sanitation facilities. In rural areas, despite inputs from UNICEF, UNCDF, UNEOTF, UNDP and private organizations, coverage reached only 33 per cent with water supply and 1.6 per cent with excreta disposal facilities (public toilets).

The infant and child mortality rates, which were 98 and 16 per 1000 in 1980, had fallen to 34 and 4 per 1000 respectively by 1990. Case fatalities from water-borne diseases have also declined sharply in this period. These improvements are considered to be largely due to the improvements in water supply and sanitation.

5.2 TARGETS FOR THE YEAR 2000

The Government of Maldives, committed to the achievement of Health for All by the year 2000, has set up ambitious targets for the sector. The targets established are as follows:

Urban water supply	100% coverage
Urban sanitation	100% coverage
Rural water supply	100% coverage
Rural sanitation	40% coverage

The diminishing sources of fresh water pose a particular challenge for the country in achieving the targets.

5.3 AREAS OF ACTION IN THE 1990s

The Government is committed to achieving 100 per cent coverage in urban drinking water supply and sanitation, 100 per cent coverage in rural drinking water supply, and 40 per cent coverage in rural sanitation by the year 2000. The Maldives Water and Sanitation Authority will shortly draw up a realistic working programme to achieve these targets.

The following areas of actions for the 1990s will be implemented in order to overcome the related constraints/issues.

(1) Shortage of Fresh Water

Since the aquifer lenses in Male and in some of the more populated islands are polluted and, in many cases, subject to saline intrusion, the least expensive option for providing drinking water is to collect and store rain water in public and individual rainwater tanks. In Male, desalination plants have also been installed to supplement ground and rainwater to meet the drinking water needs. The programme of creating additional roof catchments and constructing or installing prefabricated storage tanks for rain water, which has proved successful in Male, will be intensified in the outlying islands. At the same time, where shallow wells are still used for domestic water supply, protection of these will be pursued together with a programme of chlorination as appropriate. Measures will also be taken so that excess rainfall which cannot be captured is channelled to recharge aquifers not yet polluted.

(2) Rural Sanitation

The construction of latrines in the rural islands will be given higher priority and the programme accelerated. A new design, which is considered likely to have higher user acceptance than the previous designs, will be used and more attention will also be given to private, rather than communal facilities, as these have proved more acceptable.

(3) Manpower

As MWSA's Rural Section, Planning Section and Technical Section are understaffed, it is proposed that they be strengthened. Training programmes will be featured in future programmes, including those for local masons in constructing water storage tanks and latrines.

(4) Operation and Maintenance

The constraints due to shortage of technicians and lack of funds will be addressed by training more operators, village caretakers and local communities as appropriate.

(5) Logistics

The fact that all materials for construction have had to be transported by boat from Male to the other islands for any construction to be carried out has made it difficult to plan and supervise project activities. Future programmes will take into account this factor in project planning.

(6) Funding

While the facilities in Male have largely been funded by bilateral external resource agencies, the rural sector has had to rely on the more limited resources of agencies of the UN system. Efforts will be made to mobilize resources for the urban sector to harness additional sources of water supply for Male and for water supply and sanitation facilities in other islands.

(7) Institutional Framework

The institutional set up of MWSA will be strengthened by making necessary changes.

(8) Sector Priority

During the Decade, priority was given to facilities in Male and only minor attention paid to the other islands, especially in respect of sanitation. Higher priority will be given to increased coverage in other islands, particularly in regard to sanitation.

(9) Health Education

Although some attention has been given to health education through radio and television programmes, it has proved inadequate, and Decade campaigns to mobilize support, particularly of women, for the rural sector were ineffective. MWSA will continue to work closely with rural women's committees, the Department of Women's Affairs and island development committees. Health and hygiene education will be strengthened at the island level and the community will be involved in all aspects of the projects to be implemented.

5.4 FOCUS OF WHO SUPPORT

WHO support in the 1990s will centre on the promotion of sector activities emphasizing community participation particularly involvement of women in all phases of the development process. The Organization will strive to promote active collaboration among the ESA as well as national agencies in sector development.

Support from WHO in the 1990s will include assistance in the following:

- provision of rainwater tanks and protection of groundwater aquifers from pollution and saline intrusion;
- provision of low-cost sanitation, appropriate and acceptable to the community;
- training, including training in the construction of water tanks and latrines, operation and maintenance, community management of facilities and health education;
- sector development planning, and
- water quality surveillance.

Table 1 : WATER SUPPLY & SANITATION

COVERAGE & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995***		2000***	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	0.012	0.0	0.014	0.0	0.038	0.004	0.05	0.03	0.06	0.053	0.07	0.07	0.08	0.08
Urban Sanitation	0.012	0.0	0.014	0.00	0.038	0.022	0.05	0.027	0.06	0.050	0.07	0.07	0.08	0 08
Rural Water Supply	0.097	0.0	0.106	0.00	0.123	0.004	0.14	0.02	0.161	0.052	0.18	0.08	0.20	0 20
Rural Sanitation	0.097	0.0	0.106	0.00	0.123	0.001	0.14	0.002	0.161	0.003	0.18	0.004	0.20	0.08

. = Total Population
. = Population covered
= IDWSSD Decade Commencement Report, WHO 1983
= IDWSSD Evaluation in SEAR
= Country IDWSSD Assessment Report

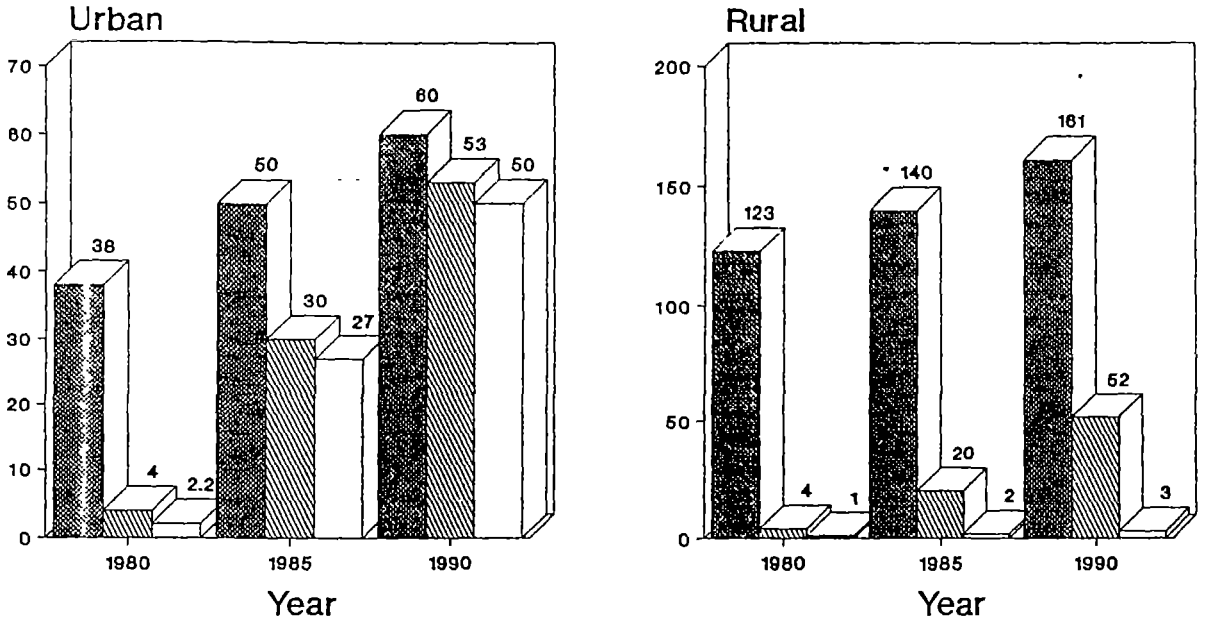
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	0.053	0.049	0.08	0.08	100	0.08	100	0.027	0.55
Urban Sanitation	0.060	0.028	0.08	0.078	98	0.08	100	0.030	1.07
Rural Water Supply	0.052	0.048	0.20	0.20	100	0.20	100	0.028	0.58
Rural Sanitation	0.003	0.002	0.20	0.005	2.5	0.08	40	0.077	38.5

Figure 1

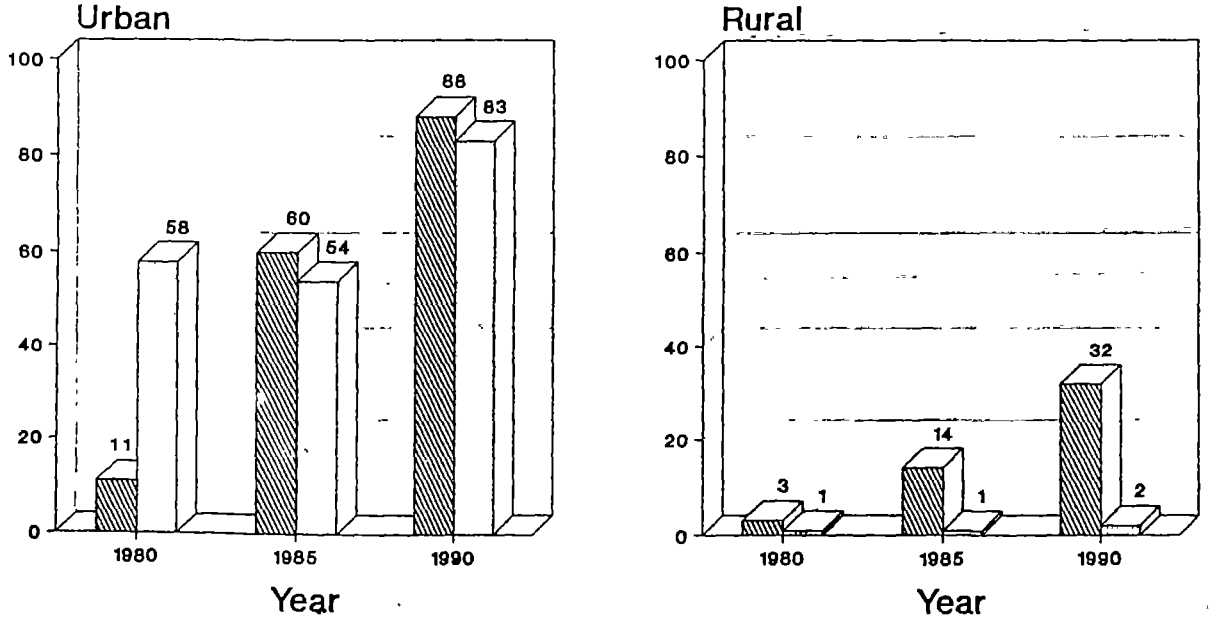
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In thousands



Legend : Total Population Water Supply Coverage Sanitation Coverage

% of Population

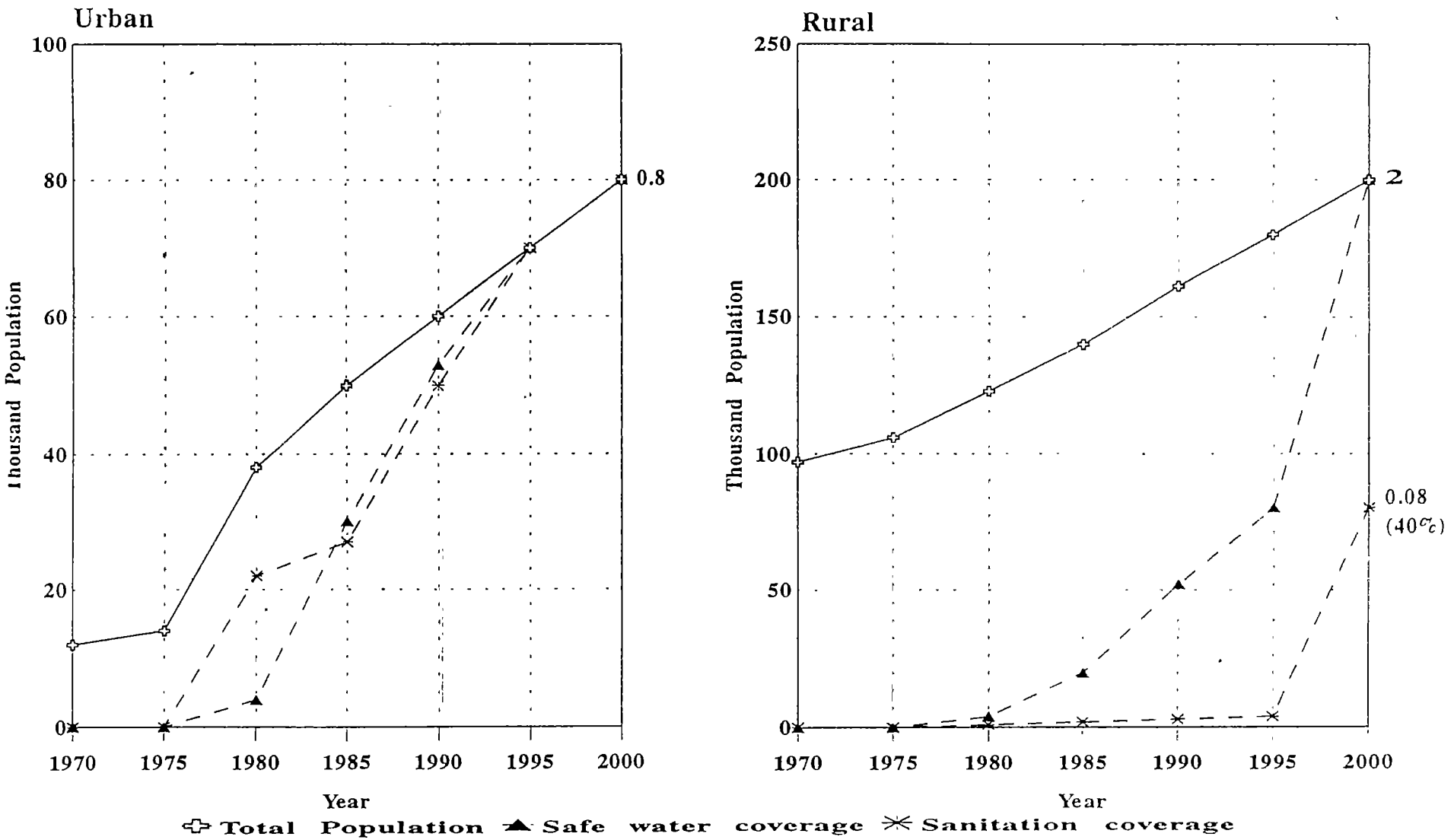


MALDIVES

Figure 2

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



6. MONGOLIA

6.1 DECADE ACHIEVEMENTS

The Government established a special inter-ministerial commission of sector agencies to implement and monitor relevant activities during the International Drinking Water Supply and Sanitation Decade. This commission consists of the State Planning Committee, the State Committee on Science and Technology, and the Ministries of Water Resources, Social Services, Construction, Health, and Agriculture.

The goals set in order to improve water supply and sanitation in urban and rural areas during the Decade included the following:

- To coordinate the activities of different ministries in regard to the construction, utilization and monitoring of water supply and sewerage systems.
- To cooperate with international organizations in improving water supply and sanitation.
- To improve the planning, design and construction of facilities and the training of skilled staff.
- To prepare a plan for the improvement of sector activities.
- To build water supply units and adequate hygienic latrines in the yurt regions.
- To explore the use of solar and wind energy.
- To increase the number of wells constructed in collective and state farms.
- To solve the problems of improving water supply and sanitation for the rural populations.
- To improve hygienic conditions in hospitals which do not yet have centralized water supply and sewerage systems.
- To instal and monitor water treatment and disinfection systems.
- To introduce measures for improving water supply and sanitation in schools.
- To train staff at all levels for improvement of the sector.

- To improve water quality control and surveillance of water pollution.

- To improve the production of building materials for water supply and sewerage systems.

- To take measures to improve the quality of water where it is necessary by softening, defluoridating and chlorinating it.

The plans prepared were followed and the outputs included the following:

- Increased population served with centralized water supply schemes and corresponding reduction of mobile supply systems.

- More than 30 communities provided with centralized water and sewerage systems and 90 more systems are under preparation.

- Ten resolutions of the Council of Ministers and 20 state standards relating to water pollution, standards, hygiene criteria etc.

- A "Protection of Nature" month observed in 1983.

- Annual checks on protection and use of water reserves and sewage treatment plants by legal and Sanepid Control organizations.

- Progress reports to WHO and other international organizations on six occasions.

- Experimental work with UNDP assistance on solar and wind energy and bioenergy utilization.

- Approval by the Council of Ministers of the programme of cooperation with international organizations.

- Establishment of the State Committee on Nature and Environment Control.

- Fellowship training with WHO support of 23 national physicians, engineers, chemists and others; courses and refresher training for 21 hygienist engineers; and 7 seminars attended by more than 160 technicians.

- Strengthening of laboratory services at the Institute of Hygiene, Epidemiology and Microbiology, and at other laboratories in 3 cities and 18 aimaks.

- Implementation of a programme to expand service coverage by water supply of yurt regions by digging 290 wells, by increasing the number of water-carrying lorries by 450, by providing 130 more water supply points, and to connect about 3800 families in urban areas to centralized systems.

The position reported at the end of the Decade is that 100 per cent of the urban population is served with safe water supply and adequate excreta disposal facilities, and, in rural areas, 58.5 per cent have safe water and 46.5 per cent have access to adequate sanitation facilities. Table 1 shows coverage of populations achieved and targets for the future.

6.2 TARGETS FOR THE YEAR 2000

The country is well on the way to achieving universal access to safe drinking water by the year 2000. The universal access to sanitary excreta disposal facilities is also possible but to a limited extent owing to the lifestyle of the rural population.

The projected coverage for the year 2000 is as follows:

Urban water supply	100% coverage
Urban sanitation	100% coverage
Rural water supply	100% coverage
Rural sanitation	100% coverage

6.3 AREAS OF ACTION IN THE 1990s

The Government will continue to implement urban water supply and sanitation activities as provided for in the plans to keep 100% population coverage. Particular attention will be paid to accelerating activities in rural areas to attain 100% coverage by the year 2000. The following areas of action have been identified in order to overcome the related constraints/issues:

(1) Technical Assistance

Assistance will be mobilized from United Nations and other external support agencies for:

- the development of municipal and industrial wastewater treatment and reuse systems;
- the introduction of technology for improving water quality;
- the introduction of an accounting system for water use;
- the establishment and strengthening of laboratory services for water and sewage treatment plants;
- the construction of plants for the processing of solid wastes;
- study of the experience in more developed countries in regard to the organization and surveillance of water supply and sanitation services, and

- training management personnel, particularly in hygiene and sanitation promotion.

(2) Monitoring Systems

Efforts will be made to establish a sector information management and monitoring system for the water supply and sanitation sector. External consultant support for this will be sought.

(3) Water Quality Control

A study on the quality of surface and groundwater sources and their protection will be conducted as well as one for the introduction of a system for the surveillance of water quality in a systematic manner. Consultant services will be used in support of this study.

6.4 FOCUS OF WHO SUPPORT

The Organization will strive to promote active collaboration among national sector agencies and ESAs in sector development. The support will centre on collaboration with the Government with emphasis on community participation, including strengthening the role of women in the development process in the 1990s. WHO will provide collaborative technical support, particularly in the following areas:

- sector development planning;
- the development of appropriate technologies in water supply and sanitation, including wastewater treatment;
- human resources development, including technical and managerial aspects;
- water quality surveillance, including strengthening of laboratory services, and
- development of a sector information management system.

Table 1 : WATER SUPPLY & SANITATION

COVERAGE & TARGETS
(Population in millions)

SUB-SECTOR	Years													
	1970		1975		1980		1985		1990		1995		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply									1.08	1.08	1.3	1.3	1.5	1.5
Urban Sanitation									1.08	1.08	1.3	1.3	1.5	1.5
Rural Water Supply									1.01	0.59	1.2	1.0	1.4	1.4
Rural Sanitation									1.01	0.47	1.2	0.9	1.4	1 4

Pop. = Total Population
Cov. = Population covered

7. MYANMAR

7.1 DECADE ACHIEVEMENTS

Within the framework of the National Development Policy and under the guidelines set by the Myanmar Socialist Programme Party, the Decade Plan was formulated in 1980, defining the objectives and goals, setting the targets, formulating strategies, allocating institutional responsibilities, and establishing financial, manpower and material needs.

The responsibility for the sector is shared among various organizations, principally as follows:

Urban water supply : Urban Water Supply Division (UWSD), General Administration Department (GAD), Ministry of Home, Yangon City Development Committee (YCDC), Department of Human Settlements and Housing Development (DHSHD) and Public Works (PW), Ministry of Construction.

Rural water supply : Rural Water Supply Division (RWSD), Agricultural Mechanization Department (AMD), Ministry of Agriculture.

Urban sanitation : Yangon City Development Committee (YCDC), Township Development Committee (TDC), General Administration Department, Ministry of Home, Department of Human Settlements and Housing Development and Public Works, Ministry of Construction, Environmental Sanitation Division (ESD), Department of Health (DOH), Ministry of Health.

Rural sanitation : Environmental Sanitation Division, Department of Health, Ministry of Health.

The service coverage in 1980 was estimated to have been 38 per cent for both urban water supply and urban sanitation, 15 per cent for rural water supply as well as for rural sanitation. The targets set were for 50 per cent in each category, but by 1990 the following levels had been reached:

Urban water supply	42 per cent
Urban sanitation	39 per cent
Rural water supply	29 per cent
Rural sanitation	34 per cent

Despite the fact that the targets were not reached, the achievements are important considering that the total population increased from 34 million in 1980 to 40.9 million in 1990, of which over 75 per cent is rural. During the Decade period, the number of persons

served with water supply in urban areas increased from 3 million to 4.2 million, and in rural areas from 4 million to 9 million.

Table 1 shows coverage of populations achieved and targets for the future. Table 2 shows the projected population and acceleration required to meet the targets. Figures 1 and 2 provide a graphic presentation of coverages and targets.

Among indices on which the Decade improvements have had an effect may be considered the average life expectancy at birth, which was 58 years in 1980 and went up to 64.7 years for females and 60.5 years for males in 1990. In the same period, infant mortality rates fell from 56 (deaths per 1000 live births) to 47.1, and the incidence of water-borne diseases fell from 1,488 cases (per 100,000 people) to 600.

With assistance from UNICEF and Australia (ADAB), RWSD provided over 3,000 new tubewells in the Dry Zone, gravity flow piped systems were introduced, piped systems were installed to grouped villages, and some solar energy pumps were provided in rural areas. In addition to improvements in Yangon and Mandalay Metropolitan Regions, urban projects were supported by JICA, AsDB, UNDP/WHO and OPEC.

7.2 TARGETS FOR THE YEAR 2000

The following targets have been set according to the National programme of Action for Survival, Protection and Development of Children in Myanmar for the year 2000:

Urban water supply	100% coverage
Urban sanitation	100% coverage
Rural water supply	95.6% coverage
Rural sanitation	95.6% coverage

7.3 AREAS OF ACTION IN THE 1990s

In order to meet the changing circumstances, the plans and strategies developed at the beginning of the Decade require to be updated. There is a need for the Government to make a clear commitment with regard to sector development, its policies and strategies and the manner in which water supply and sanitation planning is to be integrated with plans for urban and rural development, land and water resources management, and environmental protection. The reactivation of the Water Committee, established in 1983 and the broadening of its responsibilities to include sanitation activities, or the establishment of a single, authoritative National Water and Sanitation Authority, as has been suggested, should receive serious consideration.

The following areas of action have been proposed so as to respond to related constraints:

(1) Sector Priority

Although equivalent targets were set for all the four sub-sectors, attaching equal priority, the allocation of external funds to urban areas in preference to rural areas and

to water supply over sanitation has upset the priority setting. Efforts will be made to redress this imbalance and to apply an approach which will integrate actions in all sub-sectors within local authority development plans.

(2) Financial Resources

There is, at present, no clearly stated national financial policy concerning water supply and sanitation. Schemes and local authorities are not obliged to levy charges to cover operating costs, allow for depreciation, earn a rate of return on net assets or make the system financially self-supporting. The Government will therefore evolve an explicit policy of providing capital grants to local authorities which are willing to implement approved water supply and sanitation projects as an incentive for mobilizing the resources available in their communities. Measures are to be taken to make more effective use of available financial resources, recognizing cost-recovery strategies as an important factor in the sustainability of the sector.

(3) Sectoral Planning

Planning of sector programmes will be better coordinated through a central responsible unit which could act as the secretariat of the Water Committee. The national plan will take into consideration the available internal and external resources, both financial and material, and will be better placed to seek additional funding for both coverage and support programmes.

(4) Infrastructure

An assessment of the existing institutional capacity and its effectiveness will be undertaken. It is foreseen that responsible institutions will need to be strengthened and reorganized in order to carry out successfully the substantial work required in the coming decade.

(5) Transport and Logistics

Efforts will be made to acquire funds to increase and improve the transport available for personnel, supplies and equipment. Shortages in this regard act as a constraint in the acceleration of the programme. Logistic support, particularly in respect of transportation, will be improved.

(6) Private Sector Involvement

The participation of the private sector in the development of water supply and sanitation will be explored, particularly in respect of supporting industries to produce locally the materials and equipment required for the sector. A policy will be developed for this privatization and private entrepreneurs will be given encouragement in this regard.

(7) Interagency Coordination

Future activities will require better coordination of the activities of the different agencies involved with the various sub-sectors of the water supply and sanitation programme. Complementary work plans to maximize health and other benefits will be formulated. In addition, sector plans will be coordinated with those of other sectors, especially those related to primary health care, urban and rural development, education, protection of urban and groundwater quality and disposal of liquid wastes from industries and municipalities.

(8) Information System

Measures will be taken to review the existing information and monitoring system and to formulate a programme for national sector management information to assist in the future planning of cost-effective programmes in both capital investment and operation and maintenance.

(9) Health Education

Attempts will be made to match the health education inputs on environmental sanitation and personal hygiene with the ongoing water supply and sanitation activities through a complementary work plan. NGOs and social groups will be involved and rational and innovative communication technology will be used to promote awareness among women's groups and communities in general.

7.4 FOCUS OF WHO SUPPORT

The Organization will strive to promote active collaboration between national agencies and ESAs in sector development. During the 1990s, support from WHO will focus on cooperation in the following:

- sector development planning;
- institutional and manpower development;
- the development of a sector management information system;
- the development and implementation of appropriate technologies;
- the development of hygiene and health education as a component of water supply and sanitation activities,
- community-based programmes involving women in the development process and NGOs, and
- water quality surveillance and control, including strengthening of the operation and maintenance system.

Table 1 : WATER SUPPLY & SANITATION

COVERAGE & TARGETS
(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995***		2000***	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	6	2	7	3	8	3	9	3 2	9.9	4 2	10 62	5.54	11.85	11 85
Urban Sanitation	6	3	7	3	8	3	9	2.9	9.9	3.9	10.62	5.69	11.85	11 85
Rural Water Supply	22	3	24	3	26	4	28	6.8	31	9	33.65	17.54	37.58	35 93
Rural Sanitation	22	3	24	3	26	4	28	5.8	31	10.6	33.65	16.90	37.58	35.93

Pop = Total Population
Cov. = Population covered
* = IDWSSD Commencement Report
** = IDWSSD Evaluation in SEAR
*** = National Programme of Action for Survival, Protection and Development of Children in Myanmar

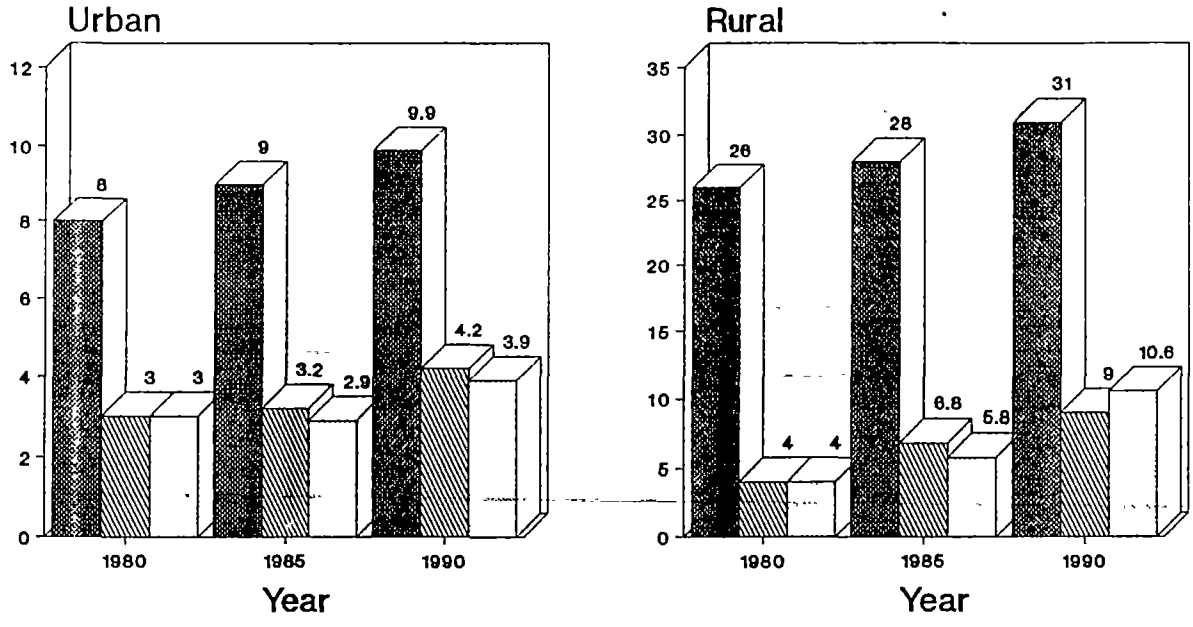
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	4.2	1.2	11.85	5.4	46	11.85	100	7.65	6.37
Urban Sanitation	3.9	0.9	11.85	4.8	41	11.85	100	7.95	8.83
Rural Water Supply	9.0	5.0	37.58	14.0	37	35.93	95	26.93	5.39
Rural Sanitation	10.6	6.6	37.58	17.2	46	35.93	95	25.33	3.84

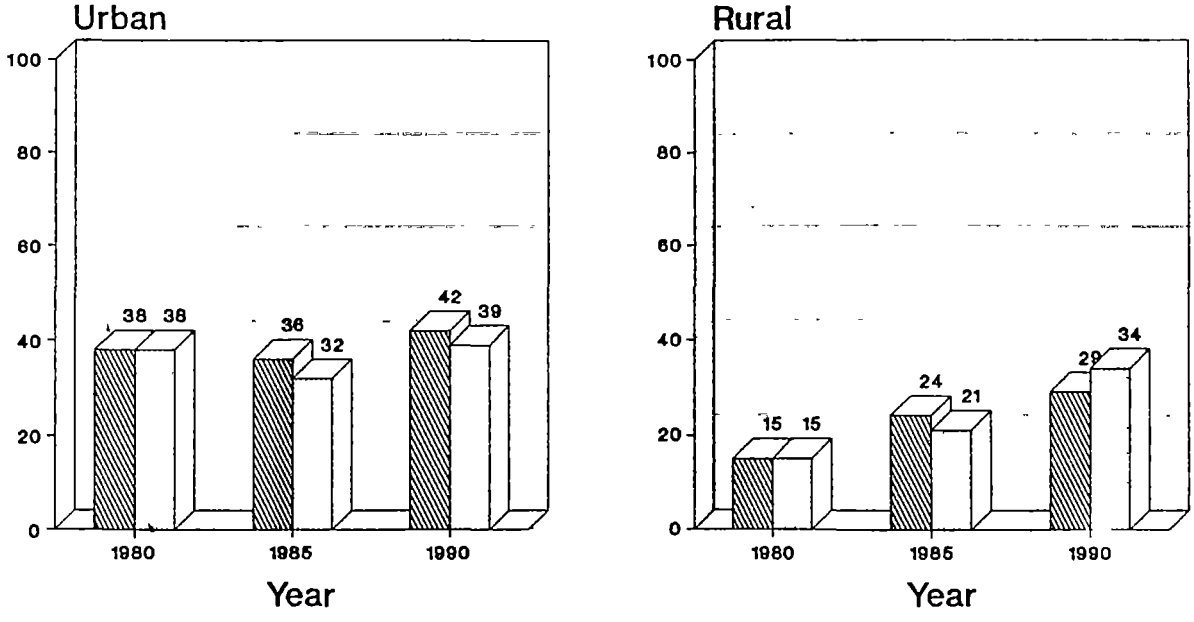
Figure 1

DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



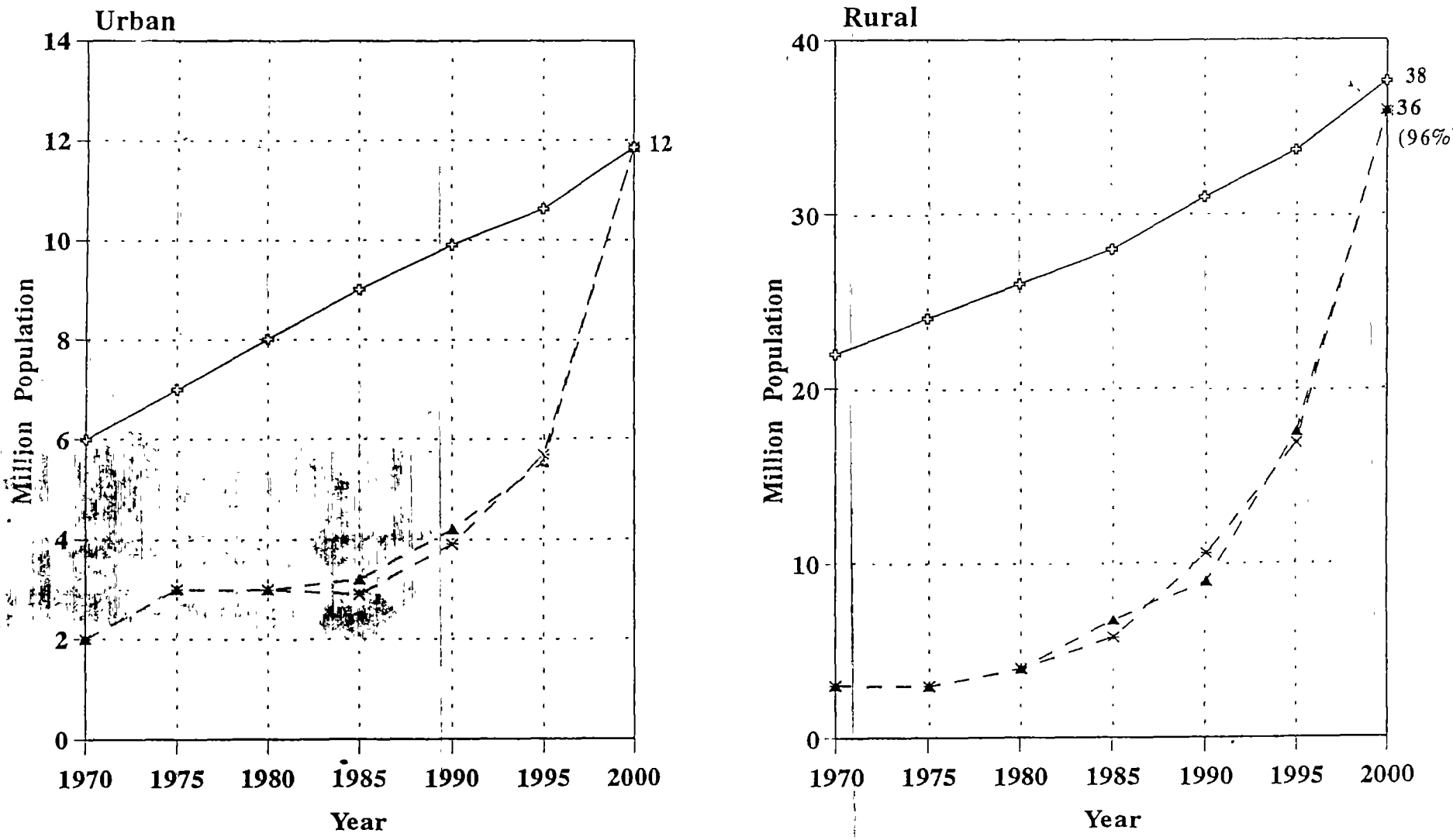
% of Population



MYANMAR

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



8. NEPAL

8.1 DECADE ACHIEVEMENTS

In 1981, the Government of Nepal formulated a sector plan for the Decade which proposed the following service coverage targets to be reached by 1990:

Urban water supply	94 per cent
Urban sanitation	21.7 per cent
Rural water supply	67 per cent
Rural sanitation	13.4 per cent

The plan also proposed programmes for meeting these coverage targets and elaborated policies and priorities for community responsibility, technology selection, training of technical manpower, and institutional improvements.

Prior to 1988, sector responsibility was primarily with the Ministry of Water Resources in the Department of Water Supply and Sewerage (DWSS) and with the Ministry of Panchayat and Local Development (MPLD). Since 1988, when the Ministry of Housing and Physical Planning (MHPP) was established, the responsibility for sector development and intersectoral coordination among other ministries has been vested in MHPP. DWSS is the lead agency in MHPP for water supply and sanitation. The Nepal Water Supply Corporation (NWSC), which replaced WSSC in 1989, is also in MHPP. The Ministry of Local Development (MLD), which replaced MPLD, is involved in water supply and sanitation activities in village development programmes and in the rural women's development programme.

Several group activities were conducted during the Decade, including:

- WEDC course for engineers on water supply and sanitation for IDWSSD, and national seminar on environmental sanitation, August-September 1981;
- Decade orientation and review workshop, August 1983;
- Mid-Decade review by Task Force group, July-August 1985;
- Preparation of Nepal Resource Mobilization Profile, April 1986;
- Sector donors' meeting, April 1986;
- Workshop on Planning and Implementation Procedures for Water Supply and Sanitation Projects, August 1986;
- National Seminar on Drinking Water Quality, June 1988;

- Donors' meeting for Nepal Water Supply Corporation (NWSC), November 1988;
- National Workshop on Sanitation (Human Excreta Disposal), January 1989;
- Formation of the National Water Supply and Sanitation Committee (NWSSC) by Cabinet decision, September 1990;
- Sector review and formulation of sector programmes up to 2000, October 1990 - April 1991.
- National Consultation on Sanitation (Policy Formulation), September 1991.

Coverage targets were revised in the mid-Decade review to 69 per cent and 20 per cent for urban water supply and urban sanitation, and to 52 per cent and 1.2 per cent for rural water supply and rural sanitation respectively. The corresponding coverage percentages at the end of the Decade were estimated as 67 per cent, 33 per cent, 34 per cent and 3 per cent respectively. It is stated that the sanitation coverage figures should be taken as indicative only, but, nevertheless, they show substantial progress in excess of the targeted levels. The situation in urban areas is affected by the burden of rapid urbanization in most of the 36 municipalities; the supply is only intermittent. Treatment other than chlorination, which is applied in all cases, is confined to a few cities and ground water often contains high iron, manganese and ammonia content. Only the core areas of the three cities of Kathmandu Valley benefit from sanitary sewerage; coverage in the municipalities is still relatively low.

Table 1 shows coverage of populations achieved and targets for the future. Table 2 shows the projected population and acceleration required to meet the targets. Figures 1 and 2 provide a graphic presentation of coverages and targets.

Sector investment during the Decade amounted to a total of about NRs.3 400 million (about US$ 115 million), of which 40 per cent was from external sources.

8.2 TARGETS FOR THE YEAR 2000

His Majesty's Government of Nepal is committed to the provision of universal access to the safe supply of drinking water as well as to the achievement of Health for all by the year 2000. The national targets for the water supply and sanitation sector established to reach the above goals are as follows:

Urban water supply	100% coverage
Urban sanitation	100% coverage
Rural water supply	80% coverage
Rural sanitation	30% coverage

These targets have been built into the Eighth and Ninth National Five-Year Development Plans, 1992-1997 and 1997-2002.

8.3 AREAS OF ACTION IN THE 1990s

The evolution of the Decade and the lessons learned have proved beneficial in defining the approaches for future sector development. The two aspects on which it will now be necessary to concentrate are:

- Provision of adequate and locally sustainable water supplies and sanitation facilities, with particular emphasis on the lower income groups, and

- Improved personal, household and community hygiene practices through an accelerated low-cost sanitation programme and health education.

The following areas of action have been identified for implementation in the 1990s to overcome the related constraints:

(1) Institutional Restructuring

In order to establish a more effective framework for the implementation of the decentralized sector programmes, and to avoid fragmentation of activities and poor coordination, which were features of the early part of the Decade, restructuring of some government departments will be necessary. This has, to some extent, been dealt with by the transfer of responsibility for this sub-sector to the Ministry of Housing and Physical Planning in 1988.

(2) Sector District Development Plans

Dynamic plans will be prepared and implemented annually, based on an inventory of potential projects duly prioritized according to objective criteria.

(3) Human Resources Development

Activities for training and human resources development will be directed to the development of the required numbers of new and redeployed staff capable of implementing the decentralized programme at district and regional levels.

(4) Integrated Projects

Projects will be implemented with a view to providing complementary inputs to water supplies, environmental sanitation, health education and better linkage with the primary health care programme.

(5) Community Participation

Efforts will be made to maximize community participation in all aspects of project implementation to ensure that the benefiting communities are willing and able to undertake operation and maintenance of the systems on a sustained basis. In particular, action will be taken to involve the women of the communities fully at all levels and stages of sector programmes.

(6) Programme Consolidation

The initial focus will be on consolidation of the programme through completion of ongoing schemes and the rehabilitation of existing schemes in need of repair or improvements to ensure that they provide the required level of service so that they can be handed over to Users' Committees. The rehabilitation of existing system had been identified as a priority.

(7) Private Sector's Role

The role of the private sector and of NGOs will be enhanced in the implementation of coordinated sector district development plans.

(8) Legislation and Enforcement

Steps will be taken to improve legislation and its enforcement relating to control and protection of drinking water and water sources, maintenance of appropriate environmental sanitation standards, including water pollution control, establishment of water quality standards, and water quality monitoring and surveillance.

(9) Point Source Water Quality Protection

Programmes of point source protection will be developed using material inputs from the implementing agencies and the major contribution from the beneficiaries in those small communities where locally available traditional sources can be tapped.

(10) Coordination

Donor and government coordination will be strengthened by ensuring both intra- and intersectoral cooperation in order to make the most equitable and efficient distribution of limited resources in accordance with the needs of the sector district development plans. The NWSSC, recently reconstituted, will play a more dynamic role as the coordinating body for the sector. Technical cooperation for software components of the programme will be sought from external support agencies and NGOs.

8.4 FOCUS OF WHO SUPPORT

The Organization will continue to promote greater collaboration among the national agencies and external support agencies active in the sector. WHO support in the 1990s will include cooperation in the following:

- institutional strengthening for sector development;
- human resources development, particularly at the local government level;
- improved surveillance and control of water quality;
- promotion of hygiene education and community involvement, particularly of women for increased sanitation coverage, and
- development of a management information system for sector monitoring and evaluation.

Table 1 : WATER SUPPLY & SANITATION

COVERAGE & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995		2000***	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	0.4	0.21	0.53	0.45	0.86	0.71	1.35	1.0	1.8	1.2	2.5	2.06	2.92	2.92
Urban Sanitation	0.4	0.06	0.53	0.07	0.86	0.14	1.35	0.23	1.8	0.6	2.5	1.47	2.92	2.34
Rural Water Supply	11	0.01	12	0.542	13	0.862	15.3	3.8	17.1	5.8	18.6	13.08	20.37	20.37
Rural Sanitation	11	0	12	0	13	0.15	15.3	0.26	17.1	0.5	18.6	3.0	20.37	6.11

Pop. = Total Population
Cov. = Population covered
* = IDWSSD Commencement Report
** = Evaluation of IDWSSD in SEAR (1991)
*** = Based on country report

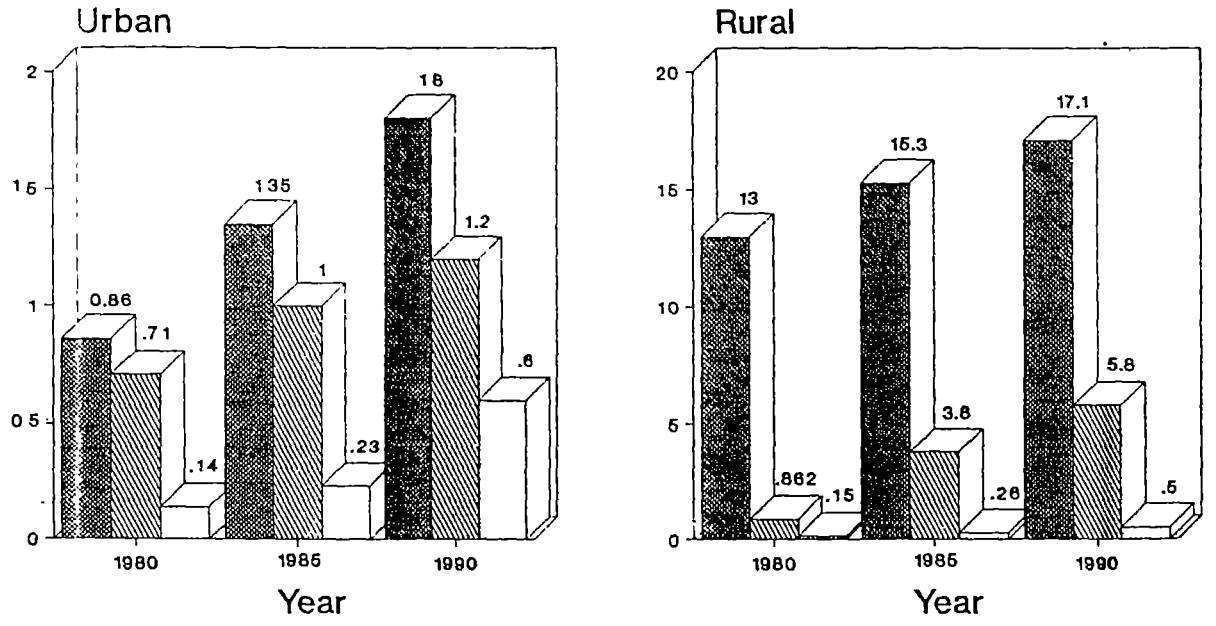
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	1.2	0.49	2.92	1.69	58	2.92	100	1.72	3.51
Urban Sanitation	0 6	0.46	2.92	1.06	36	2.34	80	1.74	3 78
Rural Water Supply	5.8	4.94	20.37	10.74	53	20.37	100	14.57	2 95
Rural Sanitation	0 5	0.35	20.37	0.85	4.2	6.11	30	5 61	16 02

Figure 1

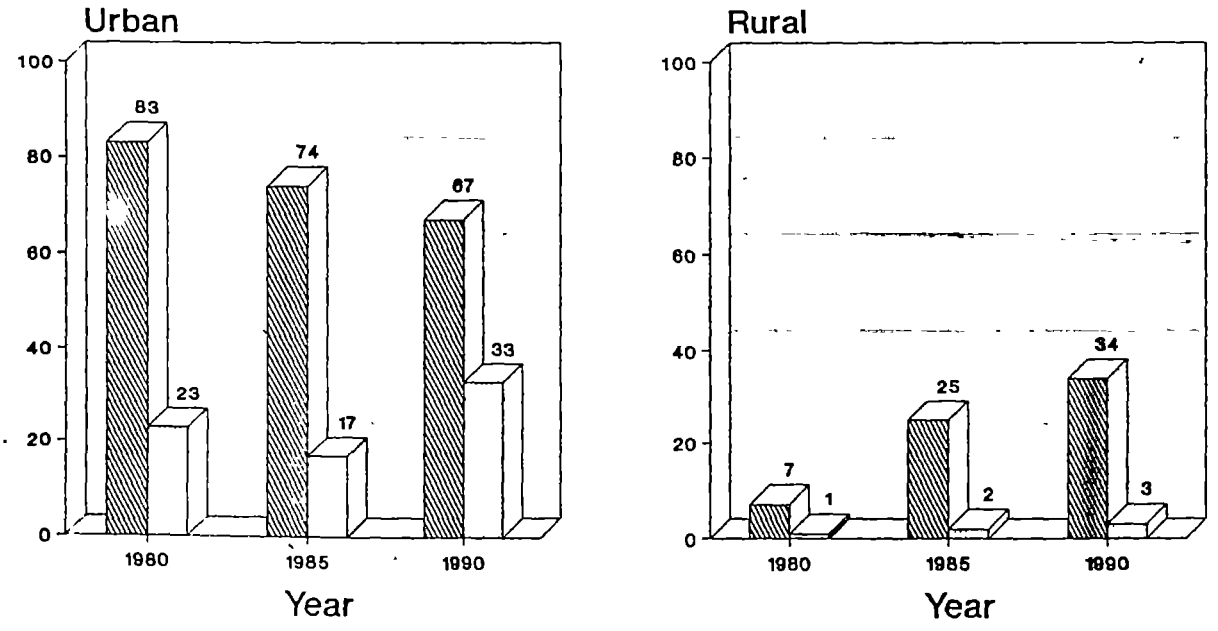
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In Millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

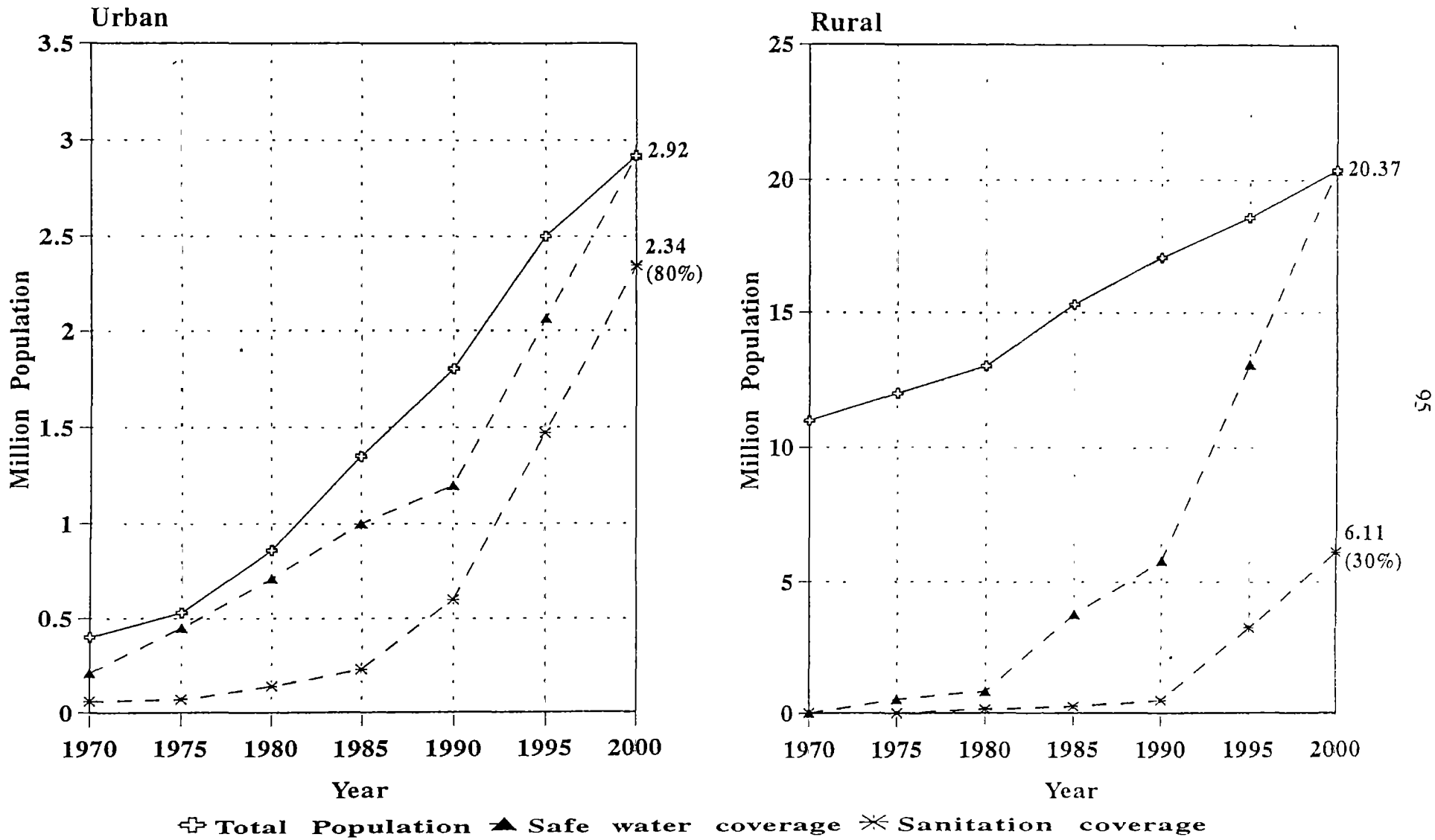
% of Population



NEPAL

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



9. SRI LANKA

9.1 DECADE ACHIEVEMENTS

During the Decade, the main sector implementing agency, the National Water Supply and Drainage Board (NWSDB), has undergone a major institutional change, which has transformed the character of the organization from being capital project-oriented to become a more commercial operation and a consumer service agency. This has involved regional decentralization, creation of community participation units, increased emphasis on rehabilitation and major financial reforms. By the end of the Decade the national tariff for piped water supply systems had been increased and annual operating costs were being recovered for the first time from consumer collections.

Based on a review of the service coverage in the water supply and sanitation sector at the start of the Decade, the goals for IDWSSD, adopted in 1981, were 100 per cent coverage for urban water supply and for urban and rural sanitation, and 50 per cent coverage for rural water supply. In 1980, the water supply coverage had been estimated as 50 per cent in the urban sector and 56 per cent in the rural sector, and sanitation coverage as 67 per cent and 40 per cent respectively.

By 1990, service coverage had increased, but, except in respect of rural water supply, where the target had been set unreasonably low, it fell short of Decade goals. The achievement in urban water supply was 86 per cent, in urban sanitation 81 per cent, in rural water supply 64 per cent and in rural sanitation 70 per cent. Water supply coverage was defined as piped supply or standposts in the urban sector, and piped supply, standposts, handpump or protected open well in the rural sector. Sanitation coverage was defined as cistern-flush toilet connected to a sewerage system or septic tank, pour-flush or dry pit latrine.

Table 1 shows the coverage of population achieved and targets for the future. Table 2 shows the projected population and acceleration required to meet the targets. Figures 1 and 2 provide a graphic presentation of coverages and targets.

Progress in coverage in the Decade was at a much higher rate than in previous years and can be considered to be satisfactory, particularly in view of the unprecedented long-lasting civil strife and social upheaval which have afflicted the country with consequent adverse impact on the economy. The reasons for not reaching all sector goals include the fact that financial resources averaged only slightly more than half of the planned levels, inflation rates rose dramatically during the Decade, and projected implementation rates, particularly in the sanitation sector, were unrealistically higher than the historic rates.

The Decade Plan had proposed piped sewerage schemes outside Greater Colombo, but these were not implemented owing to the high connection costs, and it was

concluded that alternative low-cost sanitation options would have to be used for most urban areas. The plan to cover all open wells and provide them with handpumps was also found to be unrealistic in terms of local cultural perceptions. It must be accepted that protected open shallow wells will continue to be the main source of water supply in the rural sector. Thus, while the figures quoted are for gross quantitative coverage, there must be some reservations as to the quality aspects in some situations.

9.2 TARGETS FOR THE YEAR 2000

The Government's goals for the year 2000 are for 100 per cent coverage in all sub-sectors. It is believed that the required implementation rate for new piped water supply facilities, equivalent to 170 000 population served per year, compared to the rate of 128 000 per year in the urban sector alone achieved in the 1980s, is physically attainable. New wells will be required at the rate of 39 000 per year, and this should be possible since the construction rate has been about 37 000 per year in the past.

An analysis of coverage requirements over the next decade shows that emphasis must be placed on the rural sector, particularly through the provision of protected open wells for water supply and single-family latrines for excreta disposal.

9.3 AREAS OF ACTION IN THE 1990s

The two most critical constraints identified during the implementation of the Decade Plan have been the poor quality of the database and the national attitude towards paying for water. Considerable difficulties were encountered in deriving meaningful data in terms of both quality and quantity not only on service coverage but also on capital, operation and maintenance costs. The tradition of water being supplied at little or no cost to the user caused problems since the substantial increase in capital investment necessary to meet the Decade goals required subsidies to be lowered and both the Government and users to be educated to appreciate the fact that water is not a cost-free commodity. The following are specific areas where action will be taken in promoting this strategy to overcome the related constraints/issues:

(1) Sector Imbalance

There has been a dichotomy between the perceived areas of priority need and the emphasis given to capital investment through formal sector implementing agencies. Thus NWSDB is responsible for 90 per cent of the total annual sector investment; yet it serves only 20 per cent of the population with water supply facilities and a negligible proportion in the case of basic sanitation facilities. To remove this imbalance, the demand among rural consumers for improved facilities will be stimulated through public awareness campaigns, health education programmes and social marketing techniques.

(2) Database

NWSDB should be clearly established as the national sector coordinating agency for strategy implementation and, as such, should be made responsible for setting up and managing a continuously updated database. To this end, a computerized system of sector

information management will be established to enable decision makers to evaluate priorities, control expenditure, monitor progress towards achievement of the goals and maintain regular liaison among the formal and informal agencies involved in the sector.

(3) Financial Resources

While the requirements to reach total coverage by the year 2000 have been calculated as Rs. 1201 million per year (approx. US$ 30 m) for water supply and Rs. 1028 million per year (US$ 25 m) for sanitation, it is not expected that the Government or external support agencies would contribute the total. The cost of protected open wells and the major part of the cost of pour-flush latrines will be borne by the user, particularly if rural credit facilities are made available and the demand for upgraded systems is stimulated through user education campaigns. It is estimated that external financing might not exceed Rs. 658 million per year in the water supply sector and Rs. 300 million per year in the sanitation sector. These sums are within the available resources.

(4) Community Management

NWSDB has adopted the concepts of decentralization and delegation of authority, which are key components of government policy. This policy will be used to stimulate user involvement in project implementation and encourage the acceleration of the development of community management of sector facilities. The focus should be on hygiene and sanitation promotion and protection of surface and groundwater sources from polution, both industrial and municipal.

(5) Consumer Demand

Consumer demand will be stimulated in the rural and peri-urban low-income sectors through carefully managed public awareness campaigns, by providing credit facilities as necessary for the construction of protected open wells and latrines, by distributing technical guidelines and by training local craftsmen, where required.

9.4 THE FOCUS OF WHO SUPPORT

Support from WHO in the 1990s will include cooperation in the following:

- the development and utilization of appropriate technology for water supply and treatment, and for environmental sanitation;
- strengthening of the capacity of water quality laboratories;
- strengthening of the management information system;
- development of human resources at different levels;
- institutional development, and

continued implementation of the community participation approach, including involvement of women.

Table 1 : WATER SUPPLY & SANITATION

COVERAGES & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995***		2000	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	3	1.3	3	1.2	3	1.5	3.4	2.8	3.7	3.2	3.85	3.6	4.0	4.0
Urban Sanitation	3	2.1	3	2.5	3	2.0	3.4	2.2	3.7	3.0	3.85	3.5	4.0	4.0
Rural Water Supply	10	1.4	10	1.4	11.6	6.5	12.6	7.6	14.0	9.0	14.5	12.0	15.1	15.1
Rural Sanitation	10	6.6	10	5.8	11.6	4.6	12.6	7.1	14.0	9.8	14.5	12.40	15.1	15.1

Pop. = Total Population
Cov. = Population covered
* = IDWSSD Commencement Report
** = IDWSSD Country Evaluation Report
*** = Interpolation between 1990 & 2000

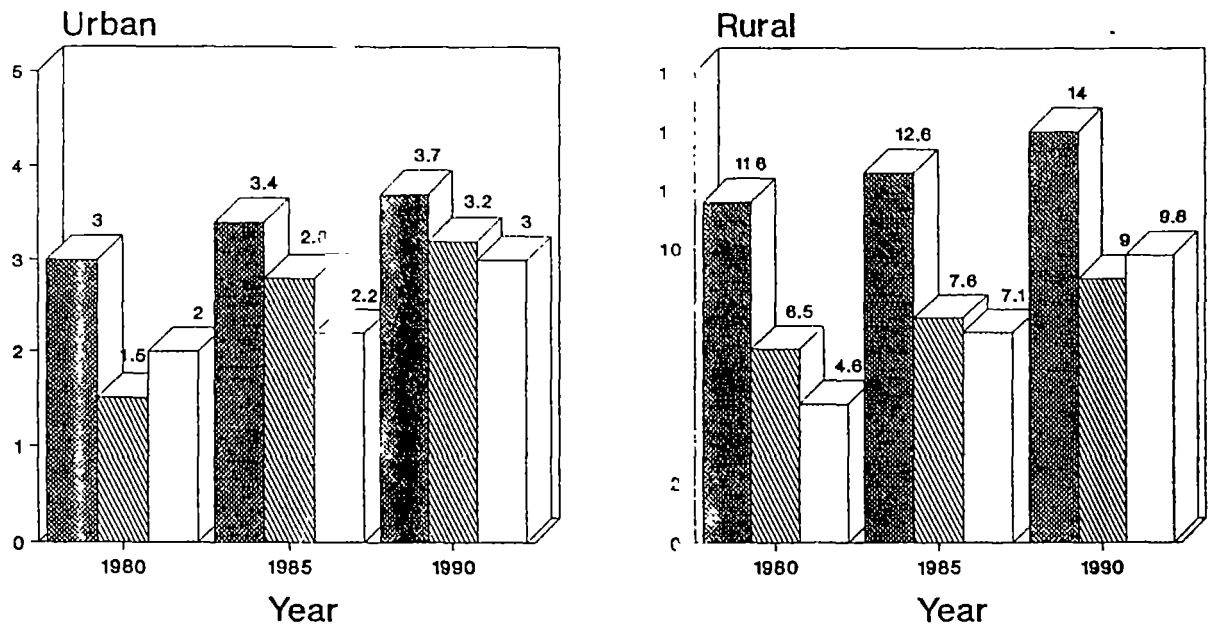
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	3.2	1.7	4.0	4.0	100	4.0	100	1.2	-
Urban Sanitation	3.0	0.0	4.0	NA	--	4.0	100	1 5	-
Rural Water Supply	9.0	2.5	15.1	15.1	100	15 1	100	6.1	2 4
Rural Sanitation	9.8	6.2	15.1	8.4	56	15.1	100	7 2	1 2

Figure 1

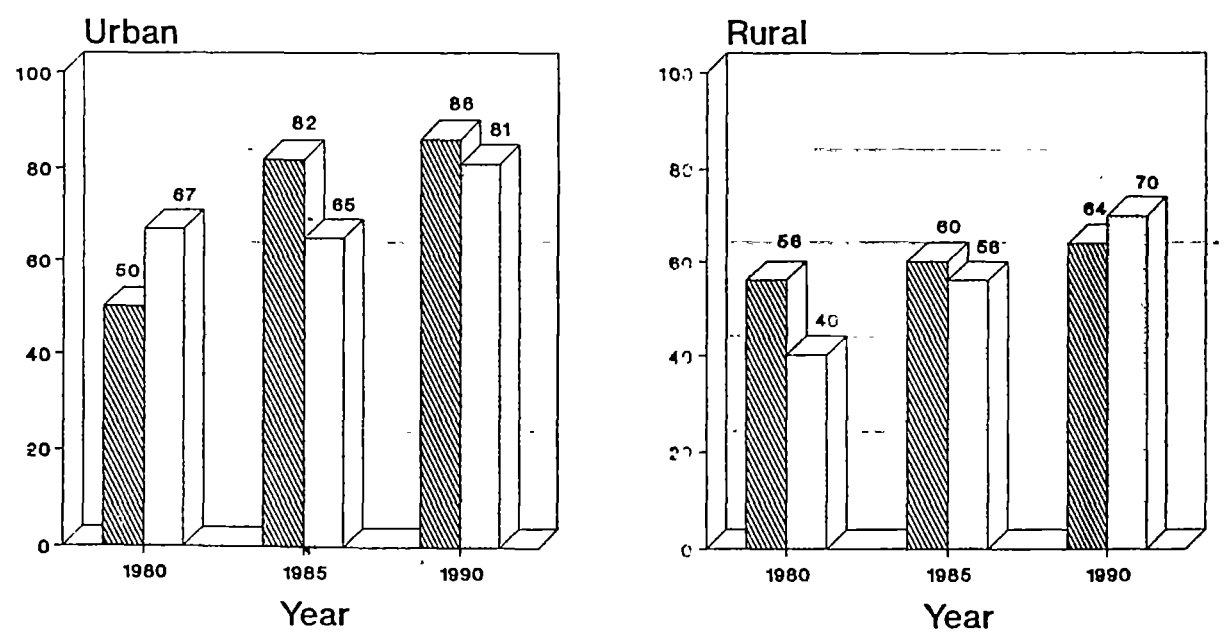
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In Millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

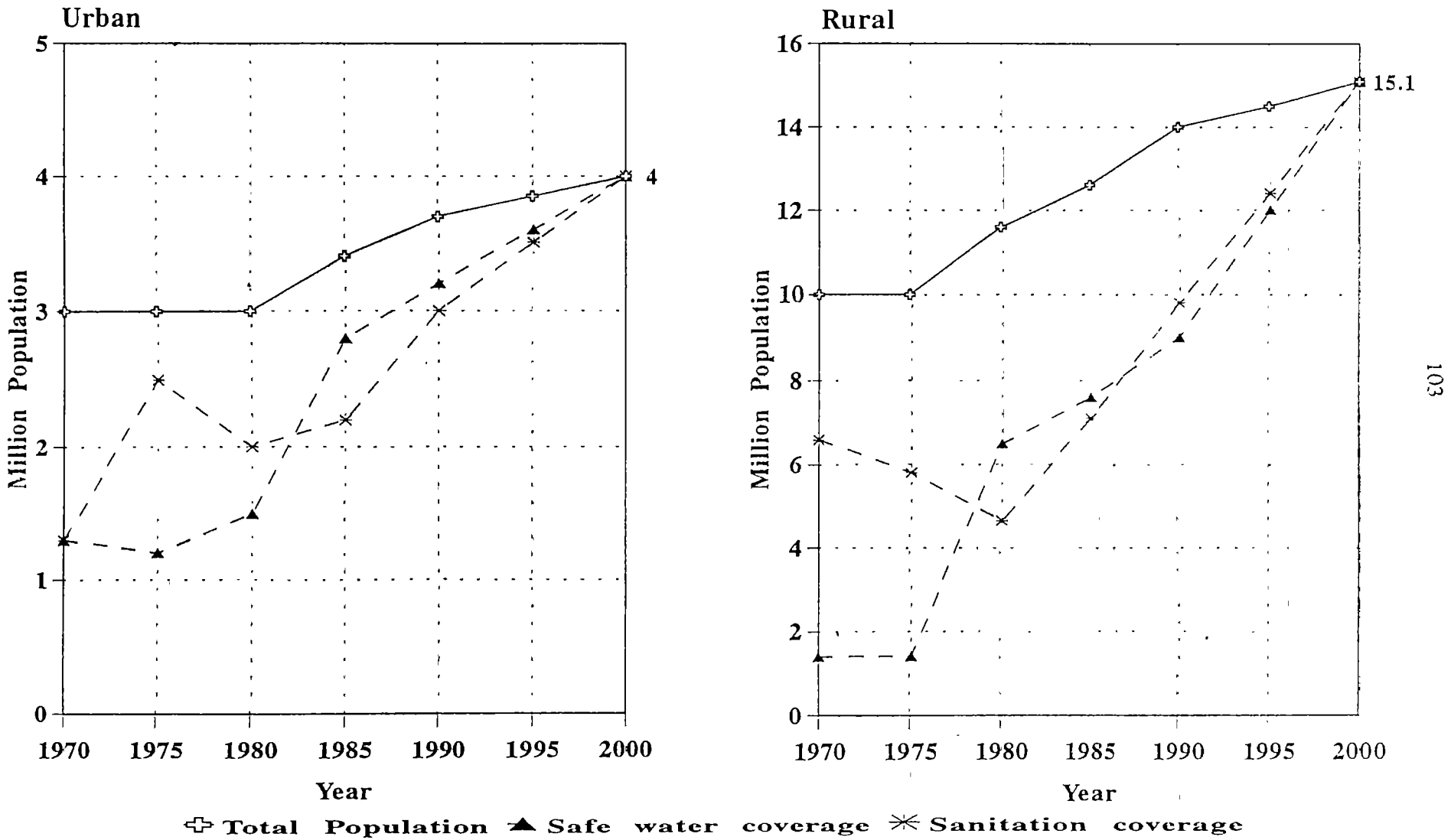
% of Population



SRI LANKA

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS



10. THAILAND

10.1 DECADE ACHIEVEMENTS

The responsibility for the sector is complicated by its fragmentation among a total of 31 agencies from eight ministries. Only ten play a major role, and three of these account for the bulk of Decade inputs and activities. Urban piped water supply is the responsibility of the Provincial Waterworks Authority and Metropolitan Waterworks Authority (PWA/MWA) as well as of the Public Works Department (PWD), both in the Ministry of Interior. PWA and PWD also have a role in providing piped supplies in rural areas although the provision of point source supplies is mainly a responsibility of the Department of Health (DOH), Ministry of Health. Urban sanitation also comes under PWD but, again, on-site sanitation is looked after by DOH.

The targets which were set in 1981 for service coverage by the end of the Decade were 71 per cent for both urban water supply and urban sanitation, 95 per cent for rural water supply and 51 per cent for rural sanitation. The estimations for existing coverage at the beginning of the Decade were 65 per cent for urban water supply and 64 per cent for urban sanitation, 40 per cent for rural water supply and 41 per cent for rural sanitation.

PWD reports having drilled 11,658 deep wells during the Decade on its own projects plus over 1200 deep wells for other agency projects. It has also drilled 3,918 less deep water wells for rural communities using simplified equipment. Handpumps have been fitted to 14,117 wells and motorized pumps to 417. PWD had also planned to expand and improve the efficiency of wastewater treatment and wastes disposal in 26 urban centres, and work is proceeding on these.

MWA has been successful in reducing non-revenue water from 48 per cent in 1981 to 33 per cent in 1989 by meter and pipe replacement and the establishment of a Water Loss Reduction Office mandated to detect leakage, improve metering efficiency, trace illegal connections and improve the control of distribution systems. By 1990, PWA had been operating 215 waterworks in 99 municipalities and 237 sanitary districts serving a population of 8.5 million, compared to an estimated population of only 3.9 million served in 1981 - an increase in coverage of from 38 per cent to 63 per cent.

DOH has estimated that at the end of 1990, out of a total of 9.65 million households in rural areas, 7.22 million were served with safe drinking water supply and 7.14 million with adequate sanitation facilities. Infant mortality rates per 1000 live births fell from 12.5 in 1981 to 9.3 in 1988, and maternal mortality rates from 0.8 to 0.3. In the period 1980 to 1990, life expectancy at birth rose from 58.63 to 61.75 for males and from 65.50 to 67.50 for females. DOH attributes these improvements, at least in part, to improved water supply and sanitation facilities.

Combining the reports received from these three agencies, the estimated service coverage levels at the end of the Decade are:

Urban water supply	75 per cent
Urban sanitation	96 per cent
Rural water supply	87 per cent
Rural sanitation	71 per cent.

Table 1 shows the coverage of the population achieved and targets for the future Table 2 shows projected population and acceleration required to meet the targets. Figures 1 and 2 provide a graphic presentation of coverages and targets.

With the exception of the rural water supply sub-sector, which shows a slight shortfall, the Decade targets have been achieved.

10.2 TARGETS FOR THE YEAR 2000

The water supply and sanitation sector is well on the way to achieving universal coverage of the population, both urban and rural, without requiring any significant acceleration. The projected coverage is therefore shown as 100% for water supply as well as sanitation.

10.3 AREAS OF ACTION IN THE 1990s

In considering the strategies and approaches which must be adopted in the 1990s for increasing the coverage and quality of service, the following areas of action have been identified to overcome the related constraints:

(1) Community Participation

Increased attention will be paid to the mobilization of community participation, particularly of women, in project development. Village volunteers will be trained to take responsibility for the operation and maintenance of installed facilities, and local institutions will be established.

(2) Intersectoral Collaboration

Efforts will be made to improve collaboration and coordination, not only between implementing agencies but also with other government departments, such as those responsible for primary health care, health and hygiene education and agriculture, and with nongovernmental organizations active in the sector.

(3) Improvement of Planning and Management

The national systems of planning, implementation, monitoring and evaluation will be strengthened and efforts made to establish a sector management information system for data processing, storage, retrieval and reporting purposes.

(4) Human Resources Development

Training of the required manpower will be carried out at different levels to increase the capacity of the implementing agencies to plan, construct, operate and maintain facilities and to improve water quality control.

(5) Research and Development

Research will be promoted in such areas as appropriate technology for community-based systems, environmental impact assessment, removal of chemical contaminants from ground water, health economics, and administration and management of rural and small urban systems.

(6) Social Welfare

Subsidies will be provided to low-income groups of the population to enable them to participate in cost-sharing schemes of private latrine construction and village improvement.

10.4 FOCUS OF WHO SUPPORT

WHO's support to the programme at country level is under the Control of Environmental Hazards Project and Primary Health Care activities, and will include cooperation in the following:

- the development of community participation in project development and community management of facilities;
- the development of health and hygiene education in water supply and sanitation as part of primary health care;
- the development of a planning and management information system;
- human resources development and training;
- the development of appropriate technology, and
- the development of water quality surveillance and control.

Table 1 : WATER SUPPLY & SANITATION

COVERAGES & TARGETS

(Population in millions)

SUB-SECTOR	Years													
	1970*		1975*		1980*		1985**		1990**		1995***		2000***	
	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.	Pop.	Cov.
Urban Water Supply	5.0	3.0	7.0	4.0	11.0	7.1	12.9	7.0	15.7	11.8	18.1	15.7	20.4	20.4
Urban Sanitation	5.0	3.0	7.0	4.0	11.0	7.1	12.9	10.0	15.7	15.1	18.1	17.7	20.4	20.4
Rural Water Supply	31.0	6.0	36.0	11.0	36.0	14.4	39.0	26.0	40.7	35.4	42.0	39.9	43.3	43.3
Rural Sanitation	31.0	10.0	36.0	13.0	36.0	14.76	39.0	18.0	40.7	28.9	42.0	35.7	43 3	43.3

Pop. = Total Population
Cov. = Population covered
* = IDWSSD Commencement Report
** = IDWSSD Evaluation in SEAR
*** = Extrapolation of previous data

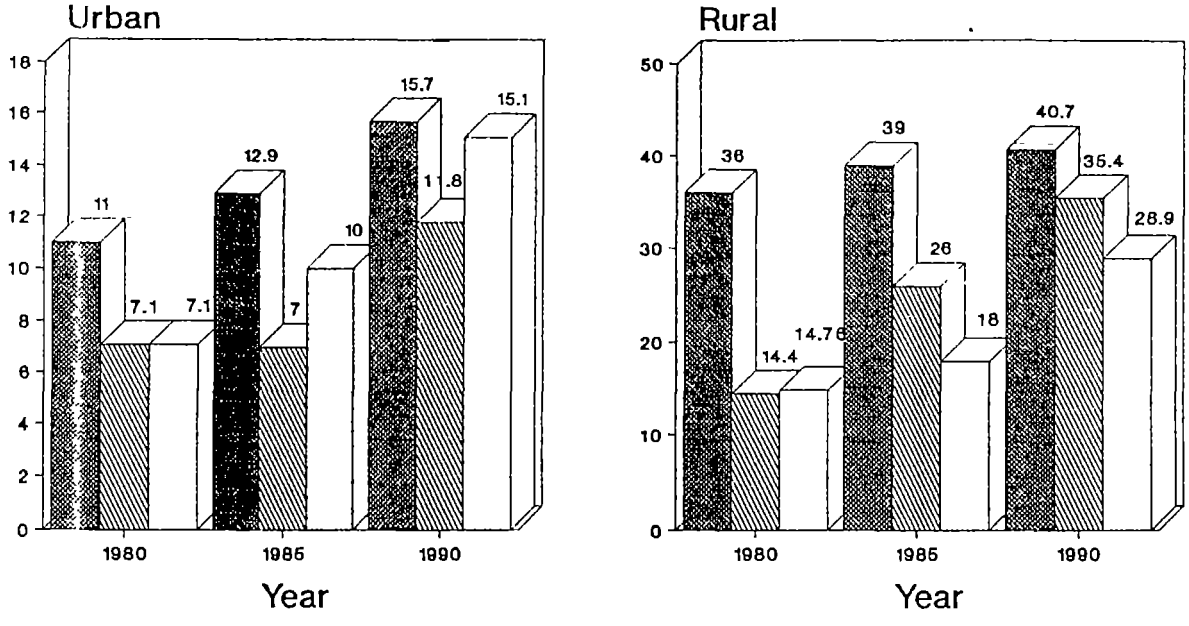
Table 2 : WATER SUPPLY AND SANITATION - PROJECTED POPULATION COVERAGE & TARGETS FOR 2000

Sub-sector	Population Covered (1990)	Additional covered (1980-1990)	Projected Population (2000)	Projected Coverage in 2000 (1985-1990 trend)		Target Coverage (2000)		Targeted Additional coverage (1991-2000)	Acceleration factor required to meet target
	Millions	Millions	Millions	Millions	%	Millions	%	Millions	
1	2	3	4	5	6	7	8	9	10 = (9/3)
Urban Water Supply	11.8	4.7	20.4	16.5	81	20.4	100	8.6	1.7
Urban Sanitation	15.1	8.0	20.4	20.4	100	20.4	100	5.3	0.66
Rural Water Supply	35.4	12.4	43.3	43.3	100	43.3	100	7.9	0.64
Rural Sanitation	28.9	13.9	43.3	42.8	99	39.0	100	10.1	0.73

Figure 1

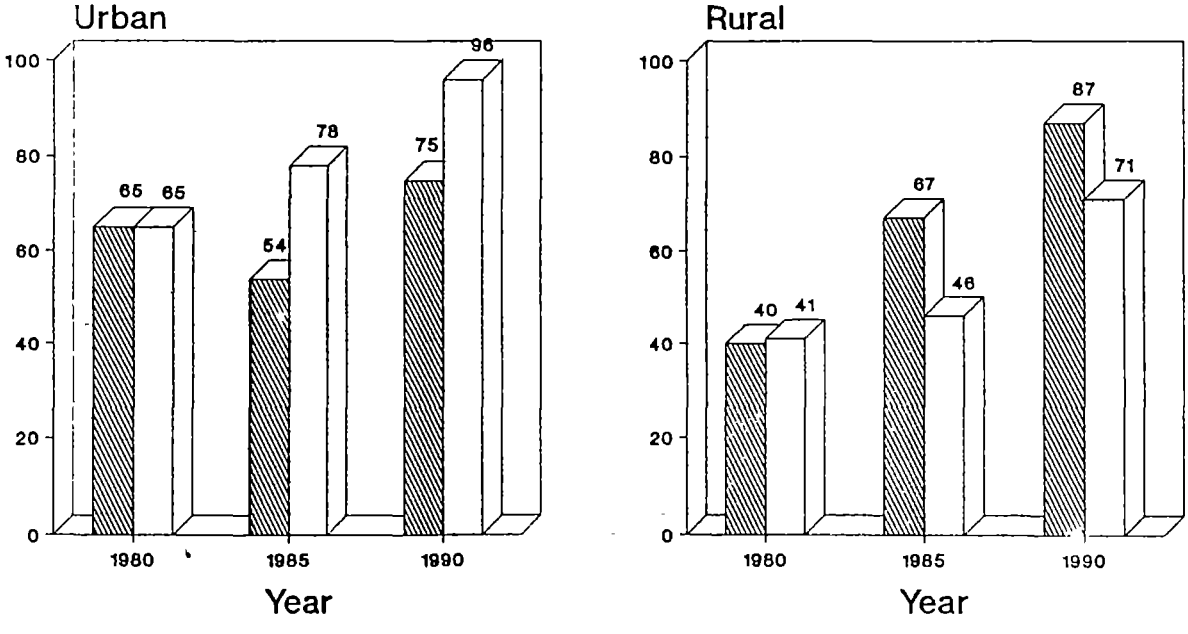
DRINKING WATER SUPPLY & SANITATION COVERAGE, 1980-1990

In millions



Legend : Total Population Water Supply Coverage Sanitation Coverage

% of Population



THAILAND

Figure 2

ACTUAL & PROJECTED POPULATION COVERAGES AND TARGETS